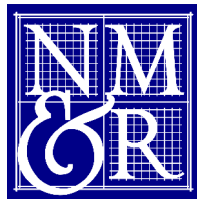


PROJECT MANUAL
INCLUDING SPECIFICATIONS
FOR
CONSTRUCTION
OF THE
**MANZANITA ELEMENTARY SCHOOL
MODERNIZATION**

1240 Manzanita Hills Avenue
Redding, CA 96001

NMR Project No. 18-2877



NICHOLS MELBURG & ROSSETTO

300 Knollcrest Drive
Redding, CA 96002

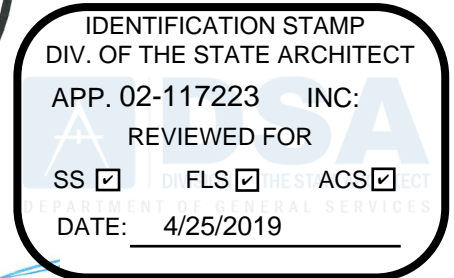
530.222.3300
FAX 222.3538

NOVEMBER 2019

ARCHITECT:

WESLEY KING
License Number: #29216

Nichols, Melburg & Rossetto
300 Knollcrest Drive
Redding, CA 96002
T. (530) 222-3300
F. (530) 222-3538
king@nmrdesign.com



ELECTRICAL ENGINEER:

TONY BOWSER
License Number: #17988

PACE Engineering
1730 South Street
Redding, CA 96001
T. (530) 244-0202
F. (530) 244-1978
tbowser@paceengineering.us



MECHANICAL ENGINEER:

BEN ABRAHAMSEN
License Number: 35923

FRONTIER CONSULTING ENGINEERS
P.O. Box 492174
Redding, CA 96049
T. (530) 232-6160
F. (530) 232-2770
ben@frontierce.com



STRUCTURAL ENGINEER:

JOHN CORLESS
License Number: 4556

NICHOLS, MELBURG & ROSSETTO
300 Knollcrest Drive
Redding, CA 96002
T. (530) 222-3300
F. (530) 222-3538
corless@nmrdesign.com



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Notice is hereby given that Redding School District (hereinafter referred to as "Owner") will receive sealed bids prior to the date and time stated for the Bid Opening for the award of the Contract to construct:

MANZANITA ELEMENTARY SCHOOL MODERNIZATION

as per drawings and specifications which may now be obtained electronically from the Architect:

Nichols, Melburg & Rossetto
300 Knollcrest Dr., Redding, CA 96002
T. 530.222.3300
worley@nrmrdesign.com

The lowest bid shall be determined on the amount of the base bid.

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

Public works projects shall be subject to compliance monitoring and enforcement by the Department of Industrial Relations. For all projects over Twenty-Five Thousand Dollars (\$25,000), a contractor or subcontractor shall not be qualified to submit a bid or to be listed in a bid proposal subject to the requirements of Public Contract Code section 4104 unless currently registered and qualified under Labor Code section 1725.5 to perform public work as defined by Division 2, Part 7, Chapter 1 (§§ 1720 et seq.) of the Labor Code. For all projects over Twenty-Five Thousand Dollars (\$25,000), a contractor or subcontractor shall not be qualified to enter into, or engage in the performance of, any contract of public work (as defined by Division 2, Part 7, Chapter 1 (§§ 1720 et seq.) of the Labor Code) unless currently registered and qualified under Labor Code section 1725.5 to perform public work.

Contract Time shall be Seventy-Five (75) calendar days, and liquidated damages for delay shall accrue. See Agreement Between Owner and Contractor for more information.

Bids must be sealed and filed in the Business Office of the Owner at Redding School District, 5885 East Bonnyview Rd., Redding, CA, 96001 by **May 16, 2019 before 1:30 p.m.** on the clock designated by the Owner or its representative as the bid clock, after which time bids will be opened. No bid will be accepted by Owner after this time. Facsimile (FAX) copies of the bid will not be accepted

A **Non-Mandatory** pre-bid meeting will be held on **May 7, 2019 at 4:00 p.m.** Meet in front office of Manzanita Elementary School, 1240 Manzanita Hills Ave., Redding, CA 96001.

For information about optional pre-bid conferences or site visits, see the Instructions to Bidders.

**SECTION 00 11 13
NOTICE TO BIDDERS**

Bids must be accompanied by a bidder's bond, cashier's check, or certified check for at least ten percent (10%) of the amount of the base bid and made payable to the Owner.

Pursuant to the Contract Documents, the successful bidder will be required to furnish a Payment (Labor and Material) Bond in the amount of one hundred percent (100%) of the Contract Sum, and a Faithful Performance Bond in the amount of one hundred percent (100%) of the Contract Sum, as set forth in the Contract Documents.

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

The Owner will not consider or accept any bids from contractors who are not licensed to do business in the State of California, in accordance with the California Public Contract Code, providing for the licensing of contractors. In accordance with Section 3300 of said Code, the bidder shall have a Class "B" license and shall maintain that license in good standing through Contract completion and all applicable warranty periods. For all projects over Twenty-five Thousand Dollars (\$25,000), bidder shall state the public works contractor registration number on the Designation of Subcontractors form for each subcontractor performing more than one-half of one percent (0.5%) of the bidder's total bid.

The Director of Industrial Relations of the State of California, in the manner provided by law, has ascertained the general prevailing rate of per diem wages and rate for legal holidays and overtime work. The Contractor must pay for any labor therein described or classified in an amount not less than the rates specified. Copies of the required rates are on file at the Owner's business office and are available on request.

Advertise Dates: April 24, 2019
May 1, 2019

INSTRUCTIONS TO BIDDERS
MANZANITA ELEMENTARY SCHOOL MODERNIZATION
REDDING SCHOOL DISTRICT

SECURING DOCUMENTS:

Drawings and Specifications are available electronically from the Architect at:

NICHOLS, MELBURG & ROSSETTO
300 Knollcrest Dr., Redding, CA 96002
king@nmrdesign.com
T. 530.222.3300

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 the bidder lists 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 pre-qualified status with the Owner. Bidders must submit the prequalification application to the Owner no later than ten days prior to the bid date. District will publish list of prequalified contractors and subcontractors no later than five days prior to the bid date. Bidders may obtain the prequalification application from <https://www.qualitybidders.com/>.

RETENTION:

The Owner will withhold retention of 5% from all progress payments.

REGISTRATION:

For all projects over Twenty-Five Thousand Dollars (\$25,000), the Owner shall not accept any bid or enter into any contract without proof of the bidder's current registration to perform public work under Labor Code section 1725.5.

For all projects over Twenty-five Thousand Dollars (\$25,000), the bidder shall not accept any subbid or enter into any subcontract without proof of the subcontractor's current registration to perform public work under Labor Code section 1725.5.

PRE-BID CONFERENCES OR SITE VISITS:

An optional pre-bid site visit will be held on **May 7, 2019 at 4:00 p.m.** at Manzanita Elementary School in front of office, 1240 Hills Avenue, Redding CA 96001. Whether or not bidders attend an optional pre-bid site visit, which would include the opportunity to inspect the site and may include dissemination of additional information in response to

questions or otherwise, all bidders will be deemed to have notice of all conditions and information which bidders could have obtained or learned by attending the optional pre-bid site visit, including but not limited to any conditions in, at, and about the site, the building or buildings, if any, and any work that may have been done thereon.

BIDS:

Bids to receive consideration shall be made in accordance with the following instructions:

1. Bids shall be made on a form therefor, obtained from the Architect or Owner. Bids not made on the proper form shall be disregarded. Numbers must be stated in words and figures, and the signatures of all individuals must be in longhand.
2. No bid will be considered which makes exceptions, changes, or in any manner makes reservations to the terms of the drawings or specifications. If prequalification is required for this Contract, no bid will be accepted from a contractor that has not been prequalified.
3. Questions regarding documents, discrepancies, omissions, or doubt as to meanings shall be referred immediately to the Architect who will send written instructions clarifying such questions to each bidder. Oral responses will not be binding on the Owner or Architect or any Construction Manager.
4. Each bid must give the full business address of the bidder and be signed by bidder with bidder's usual signature. Bids by partnerships must furnish the full name of all partners and must be signed in the partnership name by a general partner with authority to bind the partnership in such matters, followed by the signature and designation of the person signing. The name of the person signing shall also be typed or printed below the signature. Bids by corporations must be signed with the legal name of the corporation, followed by the name of the state of incorporation and by the signature and designation of the chairman of the board, president or any vice president, and then followed by a second signature by the secretary, assistant secretary, the chief financial officer or assistant treasurer. All persons signing must be authorized to bind the corporation in the matter. The name of each person signing shall also be typed or printed below the signature. Satisfactory evidence of the authority of the officer signing on behalf of a corporation shall be furnished.
5. Pursuant to the provisions of Sections 4100 to 4114, inclusive, of the Public Contract Code of the State of California, which are hereby incorporated and made a part hereof and these Instructions to Bidders, every bidder shall set forth in its bid (using the Owner's form for Designation of Subcontractors:

- A. The name and location of the place of business, the California contractor license number, and for all projects over Twenty-Five Thousand Dollars (\$25,000), the public works contractor registration number, of each

subcontractor who will perform work or labor or render service to the bidder in or about the construction of the work or improvement, or a subcontractor licensed by the State of California who, under subcontract to the bidder, specially fabricates and installs a portion of the Work or improvement according to detailed drawings contained in the plans and specifications, in an amount in excess of one-half ($\frac{1}{2}$) of one percent (1%) of the bidder's total bid. An inadvertent error in listing a California contractor's license number shall not be grounds for filing a bid protest or for considering the bid nonresponsive if the bidder submits the corrected contractor's license number to the Owner within 24 hours after the bid opening, or any continuation thereof, so long as the corrected contractor's license number corresponds to the submitted name and location for that subcontractor.

- B. The portion of the Work which will be done by each such subcontractor. 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 ($\frac{1}{2}$) of one percent (1%) of the bidder's total bid, the bidder agrees to perform that portion itself. The successful bidder shall not, without the consent of the Owner:
- 1) Substitute any person as subcontractor in place of the subcontractor designated in the original bid.
 - 2) Permit any subcontract to be assigned or transferred or allow it to be performed by anyone other than the original subcontractor listed in the bid.
 - 3) Sublet or subcontract any portion of the Work in excess of one-half ($\frac{1}{2}$) of one percent (1%) of the total bid as to which the original bid did not designate a subcontractor.
6. The Director of Industrial Relations of the State of California, in the manner provided by law, has ascertained the general prevailing rate of per diem wages and the rate for legal holidays and overtime work. The Contractor must pay for any labor therein described or classified in an amount not less than the rates specified. Copies of the required rates are on file at the Owner's business office and are available to any interested party on request.
7. All bids must be accompanied by a completed Non-Collusion Declaration and Sufficient Funds Declaration (Labor Code § 2810). All bids must be accompanied by an executed Fingerprinting Notice and Acknowledgment; Iran Contracting Act Certification, if required by law (see form); Workers' Compensation certification; Contractor Questionnaire, if required (see paragraph 13); and DVBE Certification of Participation and Good Faith Worksheet, if DVBE is required (see paragraph 10).

8. Bids must be accompanied by a certified check, cashier's check, or bidder's bond, for an amount not less than ten percent (10%) of the amount of the base bid, made payable to the order of the Owner. If a bidder's bond accompanies the bid, said bond shall be secured by an Admitted Surety (an insurance organization authorized by the Insurance Commissioner to transact business of insurance in the State of California during this calendar year). The surety insurer must, unless otherwise agreed to by Owner in writing, at the time of issuance of the bond, have a rating not lower than "A-" as rated by A.M. Best Company, Inc. or other independent rating companies. Owner reserves the right to approve or reject the surety insurer selected by Contractor and to require Contractor to obtain a bond from a surety insurer satisfactory to the Owner. Said check or bond shall be given as a guarantee that the bidder will enter into the Contract if awarded the Work, and in case of refusal or failure to enter into said Contract, the check or bond, as the case may be, shall be payable to the Owner and retained as liquidated damages.
9. Bids shall be sealed and filed as indicated in the Notice to Bidders. Irrespective of how a bidder chooses to deliver the bid and other documents to the Owner, the bidder is responsible for ensuring that the bid and other documents are actually received at the location designated in the Contract Documents for receipt of the bid and other documents prior to the time for the bid opening. Bids and other documents for any reason not actually received at the designated location prior to the time for the bid opening shall not be opened or considered.
10. **THIS CONTRACT IS SUBJECT TO THE DVBE REQUIREMENTS OF EDUCATION CODE SECTION 17076.11.**
11. Contractor shall maintain its license in good standing through Completion of the Work and all applicable warranty periods. Owner reserves the right to reject any bid as nonresponsive if bidder or any subcontractor is not licensed in good standing from the time the bid is submitted to Owner up to award of the Contract, whether or not the bidder listed the subcontractor inadvertently, or if a listed subcontractor's license is suspended or expires prior to award of the Contract. Owner also reserves the right to reject any bid as nonresponsive if a listed subcontractor's license is not in good standing to perform the work for which it is listed from the time of submission of the bidder's bid to award of the Contract.
12. The Owner reserves the right to waive any irregularity and to reject any or all bids.
13. No Contractor Questionnaire is required to be submitted with a bid on this Contract.
14. To summarize, each bid for the Contract must include the following documents:
 - a. Bid form
 - b. Bid security

- c. Designation of Subcontractors
- d. Non-Collusion Declaration
- e. Sufficient Funds Declaration
- f. Fingerprinting Notice and Acknowledgement
- g. Iran Contracting Act Certification, if required by law
- h. Workers' Compensation Certification
- i. Contractor Questionnaire, if required
- j. DVBE Participation Certification, if required
- k. DVBE Good Faith Worksheet, if required

WITHDRAWAL OF BIDS:

Bids may be withdrawn by bidders prior to the time fixed for the submittal of bids or any authorized postponement thereof. A successful bidder shall not be relieved of the bid unless by consent of the Owner or bidder's recourse to Public Contract Code §5100 et seq.

Unless otherwise required by law, no bidder may withdraw its bid for a period of sixty (60) days after the date set for the opening thereof or any extension thereof. The owner reserves the right to take more than sixty (60) days to make a decision regarding rejection of the bid or award of the Contract.

OPENING OF BIDS:

Opening of bids shall be as soon after the hour set as will be possible; opening and declaration to be as set forth in the Notice to Bidders. Any and all bidders will be permitted to attend.

EXAMINATION OF CONTRACT DOCUMENTS AND SITE:

Before submitting a bid, bidders shall examine the drawings, read the specifications, the form of Agreement between Contractor and Owner, and the other Contract Documents. Bidders shall visit the site of the proposed Work, examine the building, or buildings, if any, and any work that may have been done thereon. Bidders shall fully inform themselves of all conditions, in, at, and about the site, the building or buildings, if any, and any work that may have been done thereon.

Pursuant to Public Contract Code section 1104: 1) bidders shall not be required to assume responsibility for the completeness and accuracy of architectural or engineering plans and specifications, except on clearly designated design build projects; 2) however, bidders shall be required to review architectural or engineering plans and specifications prior to submission of their bids and to report any errors and omissions to the Architect or Owner; and 3) the review shall be confined to the bidder's capacity as a bidder and not as a licensed design professional.

BID PROTESTS:

If any bid protest does not comply with the following procedures, Owner may reject the protest. The protest shall be:

1. in writing;
2. filed and received at Redding School District Office, 5885 East Bonnyview Road, Redding, CA 96001 no more than five (5) days after Owner opens the bids;
3. Owner must receive the protest no later than 4:00 p.m. on the last day to file the protest; and
4. set forth in detail all grounds for the protest, including all facts, supporting documentation, legal authorities and arguments in support of the bid protest.

Owner shall review a bid protest that was not rejected for failing to comply with the above procedures. Any final decision on a bid protest that was not rejected for failing to comply with the above procedures shall be made by the Governing Board.

FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR:

The form of Agreement between Owner and Contractor which the successful bidder will be required to execute, if awarded the Work, is a part of this Bid Package.

ADDENDA OR BULLETINS:

Any addenda or bulletins, issued during the time of bidding, shall form a part of the drawings and specifications loaned to the bidder for the preparation of its bid, shall be covered in the bid, and shall be made a part of the Contract Documents. All addenda or bulletins shall be signed by the Architect and approved by the Division of State Architect.

EVIDENCE OF RESPONSIBILITY:

Upon the request of Owner, a bidder shall submit promptly to the Owner or its designee satisfactory evidence showing the bidder's financial resources, the bidder's experience in the type of work required by the Owner, the bidder's organization available for the performance of the Contract, and any other required evidence of the bidder's or its subcontractor's qualifications to perform the proposed Contract. The Owner may consider such evidence before making its decision awarding the proposed Contract. Failure to submit evidence of the bidder's or its subcontractors' responsibility to perform the proposed Contract may result in rejection of the bid.

AWARD OF CONTRACT:

Rejection of any or all bids, to contract work with whomever and in whatever manner, to abandon work entirely, and/or to waive any informality in receiving of bids is reserved as the right of the Owner. Before the Contract is awarded, the Owner may at its sole discretion, require from the proposed Contractor on the Project further evidence of the reasonable qualifications of such contractor to faithfully, capably, and reasonably perform such proposed Contract and may consider such evidence before making its decision on the award of such proposed Contract.

The Contract shall be awarded to the lowest responsible and responsive bidder as interpreted by the Owner under California law and as specified herein and shall be entered into by the successful bidder within ten (10) days after mailing, faxing or delivery of the Notice of Award of Contract. Owner reserves the right, without any liability, to cancel the award of any bid for any reason at any time before the full execution of the Agreement between Owner and Contractor.

EXECUTION OF AGREEMENT BETWEEN OWNER AND CONTRACTOR:

The Agreement between Owner and Contractor shall be signed by the successful bidder in as many originals as the Owner deems necessary and returned, together with the required Contract bonds, insurance certificates, additional insured endorsement, declarations page, a Public Contract Code section 3006(a) Roof Project Certification, if required, Drug-Free Workplace Certification, and Independent Contractor Student Contact Form, within ten (10) days after receipt of the notice of award of the Contract. If the ten (10) day period would expire after the date for commencement of the Work, Contractor must submit the documents before the date of commencement of the Work. If the successful bidder does not comply with this paragraph, Owner may revoke and/or cancel the award to the successful bidder and award the Contract to the next lowest bidder, or may otherwise proceed as allowed by law. A Roof Project Certification is not required if (1) the Owner has ADA (average daily attendance) of 2,500 or less, or (2) the Work involves repair of 25% or less of the roof, or costs \$21,000 or less.

CONTRACT BONDS:

As required by the Contract Documents, two bonds, as itemized below and in the forms presented in these Contract Documents, shall be furnished by the successful bidder on the Project at the time of entering into the Contract and filed with the Owner before the successful bidder commences any Work. They shall be in the form of surety bonds issued by Admitted Surety insurers (an insurance organization authorized by the Insurance Commissioner to transact business of insurance in the State of California during this calendar year). The surety insurers must, unless otherwise agreed to by Owner in writing, at the time of issuance of the bond, have a rating not lower than "A-" as rated by A.M. Best Company, Inc. or other independent rating companies. Owner reserves the right to approve or reject the surety insurers selected by Contractor and to require Contractor to obtain bonds from surety insurers satisfactory to the Owner.

Performance Bond in the amount of one hundred percent (100%) of the Contract Sum to insure Owner during construction, and for one year after Completion and during any warranty or guaranty period, against faulty or improper materials or workmanship and to assure Owner of full and prompt performance of the Contract.

Payment Bond (Labor and Material) in the amount of one hundred percent (100%) of the Contract Sum in accordance with the laws of the State of California to secure payment of any and all claims for labor and materials used or consumed in performance of this Contract.

SUBSTITUTION OF MATERIALS:

The Contractor must ensure that the proposed substitutions by the Contractor or its subcontractors are submitted to the Owner and Architect a minimum of Seven (7) calendar days prior to the bid opening for review and possible approval of any equipment or materials thought to be equal to or better than those specified in the drawings or specifications. An addendum may be issued prior to bid opening, including all equipment and materials deemed equivalent to those specified and approved by the Architect. Submittals shall include comparative spec-data of the specified equipment or material and the proposed substitution as set forth in the Contract Documents. Submittals without this information will be automatically rejected.

PAYMENTS:

Payments to the Contractor on account of the Contract shall be made in accordance with the terms of the Contract Documents.

TAXES:

The Owner is generally exempt from payment of Federal Excise Tax on materials. The Owner will furnish exemption certificates to the Contractor to be used to obtain materials ordinarily subject to Federal Excise Tax without payment of the tax. Bidder shall deduct Federal Excise Taxes from their bid prices before submitting bids, so that such taxes will not be included in the Contract Sum.

EARLY TERMINATION:

Notwithstanding any provision herein to the contrary, if for any fiscal year of this Contract the governing body of the Owner fails to appropriate or allocate funds for future periodic payments under the Contract after exercising reasonable efforts to do so, the Owner may upon thirty (30) days' notice, order Work on the Project to cease. The Owner will remain obligated to pay for the Work already performed but shall not be obligated to pay the balance remaining unpaid beyond the fiscal period for which funds have been appropriated or allocated and for which the Work has not been done.

TIME OF COMPLETION AND LIQUIDATED DAMAGES:

The Contract Time shall be Seventy-Five (75) calendar days. See Article III of the Agreement.

Liquidated damages for delay in Completion of the Work within the Contract Time will accrue and may be assessed as provided in the Contract Documents, including Article III of the Agreement and Article 8 of the General Conditions.

BID FORM

REDDING SCHOOL DISTRICT BUSINESS OFFICE
5885 EAST BONNYVIEW ROAD
REDDING, CALIFORNIA 96001

Dear Board Members:

The undersigned doing business under the firm name of:

_____ hereby propose and agree to enter into a Contract, to furnish any and all labor, materials, applicable taxes, equipment and services for the Completion of Work described hereinafter and in the Contract Documents:

**MANZANITA ELEMENTARY SCHOOL MODERNIZATION
1240 MANZANITA HILLS AVENUE
REDDING, CA 96001**

prepared by:

Nichols, Melburg & Rossetto
300 Knollcrest Dr., Redding, CA 96002
T. 530.222.3300
king@nmrdesign.com

for the amount of _____ Dollars (\$_____).

UNIT PRICING: If upon commencement of work, existing deteriorated conditions are found in existing roof sheathing, wall sheathing and/or exposed structural elements (fascia and barge rafters) the three unit prices below shall be used as the primary basis for cost determination of removing and replacing those deteriorated materials:

UNIT PRICE NO. 1: (Remove and replace deteriorated roof diagonal sheathing)

ADD _____ DOLLARS

(+\$ _____) per square foot.

UNIT PRICE NO. 2: (Remove and replace deteriorated wall sheathing)

ADD _____ DOLLARS

(+ _____) per square foot.

UNIT PRICE NO. 3: (Remove and replace deteriorated 2x fascia or barge)

ADD _____ DOLLARS

(+ _____) per lineal foot.

If written notice of the Award of Contract is mailed, faxed, or delivered to the undersigned at any time before this bid is withdrawn, the undersigned shall, within ten (10) days after the date of such mailing, faxing, or delivering of such notice, execute and deliver an agreement in the form of agreement present in these Contract Documents and give Performance and Payment Bonds in accordance with the specifications and bid as accepted.

The undersigned hereby designates as the office to which such Notice of Award of Contract may be mailed, faxed, or delivered:

Our Public Liability and Property Damage Insurance is placed with:

Our Workers' Compensation Insurance is placed with:

Circular letters, bulletins, addenda, etc., bound with the specifications or issued during the time of bidding are included in the bid, and, in Completing the Contract, they are to become a part thereof.

The receipt of the following addenda to the specifications is acknowledged:

Addendum No. _____ Date _____ Addendum No. _____ Date _____

Addendum No. _____ Date _____ Addendum No. _____ Date _____

Addendum No. _____ Date _____ Addendum No. _____ Date _____

Addendum No. _____ Date _____ Addendum No. _____ Date _____

Addendum No. _____ Date _____ Addendum No. _____ Date _____

This bid may be withdrawn at any time prior to the scheduled time for the opening of bids or any authorized postponement thereof.

A bidder shall not submit a bid unless the bidder's California contractor's license number appears clearly on the bid, the license expiration date and class are stated, and the bid contains a statement that the representations made therein are made under penalty of perjury. Any bid submitted by a contractor who is not licensed pursuant to Business and Professions Code section 7028.15 shall be considered nonresponsive and shall be rejected. Any bid not containing the above information may be considered nonresponsive and may be rejected.

NOTE: Each bid must give the full business address of the bidder and be signed by bidder with bidder's usual signature. Bids by partnerships must furnish the full name of all partners and must be signed in the partnership name by a general partner with authority to bind the partnership in such matters, followed by the signature and designation of the person signing. The name of the person signing shall also be typed or printed below the signature. Bids by corporations must be signed with the legal name of the corporation, followed by the name of the state of incorporation and by the signature and designation of the chairman of the board, president or any vice president, and then followed by a second signature by the secretary, assistant secretary, the chief financial officer or assistant treasurer. All persons signing must be authorized to bind the corporation in the matter. The name of each person signing shall also be typed or printed below the signature. Satisfactory evidence of the authority of the officer signing on behalf of a corporation shall be furnished.

The undersigned declares under penalty of perjury under the laws of the State of California that the representations made in this bid are true and correct.

Print or Type Name: _____

Title: _____

Name of Company as Licensed: _____

Business Address: _____

Telephone Number: _____

California Contractor License No.: _____

Class and Expiration Date: _____

Public Works Contractor Registration No. (if applicable): _____

State of Incorporation, if Applicable: _____

() Evidence of authority to bind corporation is attached.

**SECTION 00 41 00
BID FORM**

Dated: _____, _____

Signed: _____

BID BOND

KNOW ALL MEN BY THESE PRESENTS that we the undersigned _____ as Principal and _____ as Surety, are hereby held and firmly bound unto the Redding School District "Owner" in the sum of _____ Dollars (\$_____) for payment of which sum, well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns.

The condition of the above obligation is such that whereas the Principal has submitted to the Owner a certain bid, attached hereto and hereby made a part hereof, to enter into a Contract in writing for the construction of **Manzanita Elementary School Modernization** in strict accordance with Contract Documents.

NOW, THEREFORE,

- a. If said bid shall be rejected, or, in the alternative;
- b. If said bid shall be accepted and the Principal shall execute and deliver a contract in the form of agreement attached hereto and shall execute and deliver Performance and Payment Bonds in the forms attached hereto (all properly completed in accordance with said bid), and shall in all other respects perform the agreement created by the acceptance of said bid;

Then this obligation shall be void, otherwise the same shall remain in full force and effect, it being expressly understood and agreed that the liability of the Surety for any and all default of the Principal hereunder shall be the amount of this obligation as herein stated.

Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract on the call for bids, or to the Work to be performed hereunder, 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 said Contract or the call for bids, or to the Work, or to the specifications.

IN WITNESS WHEREOF, the above-bounden parties have executed this instrument under several seals this ____ day of _____, _____, the name and corporate party being hereto affixed and these presents duly signed by its

**SECTION 000 41 10
BID BOND**

undersigned representative, pursuant to authority of its governing body. In the presence of:

(Notary Seal)

(Principal)

(Business Address)

(Corporate Surety)

Business Address)

By: _____

The rate or premium of this bond is _____ per thousand, the total amount of premium charged, \$ _____.

(The above must be filled in by Corporate Surety).

DESIGNATION OF SUBCONTRACTORS

Each bidder shall set forth below the name and the location of the place of business of each subcontractor and the California contractor license number, and public works contractor registration number (for all projects over Twenty-five Thousand Dollars (\$25,000)), of each subcontractor who will perform work or labor or render service to the Contractor in or about the construction of the Work or improvement, or to a subcontractor licensed by the State of California who, under subcontract to the Contractor, specially fabricates and installs a portion of the Work or improvement according to detailed drawings contained in the plans and specifications, in an amount in excess of one-half of 1 percent (0.5%) of the bidder's total bid, and the portion of the Work which will be done by each subcontractor. An inadvertent error in listing a California contractor's license number shall not be grounds for filing a bid protest or for considering the bid nonresponsive if the bidder submits the corrected contractor's license number to the Owner within 24 hours after the bid opening, or any continuation thereof, so long as the corrected contractor's license number corresponds to the submitted name and location for that subcontractor. If the Contractor fails to specify a subcontractor for any portion of the Work to be performed under the Contract in excess of one-half of 1 percent (0.5%) of the Contractor's total bid, the Contractor 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.

Subletting or subcontracting of any portion of the Work as to which no subcontractor was designated in the original bid shall only be permitted in cases of public emergency or necessity, and then only after a finding reduced to writing as a public record of the legislative body of the Owner.

For all projects over Twenty-five Thousand Dollars (\$25,000): for any bid proposal submitted and for any contract for public work entered into, an inadvertent error in listing a subcontractor who is not registered under Labor Code section 1725.5 shall not be grounds for filing a bid protest or grounds for considering the bid nonresponsive, provided that either: the subcontractor is registered prior to the bid opening; or the subcontractor is registered and has paid the penalty registration fee specified in Labor Code section 1725.5(a)(2)(E), if applicable, within 24 hours after the bid opening; or the subcontractor is replaced by another registered subcontractor under Public Contract Code section 4107. Failure of a listed subcontractor to be registered shall be grounds under Public Contract Code section 4107 for the Contractor, with the Owner's consent, to substitute a registered subcontractor for the unregistered subcontractor.

Failure to provide this information in a legible manner may result in the rejection of an otherwise acceptable bid.

NOTE: *Reproduce page two of this section for additional listings needed beyond the length of this form.*

SECTION 00 42 00
DESIGNATION FO SUBCONTRACTORS

Portion of Work	Name of Subcontractor	Location of Subcontractor	California Contractor License Number	Public Works Contractor DIR Registration Number

**SECTION 00 42 00
DESIGNATION FO SUBCONTRACTORS**

I am the authorized representative of the Bidder submitting this Designation of Subcontractors and I declare that each subcontractor listed holds a valid and current contractor license in good standing in California to perform the portion of work for which the subcontractor is listed.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on _____, 20____, at Redding, California.

Signature: _____

Print Name: _____

Title: _____

SECTION 00 43 00
DRUG FREE WORKPLACE CERTIFICATION

DRUG-FREE WORKPLACE CERTIFICATION

This Drug-Free Workplace Certification is required pursuant to Government Code Sections 8350 *et seq.*, the Drug-Free Workplace Act of 1990. The Drug-Free Workplace Act of 1990 requires that every person or organization awarded a contract or grant for the procurement of any property or services 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 awarded by a State agency may be subject to suspension of payments or termination of the contract, or both, and the contractor may be subject to debarment from future contracting if the state agency determines that specified acts have occurred.

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

- (a) Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensation, possession or use of a controlled substance is prohibited in the person's or organization's workplace and specifying actions which will be taken against employees for violations of the prohibition;
- (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;
 - (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 Government Code Section 8355 listed above and will publish a statement notifying employees concerning (a) the prohibition of controlled substance at the workplace, (b) establishing a drug-free awareness program, and (c) requiring that each employee engaged in the performance of the contract or grant be given a copy of the statement required by Section 8355(a) and requiring that the employee agree to abide by the terms of that statement.

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

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

_____ Name of Contractor Signature	Date: _____
_____ Print Name	_____

FINGERPRINTING NOTICE AND ACKNOWLEDGMENT
(Education Code Section 45125.2(a))

Note: This document must be executed and submitted with the bid.

Business entities entering into contracts with the Owner for the construction, reconstruction, rehabilitation or repair of a facility must comply with Education Code sections 45125.1 and 45125.2. Such entities are responsible for ensuring full compliance with the law and should therefore review all applicable statutes and regulations. The following information is provided simply to assist such entities with compliance with the law.

1. If the Owner determines your employee(s) or you as a sole proprietorship will have more than limited contact with students, then you must take one or more of the following steps:
 - a. Install a physical barrier at the worksite to limit contact with pupils.
 - b. Have an employee (if not a sole proprietorship), who the Department of Justice has ascertained has not been convicted of a violent or serious felony, continually monitor and supervise employees. The entity shall verify in the Independent Contractor Student Contact Form to the Owner that the employee charged with monitoring and supervising its employees has no such convictions. (See attached.)
 - c. Arrange, with Owner’s approval, for surveillance by Owner’s personnel.

If one or more of these steps is taken, you are not required to comply with Education Code section 45125.1.

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

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

Dated: _____ Signature _____

Name: _____ Title: _____

ATTACHMENT

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

- (1) Murder or voluntary manslaughter.
- (2) Mayhem.
- (3) Rape as defined in paragraph (2) or (6) of subdivision (a) of Section 261 or paragraph (1) or (4) of subdivision (a) of Section 262.
- (4) Sodomy as defined in subdivision (c) or (d) of Section 286.
- (5) Oral copulation as defined in subdivision (c) or (d) of Section 288a.
- (6) Lewd or lascivious act as defined in subdivision (a) or (b) of Section 288.
- (7) Any felony punishable by death or imprisonment in the state prison for life.
- (8) Any felony in which the defendant inflicts great bodily injury on any person other than an accomplice which has been charged and proved as provided for in Section 12022.7, 12022.8, or 12022.9 on or after July 1, 1977, or as specified prior to July 1, 1977, in Sections 213, 264, and 461, or any felony in which the defendant uses a firearm which use has been charged and proved as provided in subdivision (a) of Section 12022.3, or Section 12022.5 or 12022.55.
- (9) Any robbery.
- (10) Arson, in violation of subdivision (a) or (b) of Section 451.
- (11) Sexual penetration as defined in subdivision (a) or (j) of Section 289.
- (12) Attempted murder.
- (13) A violation of Section 18745, 18750, or 18755.
- (14) Kidnapping.
- (15) Assault with the intent to commit a specified felony, in violation of Section 220.
- (16) Continuous sexual abuse of a child, in violation of Section 288.5.
- (17) Carjacking, as defined in subdivision (a) of Section 215.

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FINGERPRINTING NOTICE**

- (18) Rape, spousal rape, or sexual penetration, in concert, in violation of Section 264.1.
- (19) Extortion, as defined in Section 518, which would constitute a felony violation of Section 186.22 of the Penal Code.
- (20) Threats to victims or witnesses, as defined in Section 136.1, which would constitute a felony violation of Section 186.22 of the Penal Code.
- (21) Any burglary of the first degree, as defined in subdivision (a) of Section 460, wherein it is charged and proved that another person, other than an accomplice, was present in the residence during the commission of the burglary.
- (22) Any violation of Section 12022.53.
- (23) A violation of subdivision (b) or (c) of Section 11418.

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

- (1) Murder or voluntary manslaughter; (2) Mayhem; (3) Rape; (4) Sodomy by force, violence, duress, menace, threat of great bodily injury, or fear of immediate and unlawful bodily injury on the victim or another person; (5) Oral copulation by force, violence, duress, menace, threat of great bodily injury, or fear of immediate and unlawful bodily injury on the victim or another person; (6) Lewd or lascivious act on a child under the age of 14 years; (7) Any felony punishable by death or imprisonment in the state prison for life; (8) Any felony in which the defendant personally inflicts great bodily injury on any person, other than an accomplice, or any felony in which the defendant personally uses a firearm; (9) Attempted murder; (10) Assault with intent to commit rape, or robbery; (11) Assault with a deadly weapon or instrument on a peace officer; (12) Assault by a life prisoner on a non-inmate; (13) Assault with a deadly weapon by an inmate; (14) Arson; (15) Exploding a destructive device or any explosive with intent to injure; (16) Exploding a destructive device or any explosive causing bodily injury, great bodily injury, or mayhem; (17) Exploding a destructive device or any explosive with intent to murder; (18) Any burglary of the first degree; (19) Robbery or bank robbery; (20) Kidnapping; (21) Holding of a hostage by a person confined in a state prison; (22) Attempt to commit a felony punishable by death or imprisonment in the state prison for life; (23) Any felony in which the defendant personally used a dangerous or deadly weapon; (24) Selling, furnishing, administering, giving, or offering to sell, furnish, administer, or give to a minor any heroin, cocaine, phencyclidine (PCP), or any methamphetamine-related drug, as described in paragraph (2) of subdivision (d) of Section 11055 of the Health and Safety Code, or any of

the precursors of methamphetamines, as described in subparagraph (A) of paragraph (1) of subdivision (f) of Section 11055 or subdivision (a) of Section 11100 of the Health and Safety Code; (25) Any violation of subdivision (a) of Section 289 where the act is accomplished against the victim's will by force, violence, duress, menace, or fear of immediate and unlawful bodily injury on the victim or another person; (26) Grand theft involving a firearm; (27) carjacking; (28) any felony offense, which would also constitute a felony violation of Section 186.22; (29) assault with the intent to commit mayhem, rape, sodomy, or oral copulation, in violation of Section 220; (30) throwing acid or flammable substances, in violation of Section 244; (31) assault with a deadly weapon, firearm, machine gun, assault weapon, or semiautomatic firearm or assault on a peace officer or firefighter, in violation of Section 245; (32) assault with a deadly weapon against a public transit employee, custodial officer, or school employee, in violation of Sections 245.2, 245.3, or 245.5; (33) discharge of a firearm at an inhabited dwelling, vehicle, or aircraft, in violation of Section 246; (34) commission of rape or sexual penetration in concert with another person, in violation of Section 264.1; (35) continuous sexual abuse of a child, in violation of Section 288.5; (36) shooting from a vehicle, in violation of subdivision (c) or (d) of Section 26100; (37) intimidation of victims or witnesses, in violation of Section 136.1; (38) criminal threats, in violation of Section 422; (39) any attempt to commit a crime listed in this subdivision other than an assault; (40) any violation of Section 12022.53; (41) a violation of subdivision (b) or (c) of Section 11418; and (42) any conspiracy to commit an offense described in this subdivision.

INDEPENDENT CONTRACTOR STUDENT CONTACT FORM

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

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

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

- A physical barrier will be installed at the worksite to limit contact with pupils.
- Employees (if not a sole proprietorship) will be continually monitored and supervised by an employee who has not been convicted of a violent or serious felony.

Name of Supervising Employee: _____

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

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

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

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

Dated: _____
Signature _____
Typed Name: _____
Title: _____

**SECTION 00 44 00
FINGERPRINTING NOTICE**

Note: This document must be executed and submitted with the executed Agreement between Owner and Contractor.

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

ESCROW AGREEMENT FOR SECURITY DEPOSITS IN LIEU OF RETENTION

This Escrow Agreement is made and entered into by and between the Redding School District, whose address is 5885 E. Bonnyview Road, Redding CA, 96001 (hereinafter called "Owner"), _____ whose address is _____ (hereinafter called "Contractor"); and _____, a state or federally chartered bank in California whose address is _____ (hereinafter called "Escrow Agent").

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

1. Pursuant to section 22300 of the Public Contract Code of the State of California, Contractor has the option to deposit securities with Escrow Agent as a substitute for retention earnings required to be withheld by the Owner pursuant to the Contract entered into between the Owner and Contractor in the amount of _____ Dollars (\$ _____), and dated _____, _____, (the "Contract"). Alternatively, on written request of the Contractor, the Owner shall make payments of the retention earnings directly to the Escrow Agent. When Contractor deposits the securities as a substitute for retention earnings, the Escrow Agent shall notify the Owner within ten (10) calendar days of the deposit. The market value of the securities at the time of the substitution, as valued by the Owner, shall be at least equal to the cash amount then required to be withheld as retention under the terms of the Contract between the Owner and Contractor. If the Owner determines that the securities are not adequate it will notify Contractor and Escrow Agent, and Contractor shall deposit additional security as further determined by the Owner. Securities shall be held in the name of the Owner and shall designate the Contractor as the beneficial owner.
2. Thereafter, Owner shall make progress payments to the Contractor for such funds which otherwise would be withheld from progress payments pursuant to the Contract provisions, provided that the Escrow Agent holds securities in the form and amount specified above.
3. Pursuant to Public Contract Code section 22300, as an alternative to the procedures set forth above, Contractor may request in writing that the Owner pay

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ESCROW AGENT FOR SECURITY DEPOSITS

retention amounts directly to Escrow Agent. When the Owner makes payment of retentions earned directly to the Escrow Agent, the Escrow Agent shall hold them for benefit of the Contractor until such time as the escrow created under this Escrow Agreement is terminated. The Contractor may direct the investment of the payments into securities. All terms and conditions of this Escrow Agreement and the rights and responsibilities of the parties shall be equally applicable and binding when the Owner pays the Escrow Agent directly.

4. The Contractor shall be responsible for paying all fees for the expenses incurred by Escrow Agent in administering the Escrow Account and all expenses of the Owner. These expenses and payment terms shall be determined by the Owner, Contractor and Escrow Agent.
5. The interest earned on the securities or the money market accounts held in escrow and all interest earned on that interest shall be for the sole account of Contractor and shall be subject to withdrawal by Contractor at any time and from time to time without notice to the Owner.
6. Contractor shall have the right to withdraw all or any part of the principal in the Escrow Account only by written notice to Escrow Agent accompanied by written authorization from Owner to the Escrow Agent that Owner consents to the withdrawal of the amount sought to be withdrawn by Contractor.
7. The Owner shall have the right to draw upon the securities or any amount paid directly to Escrow Agent in the event of default by the Contractor. Upon seven (7) days written notice to the Escrow Agent from the Owner of the default, the Escrow Agent shall immediately convert the securities to cash and shall distribute the cash, including any amounts paid directly to Escrow Agent pursuant to Section 3 above, as instructed by Owner. Escrow Agent shall not be concerned with the validity of any notice of default given by Owner pursuant to this paragraph, and shall promptly comply with Owner's instructions to pay over said escrowed assets. Escrow Agent further agrees to not interplead the escrowed assets in response to a conflicting demand and hereby waives any present or future opportunity of interpleader.
8. Upon receipt of written notification from the Owner certifying that the Contract is final and complete, and that the Contractor has complied with all requirements and procedures applicable to the Contract, Escrow Agent shall release to Contractor all securities and interest on deposit less escrow fees and charges of the Escrow Account. The escrow shall be closed immediately upon disbursement of all moneys and securities on deposit and payment of fees and charges.
9. Escrow Agent shall rely on the written notifications from the Owner and Contractor pursuant to Sections (4), (5), (6), (7) and (8) of this Agreement and the Owner and Contractor shall hold Escrow Agent harmless from Escrow Agent's release and disbursement of the securities and interest as set forth above.

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

ON BEHALF OF OWNER:

Signature

Typewritten Name

Title

ON BEHALF OF CONTRACTOR:

Signature

Typewritten Name

Title

ON BEHALF OF ESCROW AGENT:

Signature

Typewritten Name

Title

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

OWNER:

Signature

Typewritten Name

Title

**SECTION 00 45 00
ESCROW AGENT FOR SECURITY DEPOSITS**

CONTRACTOR:

Signature

Typewritten Name

Title

ESCROW AGENT:

Signature

Typewritten Name

Title

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

**PRIME BIDDER CERTIFICATION OF DISABLED VETERAN
BUSINESS ENTERPRISE PARTICIPATION – SECTION 00 46 00**

To be completed by the Prime Bidder

PART I – IDENTIFICATION INFORMATION		
BIDDER'S NAME	BUSINESS ADDRESS	TELEPHONE NUMBER
SCHOOL DISTRICT	COUNTY	APPLICATION NO.
REDDING SCHOOL DISTRICT	SHASTA	
<p>PART II – METHOD OF COMPLIANCE WITH DVBE PARTICIPATION GOALS – Include this form and any other applicable documents listed in this table with your bid/proposal. Read the three columns in the table below as sentences from left to right. Check the appropriate box to indicate your method of committing the contract dollar amount.</p> <p>NOTE: <i>Architectural, engineering, environmental, land surveying or construction management firms must indicate their method of compliance by marking the appropriate box A, B, C, or D after selection by the District and before the contract is signed.</i></p>		
YOUR BUSINESS ENTERPRISE	AND YOU	AND YOU
A. <input type="checkbox"/> <i>is Disabled Veteran owned and your forces, will perform at least 3 percent of this contract</i>	<i>will include a copy of your DVBE letter from the Office of Small Business and Disabled Veteran Business Enterprise Services (OSDS).</i>	
B. <input type="checkbox"/> <i>is Disabled Veteran owned but is unable to perform the 3 percent of this contract with your forces</i>	<i>will use DVBE subcontractors/ suppliers to bring the contract participation to at least 3 percent</i>	<i>will include a copy of each DVBE's letter from OSDS (including yours, if applicable).</i>
C. <input type="checkbox"/> <i>is not Disabled Veteran owned</i>	<i>will use DVBE subcontractors/ suppliers for at least 3 percent of this contract</i>	
D. <input type="checkbox"/> <i>is unable to meet the required participation goals</i>	<i>will complete a Good Faith Effort to obtain DVBE participation</i>	<i>will include the Prime Bidder's Good Faith Effort Worksheet.</i>

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

Continued on reverse side

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

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

- A. If your business enterprise is a DVBE, list in the appropriate column the total dollar amount of your bid to be performed by your own participation.
- B. List all your DVBE subcontractors/suppliers. Enter in the appropriate column the dollar amount for each of your subcontractors/suppliers.
- C. Enter the total of Lines A and B for each column.
- D. Enter the dollar amount of the bid/proposal to be performed by **non-DVBE** firms. Note: This line is the sum of the prime and subcontractor(s) **non-DVBE** dollar participation.
- E. Enter the sum of the column totals from Line C and Line D. Note: Please be aware that the final determination of DVBE compliance is made based on the contract amount resulting from the district’s acceptance or rejection of alternates.

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

PRIME BIDDER GOOD FAITH EFFORT WORKSHEET - SECTION 00 47 00

This worksheet is to be used to assist the Prime Bidder in meeting the 3% DVBE participation goal

BIDDER'S NAME	BUSINESS ADDRESS	CONTACT PERSON
TELEPHONE NUMBER	OWNER REDDING SCHOOL DISTRICT	COUNTY SHASTA

GENERAL INSTRUCTIONS:

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

PART I – CONTACTS

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

CATEGORY	TELEPHONE NUMBER	DATE CONTACTED	PERSON CONTACTED
1. Owner			
2. Office of Small Business and Disabled Veteran Business Enterprise Services (OSDS). OSDS provides assistance locating DVBEs at https://caleprocure.ca.gov/pages/PublicSearch/supplier-search.aspx .	(916) 375-4940		
3. DVBE Organizations (<i>List</i>):			
4. Write "recorded message" in this column, if applicable.			

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

Attach copies of advertisements to this form.

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

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

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

DISABLED VETERANS BUSINESS ENTERPRISES CONTACTED	SELECTED		REASON NOT SELECTED <i>This section must be completed</i>	NO RESPONSE
	YES	NO		

IMPORTANT NOTE:

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

CERTIFICATION

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

SIGNATURE OF CHIEF EXECUTIVE OFFICER	DATE
--------------------------------------	------

ROOF PROJECT CERTIFICATION

(Public Contract Code §3006(a) and (b))

I, _____ [name], _____ [name of employer], certify that I have not offered, given, or agreed to give, received, accepted, or agreed to accept, any gift, contribution, or any financial incentive whatsoever to or from any person in connection with the roof project contract. As used in this certification, "person" means any natural person, business, partnership, corporation, union, committee, club, or other organization, entity, or group of individuals. Furthermore, I, _____ [name], _____ [name of employer], certify that I do not have, and throughout the duration of the contract, I will not have, any financial relationship in connection with the performance of this contract with any architect, engineer, roofing, consultant, materials manufacturer, distributor, or vendor that is not disclosed below.

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

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

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

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

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

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

_____ Signature _____ Date

_____ Print Name

_____ Print Name of Employer

Sufficient Funds Declaration
(Labor Code section 2810)
To Be Executed by Bidder and Submitted with Bid

Owner: Redding School District
Contract for: _____ Project

I, _____, declare that I am the _____ of _____, the entity making and submitting the bid for the above Project that accompanies this Declaration, and that such bid includes sufficient funds to permit _____ [insert name of entity] to comply with all local, state or federal labor laws or regulations during the performance of the Contract for the Project, including payment of prevailing wage, and that _____ [the entity] will comply with the provisions of Labor Code section 2810(d) if awarded the Contract.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and executed on _____ 20__, at _____ [city], _____ [state].

Date: _____

Signature
Print Name: _____
Print Title: _____

AGREEMENT BETWEEN OWNER AND CONTRACTOR

This Agreement, effective _____, 2019, is by and between Redding School District, Shasta County, California, hereinafter called the "Owner" and _____ hereinafter called the "Contractor."

WITNESSETH: That the Contractor and the Owner for the consideration hereinafter named agree as follows:

ARTICLE I. SCOPE OF WORK. The Contractor agrees to furnish all labor, equipment and materials, including tools, implements, and appliances required, and to perform all the Work in a good and workmanlike manner, free from any and all liens and claims from mechanics, material suppliers, subcontractors, artisans, machinists, teamsters, freight carriers, and laborers required for:

**MANZANITA ELEMENTARY SCHOOL MODERNIZATION
1240 MANZANITA HILLS AVENUE, REDDING CA 96001**

all in strict compliance with the plans, drawings and specifications therefore prepared by:

**Nichols, Melburg & Rossetto
300 Knollcrest Dr., Redding, CA 96002
T. 530.222.3300
king@nmrdesign.com**

and other Contract Documents relating thereto.

ARTICLE II. CONTRACT DOCUMENTS. The Contractor and the Owner agree that all of the documents listed in Article 1.1.1 of the General Conditions form the Contract Documents which form the Contract.

ARTICLE III. TIME TO COMPLETE AND LIQUIDATED DAMAGES.

Time is of the essence in this Contract, and the time of Completion for the Work ("the Contract Time") shall be **Seventy Five (75) calendar days** from (a) the date of commencement of the Work as established in the Owner's Notice to Proceed, or (b) if no other date is established in a Notice to Proceed from Owner, the date of Contractor's actual commencement of the Work (including mobilization).

Failure to Complete the Work within the time and in the manner provided for by the Contract Documents shall subject the Contractor to liquidated damages. The actual occurrence of damages and the actual amount of the damages which the Owner would

suffer if the Work were not Completed within the Contract Time are dependent upon many circumstances and conditions which could prevail in various combinations and, from the nature of the case, it is impracticable and extremely difficult to fix the actual damages. Damages which the Owner would suffer in the event of such delay include, but are not limited to, loss of the use of the Work, disruption of activities, costs of administration and supervision, and the incalculable inconvenience and loss suffered by the public.

Accordingly, the parties agree that the amount herein set forth shall be the amount of damages which the Owner shall directly incur upon failure of the Contractor to Complete the Work within the Contract Time: **\$1,500** for each calendar day by which Completion of the Work is delayed beyond the Contract Time as adjusted by Change Orders.

If Contractor causes delay to any other contractor's work on the Project that results in delayed *completion* of the Project, Contractor shall be subject to liquidated damages in the amount set forth above for each calendar day Contractor delayed *completion* of the Project. The actual occurrence of damages and the actual amount of the damages which the Owner would suffer for such delayed *completion* of the Project are dependent upon many circumstances and conditions which could prevail in various combinations and, from the nature of the case, it is impracticable and extremely difficult to fix the actual damages. Damages which the Owner would suffer in the event of such delay include, but are not limited to, loss of the use of the other contractor's work and the Project, disruption of activities, costs of administration and supervision, and the incalculable inconvenience and loss suffered by the public.

Accordingly, the parties agree that the amount set forth herein shall be presumed to be the amount of damages which the Owner shall directly incur for each calendar day that *completion* of the Project is delayed because of Contractor caused delays to the work of other contractors.

For Contractor's obligations regarding claims against Owner from other contractors on the Project alleging that Contractor caused delays to their work, see General Conditions sections 3.7.4, 3.16 and 6.2.3.

If liquidated damages accrue as described above, the Owner, in addition to all other remedies provided by law, shall have the right to assess the liquidated damages at any time, and to withhold liquidated damages (and any interest thereon) at any time from any and all retention or progress payments, which would otherwise be or become due the Contractor. In addition, if it is reasonably apparent to the Owner before liquidated damages begin to accrue that Contractor cannot or will not Complete the Work within the Contract Time, Owner may assess and withhold, from retention or progress payments, the estimated amount of liquidated damages that will accrue in the future. If the retained percentage or withheld progress payments are not sufficient to discharge all liabilities of the Contractor incurred under this Article, the Contractor and its sureties shall continue to remain liable to the Owner until all such liabilities are satisfied in full.

If Owner accepts any work or makes any payment under this Agreement after a default by reason of delays, the payment or payments shall in no respect constitute a waiver or modification of any Agreement provisions regarding time of Completion and liquidated damages.

ARTICLE IV. PAYMENT AND RETENTION. The Owner agrees to pay the Contractor in current funds _____ Dollars (\$ _____) for work satisfactorily performed after receipt of properly documented and submitted Applications for Payment and to make payments on account thereof, as provided in the General Conditions.

ARTICLE V. CHANGES. Changes in this Agreement or in the Work to be done under this Agreement shall be made as provided in the General Conditions.

ARTICLE VI. TERMINATION. The Owner or Contractor may terminate the Contract as provided in the General Conditions.

ARTICLE VII. PREVAILING WAGES. The Project is a public work, the Work shall be performed as a public work and pursuant to the provisions of Section 1770 et seq. of the Labor Code of the State of California, which are hereby incorporated by reference and made a part hereof, the Director of Industrial Relations has determined the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work in the locality in which the Work is to be performed, for each craft, classification or type of worker needed to execute this Contract. Per diem wages shall be deemed to include employer payments for health and welfare, pension, vacation, apprenticeship or other training programs, and similar purposes. Copies of the rates are on file at the Owner's principal office. The rate of prevailing wage for any craft, classification or type of workmanship to be employed on this Project is the rate established by the applicable collective bargaining agreement which rate so provided is hereby adopted by reference and shall be effective for the life of this Agreement or until the Director of the Department of Industrial Relations determines that another rate be adopted. It shall be mandatory upon the Contractor and on any subcontractor to pay not less than the said specified rates to all workers employed in the execution of this Agreement.

The Contractor and any subcontractor under the Contractor as a penalty to the Owner shall forfeit not more than Two Hundred Dollars (\$200.00) for each calendar day or portion thereof for each worker paid less than the stipulated prevailing rates for such work or craft in which such worker is employed. The difference between such stipulated prevailing wage rates and the amount paid to each worker for each calendar day or portion thereof for which each worker was paid less than the stipulated prevailing wage rate shall be paid to each worker by the Contractor.

The Contractor and each Subcontractor shall keep or cause to be kept an accurate record for Work on this Contract and Project showing the names, addresses, social

security numbers, work classification, straight time and overtime hours worked and occupations of all laborers, workers and mechanics employed by them in connection with the performance of this Contract or any subcontract thereunder, and showing also the actual per diem wage paid to each of such workers, which records shall be open at all reasonable hours to inspection by the Owner, its officers and agents and to the representatives of the Division of Labor Standards Enforcement of the State Department of Industrial Relations. The Contractor and each subcontractor shall furnish a certified copy of all payroll records directly to the Labor Commissioner.

Public works projects shall be subject to compliance monitoring and enforcement by the Department of Industrial Relations. For all projects over Twenty-five Thousand Dollars (\$25,000), a contractor or subcontractor shall not be qualified to submit a bid or to be listed in a bid proposal subject to the requirements of Public Contract Code section 4104 unless currently registered and qualified under Labor Code section 1725.5 to perform public work as defined by Division 2, Part 7, Chapter 1 (§§ 1720 et seq.) of the Labor Code. For all projects over Twenty-five Thousand Dollars (\$25,000), a contractor or subcontractor shall not be qualified to enter into, or engage in the performance of, any contract of public work (as defined by Division 2, Part 7, Chapter 1 (§§ 1720 et seq.) of the Labor Code) unless currently registered and qualified under Labor Code section 1725.5 to perform public work.

ARTICLE VIII. WORKING HOURS. In accordance with the provisions of Sections 1810 to 1815, inclusive, of the Labor Code of the State of California, which are hereby incorporated and made a part hereof, the time of service of any worker employed by the Contractor or a Subcontractor doing or contracting to do any part of the Work contemplated by this Agreement is limited and restricted to eight hours during any one calendar day and forty hours during any one calendar week, provided, that work may be performed by such employee in excess of said eight hours per day or forty hours per week provided that compensation for all hours worked in excess of eight hours per day, and forty hours per week, is paid at a rate not less than one and one-half (1½) times the basic rate of pay. The Contractor and every Subcontractor shall keep an accurate record showing the name of and the actual hours worked each calendar day and each calendar week by each worker employed by them in connection with the Work. The records shall be kept open at all reasonable hours to inspection by representatives of the Owner and the Division of Labor Standards Enforcement. The Contractor shall as a penalty to the Owner forfeit Twenty-five Dollars (\$25.00) for each worker employed in the execution of this Agreement by the Contractor or by any subcontractor for each calendar day during which such worker is required or permitted to work more than eight hours in any one calendar day, and forty hours in any one calendar week, except as herein provided.

ARTICLE IX. APPRENTICES. The Contractor agrees to comply with Chapter 1, Part 7, Division 2, Sections 1777.5 and 1777.6 of the California Labor Code, which are hereby incorporated and made a part hereof. These sections require that contractors and subcontractors employ apprentices in apprenticeable occupations in a ratio of not less than one hour of apprentice's work for each five hours of work performed by a journeyman (unless an exemption is granted in accordance with Section 1777.5) and

that contractors and subcontractors shall not discriminate among otherwise qualified employees as indentured apprentices on any public works solely on the ground of sex, race, religious creed, national origin, ancestry or color. Only apprentices as defined in Labor Code Section 3077, who are in training under apprenticeship standards and who have signed written apprentice agreements, will be employed on public works in apprenticeable occupations. The responsibility for compliance with these provisions is fixed with the Contractor for all apprenticeable occupations.

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

Contractor shall be responsible for any additional DSA fees related to review of proposed changes to the DSA-approved construction documents, to the extent the proposed changes were caused by Contractor’s wrongful act or omissions. If inspected Work is found to be in non-compliance with the DSA-approved construction documents or the DSA-approved testing and inspection program, then it must be removed and corrected. Any construction that covers unapproved or uninspected Work is subject to removal and correction, at Contractor’s expense, in order to permit inspection and approval of the covered work in accordance with the DSA Oversight Process.

ARTICLE XI. INDEMNIFICATION AND INSURANCE. The Contractor will defend, indemnify and hold harmless the Owner, its governing board, officers, agents, trustees, employees and others as provided in the General Conditions.

By this statement the Contractor represents that it has secured the payment of Workers' Compensation in compliance with the provisions of the Labor Code of the State of California and during the performance of the work contemplated herein will continue so to comply with said provisions of said Code. The Contractor shall supply the Owner with certificates of insurance evidencing that Workers' Compensation Insurance is in effect and providing that the Owner will receive thirty (30) days' notice of cancellation.

Contractor shall provide the insurance set forth in the General Conditions. The amount of general liability insurance shall be \$1,000,000 per occurrence for bodily injury, personal injury and property damage and the amount of automobile liability insurance shall be \$1,000,000 per accident for bodily injury and property damage combined single limit.

ARTICLE XII. ENTIRE AGREEMENT. The Contract constitutes the entire agreement between the parties relating to the Work, and supersedes any prior or

contemporaneous agreement between the parties, oral or written, including the Owner's award of the Contract to Contractor, unless such agreement is expressly incorporated herein. The Owner makes no representations or warranties, express or implied, not specified in the Contract. The Contract is intended as the complete and exclusive statement of the parties' agreement pursuant to Code of Civil Procedure section 1856.

ARTICLE XIII. EXECUTION OF OTHER DOCUMENTS. The parties to this Agreement shall cooperate fully in the execution of any and all other documents and in the completion of any additional actions that may be necessary or appropriate to give full force and effect to the terms and intent of the Contract.

ARTICLE XIV. EXECUTION IN COUNTERPARTS. This Agreement may be executed in counterparts such that the signatures may appear on separate signature pages. A copy, or an original, with all signatures appended together, shall be deemed a fully executed Agreement.

ARTICLE XV. BINDING EFFECT. Contractor, by execution of this Agreement, acknowledges that Contractor has read this Agreement and the other Contract Documents, understands them, and agrees to be bound by their terms and conditions. The Contract shall inure to the benefit of and shall be binding upon the Contractor and the Owner and their respective successors and assigns.

ARTICLE XVI. SEVERABILITY; GOVERNING LAW; CHOICE OF FORUM. If any provision of the Contract shall be held invalid or unenforceable by a court of competent jurisdiction, such holding shall not invalidate or render unenforceable any other provision hereof. The Contract shall be governed by the laws of the State of California. Any action or proceeding seeking any relief under or with respect to this Agreement shall be brought solely in the Superior Court of the State of California for the County of Shasta, subject to transfer of venue under applicable State law, provided that nothing in this Agreement shall constitute a waiver of immunity to suit by Owner.

ARTICLE XVII. AMENDMENTS. The terms of the Contract shall not be waived, altered, modified, supplemented or amended in any manner whatsoever except by written agreement, including change orders, signed by the parties and approved or ratified by the Governing Board.

ARTICLE XVIII. ASSIGNMENT OF CONTRACT. The Contractor shall not assign or transfer by operation of law or otherwise any or all of its rights, burdens, duties or obligations without the prior written consent of the surety on the payment bond, the surety on the performance bond and the Owner.

ARTICLE XIX. WRITTEN NOTICE. Written notice shall be deemed to have been duly served if delivered in person to the individual or member of the firm or to an officer of the corporation for whom it was intended, or if delivered at or sent by registered or certified or overnight mail to the last business address known to the person who gives the notice.

(CONTRACTOR)

REDDING SCHOOL DISTRICT

SIGNED BY (Contractor)

(Title)

CALIFORNIA CONTRACTOR'S
LICENSE NO.

LICENSE EXPIRATION DATE

NOTE: Contractor must give the full business address of the Contractor and sign with Contractor's usual signature. Partnerships must furnish the full name of all partners and the Agreement must be signed in the partnership name by a general partner with authority to bind the partnership in such matters, followed by the signature and designation of the person signing. The name of the person signing shall also be typed or printed below the signature. Corporations must sign with the legal name of the corporation, followed by the name of the state of incorporation and by the signature and designation of the chairman of the board, president or any vice president, and then followed by a second signature by the secretary, assistant secretary, the chief financial officer or assistant treasurer. All persons signing must be authorized to bind the corporation in the matter. The name of each person signing shall also be typed or printed below the signature. Satisfactory evidence of the authority of the officer signing on behalf of a corporation shall be furnished.

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS that we, _____
_____ as Principal and
_____ as Surety, are held and
firmly bound unto _____, in the County of Shasta, State of California, hereinafter
called the "Owner", in the sum of _____ Dollars
(\$ _____) for the payment of which sum well and truly made, we bind
ourselves, our heirs, executors, administrators, and successors, jointly and severally, to
the Owner for the full performance of a certain contract with the Owner, the terms of
which are incorporated herein by reference, dated _____, 20____, for
construction of:

**MANZANITA ELEMENTARY SCHOOL MODERINZATION
1240 MANZANITA HILLS AVENUE
REDDING, CA 96001**

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

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

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

**SECTION 00 61 13.13
PERFORMANCE BOND**

IN WITNESS WHEREOF, the above-bounden parties have executed this instrument under their several seals this _____ day of _____, _____ hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

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

(Affix Corporate Seal)

(Individual Principal)

(Business Address)

(Affix Corporate Seal)

(Corporate Principal)

(Business Address)

(Affix Corporate Seal)

(Corporate Surety)

(Business Address)

By: _____

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

The total amount of premium charged is _____.

The above must be filled in by Corporate Surety.

PAYMENT BOND
(Labor and Material)

KNOW ALL MEN BY THESE PRESENTS:

That WHEREAS, Redding School District (the "Owner" of the public works project described below) and _____, hereinafter designated as the "Principal," have entered into a Contract for the furnishing of all materials and labor, services and transportation, necessary, convenient, and proper to construct:

**MANZANITA ELEMENTARY SCHOOL MODERNIZATION
1240 MANZANITA HILLS AVENUE
REDDING, CA 96001**

Which said agreement dated _____, _____, and all of the Contract Documents are hereby referred to and made a part hereof;

and

WHEREAS, the Principal is required, before entering upon the performance of the work, to file a good and sufficient bond with the body by whom the Contract is awarded to secure the claims arising under said agreement.

NOW, THEREFORE, THESE PRESENTS WITNESSETH:

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

The condition of this obligation is that if the said Principal or any of its subcontractors, or the heirs, executors, administrators, successors, or assigns of any, all, or either of them, shall fail to pay any of the persons named in Civil Code section 9100, or any of the amounts due, as specified in Civil Code section 9554, subdivision (b), that said Surety will pay the same in an amount not exceeding the amount hereinabove set forth, and also in case suit is brought upon this bond, will pay costs and reasonable attorney's fees to be awarded and fixed by the Court, and to be taxed as costs and to be included in the judgment therein rendered.

**SECTION 00 61 13.16
PAYMENT BOND**

It is hereby expressly stipulated and agreed that this bond shall inure to the benefit of any and all persons, companies, and corporations entitled to file claims so as to give a right of action to them or their assigns in any suit brought upon this bond.

Should the condition of this bond be fully performed, then this obligation shall become null and void, otherwise it shall be and remain in full force and effect.

And the said Surety, for value received, thereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of said contract or the specifications accompanying the same shall in any manner affect its obligations on this bond, and it does hereby waive notice of any such change, extension, alteration, or addition.

IN WITNESS WHEREOF, this instrument has been duly executed by the Principal and Surety this _____ day of _____, _____.

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

Principal

Surety

By: _____
Attorney-in-Fact

The above bond is accepted and approved this ____ day of _____.

NONCOLLUSION DECLARATION
TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

Owner: Redding School District

Contract for: **Manzanita Elementary School Modernization Project**

The undersigned declares:

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

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

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

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on _____, 20__, at _____ [city], _____ [state].

Signature

Print Name

WORKERS' COMPENSATION CERTIFICATE

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

I am aware of the provisions of the Labor Code Section 3700 which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the work of this contract. I shall supply the Owner with certificates of insurance evidencing that Workers' Compensation Insurance is in effect and providing that the Owner will receive thirty (30) days' notice of cancellation.

Name of Contractor

Signature

Print Name

Date

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

IRAN CONTRACTING ACT CERTIFICATION
(Public Contract Code sections 2202-2208)
(To be Executed by Bidder and Submitted With Bid)

As required by Public Contract Code (“PCC”) section 2204 for contracts of \$1,000,000 or more, please insert bidder’s or financial institution’s name and Federal ID Number (if available) and complete **one** of the options below. Please note that California law establishes penalties for providing false certifications, including civil penalties equal to the greater of \$250,000 or twice the amount of the contract for which the false certification was made; contract termination; and three-year ineligibility to bid on contracts. (PCC §2205.)

OPTION #1 - CERTIFICATION

I, the official named below, certify I am duly authorized to execute this certification on behalf of the bidder/financial institution identified below, and the bidder/financial institution identified below is **not** on the current list of persons engaged in investment activities in Iran created by California Department of General Services (“DGS”) and is not a financial institution extending twenty million dollars (\$20,000,000) or more in credit to another person/bidder, for 45 days or more, if that other person/bidder will use the credit to provide goods or services in the energy sector in Iran and is identified on the current list of persons engaged in investment activities in Iran created by DGS. (PCC §2204(a).)

<i>Bidder Name/Financial Institution (Printed)</i>		<i>Federal ID Number (or n/a)</i>
<i>By (Authorized Signature)</i>		
<i>Printed Name and Title of Person Signing</i>		
<i>Date Executed</i>	<i>Executed in</i>	

OPTION #2 – EXEMPTION

Pursuant to Public Contract Code sections 2203(c) and (d), a public entity may permit a bidder/financial institution engaged in investment activities in Iran, on a case-by-case basis, to be eligible for, or to bid on, submit a proposal for, or enters into or renews, a contract for goods and services. If you have obtained an exemption from the certification requirement under the Iran Contracting Act, please fill out the information below, and attach documentation demonstrating the exemption approval.

<i>Bidder Name/Financial Institution (Printed)</i>		<i>Federal ID Number (or n/a)</i>
<i>By (Authorized Signature)</i>		
<i>Printed Name and Title of Person Signing</i>		<i>Date Executed</i>

GENERAL CONDITIONS
for
CONTRACT OF CONSTRUCTION

FOR MANZANITA ELEMENTARY SCHOOL MODERNIZATION PROJECT

REDDING SCHOOL DISTRICT

April 16, 2019

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ARTICLE 1

GENERAL CONDITIONS

1.1 BASIC DEFINITIONS

1.1.1 THE CONTRACT DOCUMENTS

The “Contract Documents” consist of the Agreement between Owner and Contractor (hereinafter the Agreement), Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, addenda issued prior to bid, Instructions to Bidders, Notice to Bidders, the Bid Form, Payment Bond, Performance Bond, required insurance certificates, additional insured endorsement and declarations page, Designation of Subcontractors, Noncollusion Declaration, Roof Project Certification (where applicable), Sufficient Funds Declaration (Labor Code section 2810) and the Fingerprinting Notice and Acknowledgment and Independent Contractor Student Contact Form, other documents referred to in the Agreement, and Modifications issued after execution of the Agreement. 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 Owner. 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.

1.1.2 THE CONTRACT

The Contract Documents form the Contract. The “Contract” represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a written Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind between the Architect and Contractor, any Construction Manager 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 terms of the Contract shall not be waived, altered, modified, supplemented or amended in any manner whatsoever except by written agreement signed by the parties and approved or ratified by the Governing Board.

1.1.3 THE WORK

The “Work” shall include all labor, materials, services and equipment necessary for the Contractor to fulfill all of its obligations pursuant to the Contract Documents, including but not limited to punch list items and submission of documents. It shall include the initial obligation of any Contractor or Subcontractor, who performs any portion of the Work, to visit the Site of the proposed Work with Owner’s representatives, 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. The Work shall constitute a “work of improvement” under Civil Code section 8050 and Public Contract Code section 7107.

1.1.4 THE PROJECT

The “Project” is the total construction of the Work performed in accordance with the Contract Documents. However, where applicable, the Project may also include construction by the Owner or by separate contractors.

1.1.5 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.

1.1.6 THE SPECIFICATIONS

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

1.1.7 THE PROJECT MANUAL

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

1.1.8 OR

“Or” shall include “and/or.”

1.1.9 COMPLETION

Statutory definitions of “Completion” and “Complete” shall apply for those statutory purposes. For all other purposes, including accrual of liquidated damages, Claims and warranties, “Completion” and “Complete” mean the point in the Work where (1) Contractor has fully and correctly performed all Work in all parts and requirements, including corrective and punch list work, and (2) Owner’s representatives have conducted a final inspection that confirmed this performance. Substantial, or any other form of partial or non-compliant, performance shall not constitute “Completion” or “Complete”.

1.1.10 COMPLETION OF THE PROJECT

For purposes of accrual of liquidated damages for delays to the Project, *completion* shall mean the point in the Project where (1) all contractors and Owner have fully and correctly performed all work of the entire Project in all parts and requirements, including corrective and punch list work, and (2) Owner's representatives have conducted a final inspection of the entire Project that confirmed this performance. Substantial, or any other form of partial or non-compliant, performance of the entire Project shall not constitute *completion* or *complete*.

1.2 EXECUTION, CORRELATION AND INTENT

1.2.1 CORRELATION AND INTENT

1.2.1.1 ***Documents Complementary and Inclusive.*** The Contract Documents are complementary and are intended to include all items required for the proper execution and Completion of the Work. 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.

1.2.1.2 ***Coverage of the Drawings and Specifications.*** The Drawings and Specifications generally describe the work to be performed by Contractor. Generally, the Specifications describe work which cannot be readily indicated on the Drawings and indicate types, qualities, and methods of installation of the various materials and equipment required for the Work. It is not intended to mention every item of Work in the Specifications, which can be adequately shown on the Drawings, or to show on the Drawings all items of Work described or required by the Specifications even if they are of such nature that they could have been shown. All materials or labor for Work, which is shown on 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 the Drawings or the Specifications. 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 Contractor.

1.2.1.3 ***Conflicts.*** Without limiting Contractor's obligation to identify conflicts for resolution by the Owner, it is intended that the more stringent, higher quality, and greater quantity of Work shall apply.

1.2.1.4 ***Conformance With Laws.*** Each and every provision of law required by law to be inserted in this Contract shall be deemed to be inserted herein, and the Contract shall be read and enforced as though it were included herein, 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.

Before commencing any portion of the Work, Contractor shall check and review the Drawings and Specifications for such portion for conformance and compliance with all laws, ordinances, codes, rules and regulations of all governmental authorities and public 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. 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 promptly notify Architect and Owner in writing of same and shall ensure that any such violation or inconsistency shall be corrected in the manner provided hereunder prior to the construction of that portion of the Work. Where requirements of the Contract Documents exceed those of the applicable building codes and ordinances, the Contract Documents shall govern. Contractor shall comply with all applicable Federal, State and local laws.

If, as and to the extent that Public Contract Code section 1104 is deemed to apply after the award of the Contract, Contractor shall not be required to assume responsibility for the completeness and accuracy of architectural or engineering plans and specifications, notwithstanding any other provision in the Contract Documents, except to the extent that Contractor discovered or should have discovered and reported any errors and omissions to the Architect and Owner, including but not limited to as the result of any review of the plans and specifications by Contractor required by the Instructions to Bidders or other Contract Documents, whether or not actually performed by Contractor.

1.2.1.5 **Ambiguity.** 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. Contractor shall immediately notify Architect and Owner in writing of any perceived or alleged error, inconsistency, ambiguity, or lack of detail or explanation in the Drawings and Specifications in the manner provided herein. If the Contractor or its Subcontractors, material or equipment suppliers, or any of their officers, agents, and employees performs, permits, or causes the performance of any Work under the Contract Documents, which it knows or should have known to be in error, inconsistent, or ambiguous, or not sufficiently detailed or explained, Contractor shall bear any and all costs arising therefrom including, without limitation, the cost of correction thereof without increase or adjustment to the Contract Sum or the time for performance. 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 Sum or the time for performance. In no case shall any Subcontractor proceed with the Work if uncertain without the Contractor's written direction and/or approval.

1.2.1.6 **Execution.** Execution of the Agreement Between Owner and Contractor by the Contractor is a representation that the Contractor has visited the Site, become familiar with the local conditions under which the Work is to be performed and has correlated personal observations with the requirements of the Contract Documents.

1.2.2 ADDENDA AND DEFERRED APPROVALS

1.2.2.1 **Addenda.** Subsequent addenda issued shall govern over prior addenda only to the extent specified. In accordance with Title 24, California Code of Regulations, addenda shall be approved by the Division of the State Architect (“DSA”).

1.2.2.2 **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.

1.2.3 SPECIFICATION INTERPRETATION

1.2.3.1 **Titles.** The Specifications are separated into titled sections for convenience only and not to dictate or determine the trade or craft involved. Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of work to be performed by any trade.

1.2.3.2 **As Shown, Etc.** Where “as shown,” “as indicated,” “as detailed,” or words of similar import are used, reference is made to the Drawings accompanying the Specifications unless otherwise stated. Where “as directed,” “as required,” “as permitted,” “as authorized,” “as accepted,” “as selected,” or words of similar import are used, the direction, requirement, permission, authorization, approval, acceptance, or selection by Architect is intended unless otherwise stated.

1.2.3.3 **Provide.** “Provide” means “provided complete in place,” that is, furnished, installed, tested, and ready for operation and use.

1.2.3.4 **General Conditions.** The General Conditions and any supplementary general conditions are a part of each and every section of the Specifications.

1.2.3.5 **Abbreviations.** In the interest of brevity, the Specifications are written in an abbreviated form and may not include complete sentences. Omission of words or phrases such as “Contractor shall,” “shall be,” etc., are intentional. Nevertheless, the requirements of the Specifications are mandatory. Omitted words or phrases shall be supplied by inference in the same manner as they are when a “note” occurs on the Drawings.

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

1.2.3.7 **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.”

1.2.3.8 **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 as of the date the Notice to Bidders is first published. If applicable specifications are revised prior to completion of any part of the Work, the Contractor may, if acceptable to Owner and Architect, perform such Work in accordance with the revised specifications. The standard specifications, except as modified in the Specifications for the Project, shall have full force and effect as though printed in the Specifications. Architect will furnish, upon request, information as to how copies of the standard specifications referred to may be obtained.

1.2.3.9 **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 is not intended to affect the interpretation of either statement.

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

The Drawings, Specifications, and other documents prepared on behalf of the Owner are instruments of the services of the Architect and its consultants and are the property of the Owner. The Contractor may retain one contract record set. Neither the Contractor nor any Subcontractor, Sub-subcontractor, or material or equipment supplier shall own or claim a copyright in the Drawings, Specifications, and other documents prepared by the Architect, and unless otherwise indicated the Architect shall be deemed the author of them. All copies of them, except the Contractor's record set, shall be returned or suitably accounted for to the Owner, upon request upon Completion of the Work. The Drawings, Specifications, and other documents prepared by the Architect, and copies thereof furnished to the Contractor, are for use solely with respect to this Contract. They are not to be used by the Contractor or any Subcontractor, Sub-subcontractor, or material or equipment supplier on other contracts or projects or for additions to this Contract or Project outside the scope of the Work without the specific written consent of the Owner and the Architect. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers are granted a limited license to use and reproduce applicable portions of the Drawings, Specifications, and other documents prepared by the Architect appropriate to and for use in the execution of their Work under the Contract Documents. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with this Project is not to be construed as publication in derogation of the Owner's property interest or other reserved right. All copies made under this license shall bear appropriate attribution and the statutory copyright notice, if any, shown on the Drawings, Specifications and other documents prepared by the Architect.

ARTICLE 2

OWNER

2.1 DEFINITION

The term “Owner” means the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The term “Owner” means the Owner and/or the Owner’s authorized representatives, including but not limited to architects and construction managers. To the extent the Contract Documents indicate that Owner has assigned duties to particular representatives of the Owner (such as the Architect, or any construction manager), Owner reserves the right at all times to reassign such duties to different Owner representatives.

2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

2.2.1 INTENTIONALLY LEFT BLANK

2.2.2 SITE SURVEY

When required by the scope of the Project, the Owner will furnish, at its expense, a legal description or a land survey of the Site, giving, as applicable, grades and lines of streets, alleys, pavements, adjoining property, rights-of-way, restrictions, easements, encroachments, zoning, deed restrictions, boundaries, and contours of the Site. Surveys to determine locations of construction, grading, and Site work shall be provided by the Contractor.

2.2.3 SOILS

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

2.2.3.2 *Contractor Reliance.* Test borings and soils reports for the Project have been made for the Owner to indicate the subsurface materials that might be encountered at particular locations on the Project. The Owner has made these documents available to the Contractor and the Contractor has studied the results of such test borings and information that it has as to the subsurface conditions and Site geology as set forth in the test borings and soils reports. The Owner does not assume any responsibility whatsoever with respect to the sufficiency or accuracy of the borings made, or of the logs of the test borings, or of other investigations, or of the soils reports furnished pursuant hereto, or of the interpretations to be made beyond the location or depth of the borings. There is no warranty or guarantee, either express or implied that the conditions indicated by such investigations, borings, logs, soil reports or other information are representative of those existing throughout the Site of the Project, or any part thereof, or that

unforeseen developments may not occur. At the Owner's request, the Contractor shall make available to the Owner the results of any Site investigation, test borings, analyses, studies or other tests conducted by or in the possession of the Contractor or any of its agents. Nothing herein contained shall be deemed a waiver by the Contractor to pursue any available legal right or remedy it may have at any time against any third party who may have prepared any report and/or test relied upon by the Contractor.

2.2.4 UTILITY SURVEY

When required by the scope of the Project, the Owner will furnish, at its expense, all information regarding known existing utilities on or adjacent to the Site, including location, size, inverts, and depths.

2.2.5 INFORMATION

Upon the request of the Contractor, Owner will make available such existing information regarding utility services and Site features, including existing construction, related to the Project as is available from Owner's records. The Contractor may not rely upon the accuracy of any such information, other than that provided under Sections 2.2.2 and 2.2.4 (except that the Contractor may not rely upon and must question in writing to the Owner and the Architect any information which appears incorrect based upon Contractor's Site inspection, knowledge of the Work and Project, and prior experience with similar projects), unless specifically stated in writing that the Contractor may rely upon the designated information.

2.2.6 EXISTING UTILITY LINES; REMOVAL, RELOCATION

2.2.6.1 *Removal, Relocation.* Pursuant to Government Code section 4215, the Owner assumes the responsibility for removal, relocation, and protection of utilities located on the Site at the time of commencement of construction under this Contract with respect to any such utility facilities which are not identified in the drawings and specifications made part of the invitation to bid. The Contractor shall not be assessed for liquidated damages for delay in Completion of the Work caused by failure of the Owner to provide for removal or relocation of such utility facilities. Owner shall compensate the Contractor for the costs of locating, repairing damage not due to the failure of the Contractor to exercise reasonable care, removing or relocating such utility facilities, and for equipment necessarily idle during such work.

2.2.6.2 *Assessment.* These subparagraphs shall not be construed to preclude assessment against the Contractor for any other delays in Completion of the Work. Nothing in these subparagraphs shall be deemed to require the Owner to indicate the presence of existing service laterals or appurtenances whenever the presence of such utilities on the Site can be inferred from the presence of other visible facilities, such as buildings, or meter junction boxes on or adjacent to the Site.

2.2.6.3 *Notification.* If the Contractor, while performing work under this Contract, discovers utility facilities not identified by the Owner in the Contract plans or specifications, Contractor shall immediately notify the Owner and the utility in writing.

2.2.6.4 *Underground Utility Clearance.* It shall be Contractor's sole responsibility to timely notify all public and private utilities serving the Site prior to commencing work. The Contractor shall notify and receive clearance from any cooperative agency, such as Underground Service Alert, in accordance with Government Code section 4216, et seq. Contractor shall promptly provide a copy of all such notifications to the Owner.

2.2.7 EASEMENTS

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

2.2.8 REASONABLE PROMPTNESS

Information or services under Owner's control will be furnished by the Owner with reasonable promptness. The Owner shall not be liable for any delays caused by factors beyond the Owner's control including but not limited to DSA's or any other local, State or federal agency's review of bids, change order requests, RFI's or any other documents.

2.2.9 COPIES FURNISHED

The Contractor will be furnished such copies of Drawings and Project Manuals as are stated in the Contract Documents.

2.2.10 DUTIES CUMULATIVE

The foregoing are in addition to other duties and responsibilities of the Owner enumerated herein, and especially those in Article 6 (Construction by Owner or by Separate Contractors), Article 9 (Payments and Completion), and Article 11 (Insurance and Bonds).

2.3 OWNER'S RIGHT TO STOP THE WORK

If the Contractor fails to correct Work which is not in accordance with the requirements of the Contract Documents, or persistently fails to carry out Work in accordance with the Contract Documents, the Owner, after providing Notice pursuant to paragraph 2.4, may order the Contractor to stop the Work or any portion thereof, until the Contractor corrects the deficiencies. The right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Article 6.

2.4 OWNER'S RIGHT TO CARRY OUT THE WORK

If the Contractor fails or refuses to carry out the Work in accordance with the Contract Documents, Owner may correct such deficiencies by whatever reasonable method the Owner may deem expedient without prejudice to other remedies the Owner may have, including but not limited to having another contractor perform some or all of the Work without terminating the

Contract with Contractor. Owner may exercise this right at any time during the Contractor's Work.

Owner shall first provide written notice to Contractor of Contractor's failure or refusal to perform. The notice will provide the time period within which Contractor must begin correction of the failure or refusal to perform. If the Contractor fails to begin correction within the stated time, or fails to continue correction, the Owner may proceed to correct the deficiencies. In the event the Owner bids the work, Contractor shall not be eligible for the award of the contract. The Contractor may be invoiced the cost to Owner of the work, including compensation for additional professional and internally generated services and expenses made necessary by Contractor's failure or refusal to perform. Owner may withhold that amount from the retention, or progress payments due the Contractor, pursuant to Section 9.5. If retention and payments withheld then or thereafter due the Contractor are not sufficient to cover that amount, the Contractor shall pay the difference to the Owner.

ARTICLE 3

THE CONTRACTOR

3.1 DEFINITION

The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The term "Contractor" means the Contractor or the Contractor's authorized representative. To the extent that any portion of the Work is provided with the Contractor's own forces, any reference to Subcontractors shall be equally applicable to the Contractor.

3.2 SUPERVISION AND CONSTRUCTION PROCEDURES

3.2.1 CONTRACTOR

The Contractor shall supervise and direct the Work using the Contractor's best skill and attention, which shall meet or exceed the standards in the industry. The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences, procedures, and coordinating all portions of the Work under the Contract, unless Contract Documents give other specific instructions concerning these matters.

If part of the Project is performed by other contractors Owner directly retains, and the Owner does not retain a construction manager for the Project, Contractor shall be responsible for the coordination and sequencing of its Work with those other contractors so as to avoid any impact on the Contract schedule pursuant to the requirements of Article 6. If Contractor fails to fulfill these obligations, Owner may exercise its rights under section 2.4. The right of Owner to carry out the Work under section 2.4 shall not give rise to a duty on the part of Owner to exercise this right for the benefit of Contractor or any other person or entity, except to the extent required by section 6.1.4.

If part of the Project is performed by other contractors Owner directly retains, and Owner retains a construction manager, the construction manager shall schedule and coordinate the activities of Contractor with the other contractors and Owner. Contractor agrees to accept the Owner's, and any construction manager's, construction schedules, schedule updates, overall sequence and coordination of construction for the Project.

Contractor realizes that work by other contractors or Owner may occur simultaneously with Contractor's Work in any given area. Contractor is responsible for its own sequences within a given activity or set of activities. Contractor shall not commit, or permit, any act which will adversely affect the work of any other contractor or Owner. Contractor shall provide layout of its Work at the request of any other contractor or Owner.

Specific duties of the Contractor shall be in accordance with Title 24 of the California Code of Regulations. Contractor shall fully comply with any and all reporting requirements of Education Code sections 17309 and 81141 in the manner prescribed by Title 24.

3.2.2 CONTRACTOR RESPONSIBILITY

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

3.2.3 OBLIGATIONS NOT CHANGED BY OTHERS' ACTIONS

The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents by the activities or duties of the Owner's representatives, including but not limited to any construction manager and the Architect, or the Inspector of Record; or by tests, inspections, or approvals required or performed by persons other than the Contractor.

3.2.4 CONTRACTOR RESPONSIBILITY FOR READINESS FOR WORK

The Contractor shall be responsible for inspection of Work already performed under the Contract Documents to determine that such portions are in proper condition to receive subsequent work.

3.2.5 PROJECT MEETINGS

During its Work, Contractor shall attend Owner's Project meetings as scheduled by the Contract Documents, or as otherwise instructed by Owner, to discuss the current status of the Work and Project and the future progress of the Work and the Project. Contractor shall have five (5) days after receipt of Owner's Project meeting minutes to provide written objections and suggested corrections.

3.3 SUPERINTENDENT

3.3.1 FULL TIME SUPERINTENDENT

The Contractor shall provide a competent superintendent and assistants as necessary, all of whom shall be reasonably proficient in speaking, reading and writing English and, who shall be in attendance at the Project Site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

3.3.2 STAFF

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

3.3.3 RIGHT TO REMOVE

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

3.4 LABOR AND MATERIALS

3.4.1 CONTRACTOR TO PROVIDE

Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, material, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and Completion of the Work whether temporary or permanent and whether or not incorporated or to be incorporated in the Work. Owner shall have no responsibility for security of, or repair or replacement costs of, any and all material, equipment, tools, construction equipment, and machinery provided by Contractor pursuant to this Subsection.

3.4.2 QUALITY

Unless otherwise specified, all materials and equipment to be permanently installed in the Project shall be new and shall be of such quality as required to satisfy the standards of the Contract Documents. The Contractor shall, if requested, promptly furnish satisfactory evidence as to kind and quality of all materials and equipment. All labor shall be performed by workers skilled in their respective trades, and the quality of their work shall meet whichever is the higher standard for their work: the standard in the industry or the standard in the Contract Documents.

3.4.3 REPLACEMENT

Any work, materials, or equipment, which does not conform to these standards may be disapproved and rejected by the Owner, in which case, they shall be removed and replaced by the Contractor at no cost to the Owner.

3.4.4 DISCIPLINE

The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Contract in accordance with paragraph 5.5.1 including, but not limited to, Subcontractors, and material or equipment suppliers retained for the Project.

3.5 WARRANTY

For the period of one (1) year after Completion of the Work (see Sections 9.7.1, 12.2.5 and 12.2.6), the Contractor warrants to the Owner that material and equipment furnished under the Contract will be of good 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 Owner, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

3.6 TAXES

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

3.7 PERMITS, FEES AND NOTICES

3.7.1 PAYMENT

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

3.7.2 COMPLIANCE

The Contractor shall comply with and give notices required by any law, ordinance, rule, regulation, and lawful order of public authorities bearing on performance of the Work.

3.7.3 CONTRACT DOCUMENTS

It is not the Contractor's responsibility to ascertain that the Contract Documents are in accordance with any applicable law, statute, ordinance, building codes, rule, or regulation. However, if the Contractor knew, or should have known, or observes that portions of the Contract Document are at variance therewith, the Contractor shall promptly notify the Architect, any construction manager, and Owner in writing, and necessary changes shall be accomplished by appropriate modification.

3.7.4 RESPONSIBILITY

If the Contractor performs any work that it knows, or should have known, is contrary to any law, statute, ordinance, building code, rule or regulation, the Contractor shall assume full responsibility for such work, and shall bear the attributable cost of correction and delays to the Work, other contractors' work, and the Project.

3.8 ALLOWANCES

3.8.1 CONTRACT

The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities against whom the Contractor makes reasonable and timely objection.

3.8.2 SCOPE

3.8.2.1 **Prompt Selection.** Materials and equipment under an allowance shall be selected promptly by the Owner to avoid delay to the Work.

3.8.2.2 **Cost.** Allowances shall cover the cost to the Contractor of materials and equipment delivered at the Site and all required taxes, less applicable trade discounts, etc., as delineated in paragraph 7.7.4.

3.8.2.3 **Cost Included in Contract Sum.** Contractor's costs for unloading and handling at the Site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum and not in the allowances.

3.8.2.4 **Contract Sum Adjustment.** Whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of

the Change Order shall reflect the difference between actual cost and the allowances under paragraph 3.8.2.2 and the change in the Contractor's costs under paragraph 3.8.2.3.

3.9 CONTRACTOR'S CONSTRUCTION SCHEDULES

3.9.1 REQUIREMENTS

Before the Contractor's commencement of Work or within two (2) weeks of award of the Contract, whichever is earlier, Contractor shall prepare and submit for the Owner's, and any construction manager's, information the baseline construction schedule for the Work, which shall conform to the Contract Documents' requirements.

Contractor shall submit a monthly updated schedule of the Work that will include an accurate as-built schedule and the current as-planned schedule, both of which shall conform to the Contract Documents' requirements. Contractor shall submit its daily logs for the prior month with the updated schedule.

The schedule and updates shall conform, at a minimum, to industry standards for critical path scheduling and shall facilitate Owner's Project management and evaluation of Contractor Claims for additional money or time.

The schedule and updates shall not exceed time limits (including milestone deadlines) under the Contract Documents and shall comply with the Contract Documents scheduling requirements and with any scheduling requirements the Owner provides to the Contractor at the beginning of the Work. The original schedule and all updates shall accurately reflect work performed to date, all construction tasks (including procurement), the critical path schedule for Completion of the remainder of the Work, and the percentage of the Work completed. The original schedule and updates shall include all delay days for weather not unusually severe, even though that weather will not entitle Contractor to additional time or money.

The construction schedule shall be in the form of either a tabulation, chart, or graph, unless otherwise stated in Division 1 of the Specifications, and shall be in sufficient detail to show the chronological relationship of all activities of the Project including, but not limited to, estimated starting and completion dates of various activities, (including early and late dates and reasonable float for each activity), procurement of materials, the critical path, and scheduling of equipment. Float suppression techniques such as preferential sequencing, special lead/lag logic restraints, extended activity durations, or imposed dates shall be apportioned for the benefit of the Project. Whenever in the Contract Documents Contractor is required to provide a schedule and/or schedule updates, the Contractor shall provide the schedule and updates in electronic format as well as hard copy. Contractor shall be solely responsible for the accuracy, utility and reasonableness of all of its schedules. Owner's acceptance, approval or non-rejection of Contractor's schedules shall not affect Contractor's responsibility for its schedules.

The Contractor and Owner shall use any float on a "first come, first served" basis. The original schedule and updates shall reflect Contractor's and Owner's use of float. Float is not for the exclusive use or benefit of either Owner or Contractor, but it is a jointly owned expiring Project

resource available to both parties as needed to meet schedule milestones. For the original schedule and updates, Contractor shall use a critical path network format with the critical paths clearly indicated. Contractor shall use an MS Project, Primavera, or an equivalent or better program. Contractor shall include reports that sort and list the activities in order of increasing float and by early and late start dates. Contractor shall endeavor to label ten to thirty percent (10-30%) of the tasks as critical, but shall not label less than five (5%) or more than fifty (50%) as critical. Contractor shall use calendar days.

If any change in Contractor's method of operations will cause a change in the construction schedule, Contractor shall submit to Owner, Architect, and any construction manager, a revised construction schedule within seven (7) days of the change, unless a different time period is stated in Division 1 of the Specifications.

If, in the Owner's opinion, the Contractor is not prosecuting the Work at a rate sufficient to meet the Work schedule or a contractual milestone, or to Complete the Work within the Contract Time (as adjusted by change orders) or if the Contractor's actual progress falls behind the Work schedule or it is apparent to Owner or Contractor that Contractor will not meet contractual milestones or Complete the Work within the Contract Time (as adjusted by change orders), the Owner may require that the Contractor prepare and submit a recovery plan. Contractor must submit a recovery plan within seven (7) days of a demand for the plan, unless a different time period is stated in Division 1 of the Specifications. At a minimum, the recovery plan must include a revised schedule that gets the Work back on schedule and Completes all Work by the contractual milestones and within the Contract Time (as adjusted by change orders) or by other dates Owner specifies in the demand for a recovery plan. The recovery plan shall state the corrective actions Contractor will undertake to implement it. The recovery plan shall also list any additional money that Contractor believes it should receive if Owner orders Contractor to fully or partially implement the recovery plan. If the Owner orders Contractor to implement the recovery plan, Contractor shall do so, but the order shall not constitute an admission by Owner that Contractor is entitled to additional money. To recover additional money, Contractor must comply with General Conditions Articles 4.5, 7 and 8.

All schedules Contractor submits shall be certified as true and correct, as follows:

I, _____[name of declarant], declare the following:

_____ [Contractor company name] has entered into a Contract with _____ [public entity name] on the _____ [name of project] Project. _____ [Contractor company name] authorized me to prepare the schedules for _____ [public entity name] for _____ [Contractor company name] Work on the Contract, and I prepared the attached schedule. I am the most knowledgeable person at _____ [Contractor company name] regarding the scheduling of the Work for this Contract.

The attached schedule does not breach the Contract between _____ [Contractor company name] and _____ [public entity name] for this Project, does not violate any applicable law, satisfies all provisions of the Contract

applicable to submission of schedules, only contains truthful and accurate as-built and as-planned dates of work on the Contract (including supporting data), and is not a false claim.

The attached schedule is submitted in compliance with all laws applicable to submission of a Claim, including but not limited to California Penal Code section 72 (Fraudulent Claims), Government Code sections 12650 et seq. (False Claims Act; for example, Government Code section 12651(a)(7)), and Business and Professions Code sections 17200 et seq. (Unfair Business Practices Act). I am aware that submission or certification of false claims, or other Claims that violate law or the Contract, may lead to fines, imprisonment, and/or other serious legal consequences for myself and/or _____ [Contractor company name].

While preparing this declaration and schedule I consulted with others (including attorneys, consultants, or others who work for _____ [Contractor company name]) when necessary to ensure that the statements were true and correct.

I declare under the penalty of perjury under the laws of the State of California that the foregoing is true and correct. Executed _____, 20__, at _____, California.

_____[name of declarant]

3.9.2 DSA OVERSIGHT PROCESS

In connection with the DSA Construction Oversight Process which includes inspection cards and review of changes to the DSA-approved construction documents, the Contractor must (a) include specific tasks in its baseline schedule to take into account these procedures since they are critical path issues; and (b) include a reasonable amount of float in the baseline schedule to accommodate the additional time required by these DSA procedures.

3.9.3 FAILURE TO MEET REQUIREMENTS

Failure of the Contractor to provide proper schedules may, at the sole discretion of Owner, constitute either grounds to withhold, in whole or in part, progress payments to the Contractor, or a breach of contract allowing Owner to terminate the Contract.

3.10 DOCUMENTS AND SAMPLES AT THE SITE

The Contractor shall maintain at the Site for the Owner one applicable copy of Titles 19 and 24 and record copy of the Drawings, Specifications, Addenda, Change Orders, and other Modifications, in good order and marked currently to record changes and selections made during construction. In addition, the Contractor shall maintain at the Site approved Shop Drawings,

Product Data, Samples, and similar required submittals. These documents shall be available to the Owner and shall be delivered to the Owner, or the Architect for delivery to the Owner, upon Completion of the Work.

3.11 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

3.11.1 SUBMITTALS DEFINED

3.11.1.1 **Shop Drawings.** The term “shop drawings” as used herein means drawings, diagrams, schedules, and other data, which are prepared by Contractor, Subcontractors, manufacturers, suppliers, or distributors illustrating some portion of the Work, and includes: illustrations; fabrication, erection, layout and setting drawings; manufacturer’s standard drawings; schedules; descriptive literature, instructions, catalogs, and brochures; performance and test data including charts; wiring and control diagrams; and all other drawings and descriptive data pertaining to materials, equipment, piping, duct and conduit systems, and methods of construction as may be required to show that the materials, equipment, or systems and their position conform to the requirements of the Contract Documents. The Contractor shall obtain and submit with the shop drawings all seismic and other calculations and all product data from equipment manufacturers. “Product data” as used herein are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate a material, product, or system for some portion of the Work. As used herein, the term “manufactured” applies to standard units usually mass-produced, and “fabricated” means items specifically assembled or made out of selected materials to meet individual design requirements. Shop drawings shall: establish the actual detail of all manufactured or fabricated items, indicate proper relation to adjoining work, amplify design details of mechanical and electrical systems and equipment in proper relation to physical spaces in the structure, and incorporate minor changes of design or construction to suit actual conditions.

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

3.11.1.3 **Contractor’s Responsibility.** Contractor shall obtain and shall submit to Architect all required shop drawings and samples in accordance with Contractor’s “Schedule for

Submission of Shop Drawings and Samples” provisions in Division 1 of the Specifications and in accordance with the Contractor’s original and updated schedules, and with such promptness as to cause no delay in its own Work or in that of any other contractor, Owner or subcontractor but in no event later than ninety (90) days after the execution of the Agreement. Contractor may be assessed \$100 a day for each day it is late in submitting a shop drawing or sample. No extensions of time will be granted to Contractor or any Subcontractor because of its failure to have shop drawings and samples submitted in accordance with the Schedule. Each Subcontractor shall submit all shop drawings, samples, and manufacturer’s descriptive data for the review of the Owner, the Contractor, and the Architect through the Contractor. By submitting shop drawings, product data, and samples, the Contractor or submitting party (if other than Contractor) represents that it has determined and verified all materials, field measurements, field conditions, catalog numbers, related field construction criteria, and other relevant data in connection with each such submission, and that it has checked, verified, and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents. At the time of submission, any deviation in the shop drawings, product data, or samples from the requirements of the Contract Documents shall be narratively described in a transmittal accompanying the submittal. However, submittals shall not be used as a means of requesting a substitution, the procedure for which is defined in paragraph 3.11.4, “Substitutions.” Review by Owner and Architect shall not relieve the Contractor or any Subcontractor from its responsibility in preparing and submitting proper shop drawings in accordance with the Contract Documents. Contractor shall stamp, sign, and date each submittal indicating its representation that the submittal meets all of the requirements of the Contract Documents. Any submission, which in Owner’s or Architect’s opinion is incomplete, contains numerous errors, or has been checked only superficially by Contractor will be returned unreviewed for resubmission by the Contractor.

3.11.1.4 ***Extent of Review.*** In reviewing shop drawings, the Owner will not verify dimensions and field conditions. The Architect will review and approve shop drawings, product data, and samples for aesthetics and for conformance with the design concept of the Work and the information given in the Contract Documents. The Architect’s review shall neither be construed as a complete check nor relieve the Contractor, Subcontractor, manufacturer, fabricator, or supplier from responsibility for any deficiency that may exist or from any departures or deviations from the requirements of the Contract Documents unless the Contractor has, in writing, called the Architect’s attention to the deviations at the time of submission and the Architect has given specific written approval. The Architect’s review shall not relieve the Contractor or Subcontractors from responsibility for errors of any sort in shop drawings or schedules, for proper fitting of the Work, or from the necessity of furnishing any Work required by the Contract Documents, which may not be indicated on shop drawings when reviewed. Contractor and Subcontractors shall be solely responsible for determining any quantities, whether or not shown on the shop drawings.

3.11.2 **DRAWING SUBMISSION PROCEDURE**

3.11.2.1 ***Transmittal Letter and Other Requirements.*** All shop drawings must be properly identified with the name of the Project and Contractor’s name and dated, and each lot submitted must be accompanied by a letter of transmittal referring to the name of the Project and

Contractor and to the Specification section number for identification of each item clearly stating in narrative form, as well as “clouding” on the submissions, all qualifications, departures, or deviations from the Contract Documents, if any. Shop drawings, for each section of the Work, shall be numbered consecutively, and the numbering system shall be retained throughout all revisions. All Subcontractor submissions shall be made through the Contractor. Each drawing shall have a clear space for the stamps of Architect and Contractor. Only shop drawings required to be submitted by the Contract Documents shall be reviewed.

3.11.2.2 **Copies Required.** Each submittal shall include one (1) legible, reproducible sepia and five (5) legible prints of each drawing, including fabrication, erection, layout and setting drawings, and such other drawings as required under the various sections of the Specifications until final acceptance thereof is obtained. Subcontractor shall submit copies, in an amount as requested by the Contractor, of: manufacturers’ descriptive data for materials, equipment, and fixtures, including catalog sheets showing dimensions, performance, characteristics, and capacities; wiring diagrams and controls; schedules; all seismic calculations and other calculations; and other pertinent information as required.

3.11.2.3 **Corrections.** The Contractor shall make any corrections required by Architect and shall resubmit as required by Architect the required number of corrected copies of shop drawings or new samples until approved. Contractor shall direct specific attention in writing or on resubmitted shop drawings to revisions other than the corrections required by the Architect on previous submissions. Professional services required for more than one (1) re-review of required submittals of shop drawings, product data, or samples are subject to charge to the Contractor pursuant to paragraph 4.4.

3.11.2.4 **Approval Prior to Commencement of Work.** No portion of the Work requiring a shop drawing or sample submission shall be commenced until the submission has been reviewed by Owner and approved by Architect unless specifically directed in writing by the Owner. All such portions of the Work shall be in accordance with approved shop drawings and samples.

3.11.3 SAMPLE SUBMISSIONS PROCEDURE

3.11.3.1 **Samples Required.** In case a considerable range of color, graining, texture, or other characteristics may be anticipated in finished products, a sufficient number of samples of the specified materials shall be furnished by the Contractor to indicate the full range of characteristics, which will be present in the finished products; and products delivered or erected without submittal and approval of full range samples shall be subject to rejection. Except for range samples, and unless otherwise called for in the various sections of the Specifications, samples shall be submitted in duplicate. All samples shall be marked, tagged, or otherwise properly identified with the name of the submitting party, the name of the Project, the purpose for which the samples are submitted, and the date and shall be accompanied by a letter of transmittal containing similar information, together with the Specification section number for identification of each item. Each tag or sticker shall have clear space for the review stamps of Contractor and Architect.

3.11.3.2 **Labels and Instructions.** Samples of materials, which are generally furnished in containers bearing the manufacturers' descriptive labels and printed application instructions, shall, if not submitted in standard containers, be supplied with such labels and application instructions.

3.11.3.3 **Architect's Review.** The Architect will review and, if appropriate, approve submissions and will return them to the Contractor with the Architect's stamp and signature applied thereto, indicating the appropriate action in compliance with the Architect's standard procedures.

3.11.3.4 **Record Drawings and Annotated Specifications.** The Contractor will prepare and maintain on a current basis an accurate and complete set of Record Drawings showing clearly all changes, revisions, and substitutions during construction, including, without limitation, field changes and the final location of all mechanical equipment, utility lines, ducts, outlets, structural members, walls, partitions, and other significant features, and Annotated Specifications showing clearly all changes, revisions, and substitutions during construction. A copy of such Record Drawings and Annotated Specifications will be delivered to Owner in accordance with the schedule prepared by Contractor. In the event of a specification that allows Contractor to elect one of several brands, makes, or types of material or equipment, the annotations shall show which of the allowable items the Contractor has furnished. The Contractor will update the Record Drawings and Annotated Specifications as often as necessary to keep them current but no less often than weekly. The Record Drawings and Annotated Specifications shall be kept at the Site and available for inspection by the Owner, Inspector of Record and the Architect. On Completion of the Contractor's Work and prior to Application for Final Progress Payment, the Contractor will provide one complete set of Record Drawings and Annotated Specifications to the Owner, certifying them to be a complete and accurate reflection of the actual construction conditions of the Work.

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

3.11.3.6 **Owner's Property.** All shop drawings and samples submitted shall become the Owner's property.

3.11.4 SUBSTITUTIONS

3.11.4.1 ***One Product Specified.*** Unless the Specifications state that no substitution is permitted, whenever in the Contract Documents any specific article, device, equipment, product, material, fixture, patented process, form, method, or type of construction is indicated or specified by name, make, trade name, or catalog number, with or without the words “or equal,” such specification shall be deemed to be used for the purpose of facilitating description of material, process, or article desired and shall be deemed to be followed by the words “or equal.” Contractor may, unless otherwise stated, offer any material, process, or article, which shall be substantially equal or better in every respect to that so indicated or specified and will completely accomplish the purpose of the Contract Documents.

3.11.4.2 ***Two or More Products Specified.*** When two or more acceptable products are specified for an item of the Work, the choice will be up to the Contractor. Contractor shall utilize the same product throughout the Project. If a timely substitution request as set forth in Section 3.11.4.3 is not provided and an “or equal” substitution is requested, the Owner may consider the substitution if the product specified is no longer commercially available. If the Owner allows the substitution to be proposed pursuant to such an untimely request, the Contractor will be responsible for the professional fees incurred by the Architect or Architect’s consultants in reviewing the proposed substitution which fees may be withheld from progress payments and/or retention.

3.11.4.3 ***Substitution Request Form.*** Requests for substitutions of products, materials, or processes other than those specified must be made on the Substitution Request form available from the Owner prior to the date of the bid opening. Any Requests submitted less than fourteen (14) days prior to the date of the bid opening will not be considered, except as noted in paragraph 3.11.4.2. A Substitution Request must be accompanied by evidence as to whether or not the proposed substitution: is equal in quality and serviceability to the specified item; will entail no changes in detail and construction of related work; will be acceptable in consideration of the required design and artistic effect; will provide no cost disadvantage to Owner; and will require no excessive or more expensive maintenance, including adequacy and availability of replacement parts. The burden of proof of these facts shall be upon the Contractor. The Contractor shall furnish with its request sufficient information to determine whether the proposed substitution is equivalent including but not limited to all drawings, specifications, samples, performance data, calculations, and other information as may be required to assist the Architect and the Owner in determining whether the proposed substitution is acceptable. The final decision shall be the Owner’s. The written approval of the Owner, consistent with the procedure for Change Orders, shall be required for the use of a proposed substitute material. Owner may condition its approval of the substitution upon delivery to Owner of an extended warranty or other assurances of adequate performance of the substitution. If Contractor requests substitutions that require approval by the Division of the State Architect (“DSA”) or another governmental entity with jurisdiction, Contractor shall bear all risks of delay.

3.11.4.4 ***List of Manufacturers and Products Required.*** The Subcontractor shall prepare and submit to the Contractor within thirty (30) days of execution of the Subcontract comprehensive lists, in quadruplicate, of the manufacturers and products proposed for the

Project, including information on materials, equipment, and fixtures required by the Contract Documents, as may be required for Contractor's or Architect's preliminary approval. Approval of such lists of products shall not be construed as a substitute for the shop drawings, manufacturer's descriptive data, and samples, which are required by the Contract Documents, but rather as a base from which more detailed submittals shall be developed for the final review of the Contractor and the Architect.

3.11.5 DEFERRED APPROVALS

Deferred approvals shall be submitted and processed pursuant to the requirements of Division 1 of the Specifications. All risks of delay due to the Division of the State Architect's, or any other governmental agency having jurisdiction, approval of a deferred approval shall be on the requesting party.

3.12 CUTTING AND PATCHING

3.12.1 SCOPE

The Contractor shall be responsible for cutting, fitting, or patching required to Complete the Work or to make its parts fit together properly.

3.12.2 CONSENT

The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or a separate contractor by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter such construction by the Owner or a separate contractor except with written consent of the Owner and of such separate contractor; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the Owner or a separate contractor the Contractor's consent to cutting or otherwise altering the Work. All cutting shall be done promptly, and all repairs shall be made as necessary.

3.12.3 STRUCTURAL MEMBERS

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

3.12.4 SUBSEQUENT REMOVAL

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

Any costs caused by defective or ill-timed cutting or patching shall be borne by the person or entity responsible.

3.13 CLEANING UP

3.13.1 CONTRACTOR'S RESPONSIBILITY

The Contractor shall keep the Site and surrounding area free from accumulation of waste material or rubbish caused by operations under the Contract. The Site shall be maintained in a neat and orderly condition. All crates, cartons, paper, and other flammable waste materials shall be removed from Work areas and properly disposed of at the end of each day. The Contractor shall continuously remove from and about the Site the waste materials, rubbish, tools, construction equipment, machinery, and materials no longer required for the Work.

3.13.2 FAILURE TO CLEANUP

If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so, without prior notice to the Contractor and the cost thereof shall be invoiced to the Contractor and withheld from progress payments and/or retention. Each Subcontractor shall have the responsibility for the cleanup of its own Work. If the Subcontractor fails to clean up, the Contractor must do so.

3.13.3 CONSTRUCTION BUILDINGS

When directed by the Owner or the Architect, Contractor and Subcontractor shall dismantle temporary structures, if any, and remove from the Site all construction and installation equipment, fences, scaffolding, surplus materials, rubbish, and supplies belonging to Contractor or Subcontractor. If the Contractor does not remove the tools, equipment, machinery, and materials within fifteen (15) days after Completion of its Work, then they shall be deemed abandoned, and the Owner can dispose of them for its own benefit in whatever way it deems appropriate. Contractor shall pay for any costs to dispose of the items.

3.14 ACCESS TO WORK

The Contractor shall provide the Owner, the Architect, and the Inspector of Record, access to the Work in preparation and progress wherever located.

3.15 ROYALTIES AND PATENTS

3.15.1 PAYMENT AND INDEMNITY

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims of infringement of patent rights and shall hold the Owner and the Architect harmless and indemnify them, to the extent not caused by the Owner's active negligence, sole negligence or willful misconduct, from loss on account thereof but shall not be responsible for such defense or loss when a particular design, process, or product of a particular manufacturer is required by the

Contract Documents. However, if the Contractor has reason to believe the required design, process, or product is an infringement of a patent, the Contractor shall be responsible for such loss unless such information is promptly furnished to the Owner and Architect.

3.15.2 REVIEW

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

3.16 INDEMNIFICATION

3.16.1 SCOPE: CONTRACTOR

To the fullest extent permitted by law, the Contractor shall defend, indemnify, and hold harmless the Owner, any construction manager, Architect, Architect's consultants, the Inspector of Record, the State of California, and their respective agents, employees, officers, volunteers, Boards of Trustees, members of the Boards of Trustees, and directors ("Indemnitees"), from and against claims, actions, damages, liabilities, losses (including but not limited to injury or death of persons, property damage, and compensation owed to other parties), and expenses (including but not limited to attorneys' fees and costs including fees of consultants) alleged by third parties against Indemnitees arising out of or resulting from the following: Contractor's, its Subcontractors', or its suppliers' performance of the Work, including but not limited to the Contractor's or its Subcontractors' use of the Site; the Contractor's or its Subcontractors' construction of the Project, or failure to construct the Project, or any portion thereof; the use, misuse, erection, maintenance, operation, or failure of any machinery or equipment including, but not limited to, scaffolds, derricks, ladders, hoists, and rigging supports, whether or not such machinery or equipment was furnished, rented, or loaned by any of the Indemnitees; or any act, omission, negligence, or willful misconduct of the Contractor or its Subcontractors or their respective agents, employees, material or equipment suppliers, invitees, or licensees but only to the extent caused in whole or in part by the acts or omissions of the Contractor, its Subcontractors, its suppliers, anyone directly or indirectly employed by any of them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity, which would otherwise exist as to a party, person, or entity described in this paragraph. The obligation to defend, indemnify and hold harmless includes any claims or actions by third parties arising out of or resulting from Labor Code section 2810. Contractor shall have no obligation to defend or indemnify the Indemnitees against claims, actions, damages, liabilities, losses, and expenses caused by the active negligence, sole negligence or willful misconduct of Indemnitees. This indemnification shall apply to all liability, as provided for above, regardless of whether any insurance policies are applicable, and insurance policy limits do not act as a limitation upon the amount of the indemnification to be provided by the Contractor.

3.16.2 SCOPE: SUBCONTRACTORS

3.16.2.1 **Indemnity.** The Subcontractors shall defend, indemnify, and hold harmless the Indemnitees from and against claims, actions, damages, liabilities, and losses (including but not limited to injury or death of persons, property damage, and compensation owed to other parties), and expenses (including but not limited to attorneys' fees and costs including fees of consultants) alleged by third parties against Indemnitees arising out of or resulting from the following: Subcontractors' performance of the Work, including but not limited to the Subcontractors' use of the Site; the Subcontractors' construction of the Project or failure to construct the Project or any portion thereof; the use, misuse, erection, maintenance, operation, or failure of any machinery or equipment, including, but not limited to, scaffolds, derricks, ladders, hoists, and rigging supports, whether or not such machinery or equipment was furnished, rented, or loaned by any of the Indemnitees; or any act, omission, negligence, or willful misconduct of the Subcontractors or their respective agents, employees, material or equipment suppliers, invitees, or licensees but only to the extent caused in whole or in part by the acts or omissions of the Subcontractors, anyone directly or indirectly employed by any of them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity, which would otherwise exist as to a party, person, or entity described in this paragraph. This obligation to defend, indemnify and hold harmless includes any claims or actions by third parties arising out of or resulting from Labor Code section 2810. Subcontractors shall have no obligation to defend or indemnify the Indemnitees against claims, actions, damages, liabilities, losses, and expenses caused by the active negligence, sole negligence or willful misconduct of Indemnitees. This indemnification shall apply to all liability, as provided for above, regardless of whether any insurance policies are applicable, and insurance policy limits do not act as a limitation upon the amount of the indemnification to be provided by the Subcontractors.

3.16.2.2 **Joint and Several Liability.** In the event more than one Subcontractor is connected with an accident or occurrence covered by this indemnification, then all such Subcontractors shall be jointly and severally responsible to each of the Indemnitees for indemnification, and the ultimate responsibility among such indemnifying Subcontractors for the loss and expense of any such indemnification shall be resolved without jeopardy to any Indemnitee. The provisions of the indemnity provided for herein shall not be construed to indemnify any Indemnitee for its own negligence if not permitted by law or to eliminate or reduce any other indemnification or right which any Indemnitee has by law or equity.

3.16.3 NO LIMITATION

The Contractor's and the Subcontractor's obligation to indemnify and defend the Indemnitees hereunder shall include, without limitation, any and all claims, damages, and costs: for injury to persons and property (including loss of use), and sickness, disease or death of any person; for breach of any warranty, express or implied; for failure of the Contractor or the Subcontractor to comply with any applicable governmental law, rule, regulation, or other requirement; and for products installed in or used in connection with the Work.

3.17 OWNER AS INTENDED BENEFICIARY

The Owner is an intended beneficiary of any architectural or engineering work secured by, or performed by, the Contractor to fulfill its obligations under the Contract. Contractor shall state in its contracts with architectural or engineering consultants that their work is for the intended benefit of the Owner.

3.18 NOTICE OF EXCUSE FOR NONPERFORMANCE

If Contractor believes that acts or omissions of Owner (including but not limited to Owner caused delay) have prevented Contractor from performing the Work as required by the Contract Documents and Contractor intends to rely on Owner's acts or omissions and Civil Code section 1511(1) as reasons to excuse Contractor's nonperformance or to support, among other things, Contractor's requests for time extensions under section 4.5, below, Contractor shall provide written notice of the excuse within five (5) days of the Owner's acts or omissions. If Contractor fails to timely submit the written notice, Contractor shall have waived any right to later rely on the acts or omissions as a defense to Contractor's nonperformance or as the basis for a time extension, regardless of the merits of the defense or time extension. Contractor will not have satisfied a condition precedent or exhausted administrative remedies. Contractor acknowledges that these written notices are of critical importance to the Owner's management of the Work and Project and the mitigation of costs and delays to the Work and Project.

ARTICLE 4

ADMINISTRATION OF THE CONTRACT

4.1 ARCHITECT

4.1.1 DEFINITION

The Architect is the person lawfully licensed to practice architecture or an entity lawfully practicing architecture identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The term "Architect" means the Architect or the Architect's authorized representative, and shall also refer to all consultants under the Architect's direction and control.

4.1.2 MODIFICATION

To the extent the Contract Documents indicate that Owner has assigned duties or responsibilities to the Architect, Owner reserves the right at all times to reassign such duties or responsibilities to different Owner representatives.

4.1.3 TERMINATION

In the case of the termination of the Architect, the Owner may appoint an architect or another construction professional or may perform such functions with its own licensed professional

personnel. The status of the replacement Architect under the Contract Documents shall be that of the former architect.

4.2 ARCHITECT'S ADMINISTRATION OF THE CONTRACT

4.2.1 STATUS

The Architect will provide administration of the Contract and may be one of several Owner's representatives during construction, through release of all retention, and during the one (1) year period following the commencement of any warranties. The Architect will advise and consult with the Owner. The Architect will have authority to act on behalf of the Owner only to the extent set forth in the Owner/Architect agreement. The Architect will have all responsibilities and power established by law, including California Code of Regulations, Title 24, to the extent set forth in the Owner/Architect agreement.

4.2.2 SITE VISITS

The Architect will visit the Site at intervals necessary in the judgment of the Architect or as otherwise agreed by the Owner and the Architect in writing to become generally familiar with the progress and quality of the completed Work and to determine in general if the Work is being performed in a manner indicating that the Work, when Completed, will be in accordance with the Contract Documents.

4.2.3 LIMITATIONS OF CONSTRUCTION RESPONSIBILITY

The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract Documents, or by tests, inspections, or approvals required or performed by persons other than the Contractor.

4.2.4 COMMUNICATIONS FACILITATING CONTRACT ADMINISTRATION

The Owner and the Contractor shall communicate through the Architect, unless there is a construction manager for the Project or the Owner directs otherwise. Communications between Owner and Subcontractors or material or equipment suppliers shall be through the Contractor.

4.2.5 PAYMENT APPLICATIONS

The Contractor shall submit payment applications to the Architect, unless there is a construction manager for the Project or the Owner directs otherwise.

4.2.6 REJECTION OF WORK

The Architect, Inspector of Record, any construction manager and others may recommend to the Owner that the Owner reject Work which does not conform to the Contract Documents or that the Owner require additional inspection or testing of the Work in accordance with paragraph

13.5.5, whether or not the Work is fabricated, installed, or completed. However, no recommendation shall create a duty or responsibility to the Contractor, Subcontractors, material and equipment suppliers, their agents or employees, or other persons performing portions of the Work.

4.2.7 CHANGE ORDERS

The Architect will prepare change orders and construction change directives and may authorize minor changes in the Work.

4.2.8 WARRANTIES UPON COMPLETION

The Architect in conjunction with the Inspector of Record, or as otherwise directed by Owner, will conduct field reviews of the Work to determine the date of Completion, shall receive and forward to the Owner for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor. The handling by the Architect of such warranties, maintenance manuals, or similar documents shall not diminish or transfer to the Architect any responsibilities or liabilities required by the Contract Documents of the Contractor or other entities, parties, or persons performing or supplying the Work.

Except as may be otherwise directed by Owner, the Architect will conduct a field review of the Contractor's comprehensive list of items to be completed or corrected for development of a punch list and one (1) follow-up field review if required. The cost incurred by the Owner for further field reviews or the preparation of further punch lists by the Architect shall be invoiced to the Contractor and withheld from payment and/or retention.

4.2.9 INTERPRETATION

The Architect, Inspector of Record, any construction manager, the Owner or any independent consultant of Owner, as Owner deems appropriate, will interpret and decide matters concerning performance under and requirements of the Contract Documents on written request of the Contractor. The Owner's response to such requests will be made with reasonable promptness, while allowing sufficient time to permit adequate review and evaluation of the request.

4.2.10 ADDITIONAL INSTRUCTIONS

4.2.10.1 *Architect's Interpretations and Decisions.* Interpretations and decisions of the Architect will be consistent with the intent of and reasonably inferable from the Contract Documents and will be in writing or in the form of drawings. When making such interpretations of and decisions regarding the Contract Documents, the Architect will endeavor to secure faithful performance under the Contract Documents by both the Owner and the Contractor and will not show partiality to either. The Work shall be executed in conformity with, and the Contractor shall do no work without, approved drawings, Architect's clarifying instructions, and/or submittals.

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

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

4.3 **INSPECTOR OF RECORD**

4.3.1 **GENERAL**

One or more Project inspectors ("Inspector of Record") employed by the Owner and approved by the Division of the State Architect will be assigned to the Work in accordance with the requirements of Title 24 of the California Code of Regulations. The Inspector of Record's duties will be as specifically defined in Title 24.

4.3.2 **INSPECTOR OF RECORD'S DUTIES**

All Work shall be under the observation of or with the knowledge of the Inspector of Record. The Inspector of Record shall have free access to any or all parts of the Work at any time. The Contractor shall furnish the Inspector of Record such information as may be necessary to keep the Inspector of Record fully informed regarding progress and manner of work and character of materials. Such observations shall not, in any way, relieve the Contractor from responsibility for full compliance with all terms and conditions of the Contract, or be construed to lessen to any degree the Contractor's responsibility for providing efficient and capable superintendence. The Inspector of Record is not authorized to make changes in the drawings or specifications nor shall the Inspector of Record's approval of the Work and methods relieve the Contractor of responsibility for the correction of subsequently discovered defects, or from its obligation to comply with the Contract Documents.

4.3.3 **INSPECTOR OF RECORD'S AUTHORITY TO REJECT OR STOP WORK**

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

4.3.4 INSPECTOR OF RECORD'S FACILITIES

Within seven (7) days after notice to proceed, the Contractor shall provide the Inspector of Record with temporary facilities, including any requirements stated in Division 1 of the Specifications.

4.4 RESPONSIBILITY FOR ADDITIONAL CHARGES INCURRED BY THE OWNER FOR PROFESSIONAL SERVICES

If at any time prior to the Completion of the requirements under the Contract Documents, through no fault of its own, the Owner is required to provide or secure additional professional services for any reason by any act or omission of the Contractor, the Contractor shall be invoiced by the Owner for any actual costs incurred for any such additional services, which costs may, among other remedies, be withheld from the progress payments and/or retention. Such invoicing shall be independent from any other Owner remedies, including but not limited to liquidated damages. If payments then or thereafter due to the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. Additional services shall include, but shall not be limited to, the following:

- A. Services made necessary by the default of the Contractor.
- B. Services made necessary due to the defects or deficiencies in the Work of the Contractor.
- C. Services required by failure of the Contractor to perform according to any provision of the Contract Documents.
- D. Services in connection with evaluating substitutions of products, materials, equipment, Subcontractors proposed by the Contractor, and making subsequent revisions to drawings, specifications, and providing other documentation required (except for the situation where the specified item is no longer manufactured or available).
- E. Services for evaluating and processing Claims submitted by the Contractor in connection with the Work outside the established Change Order process.
- F. Services required by the failure of the Contractor to prosecute the Work in a timely manner in compliance within the specified time for Completion.
- G. Services in conjunction with the testing, adjusting, balancing and start-up of equipment other than the normal amount customarily associated for the type of Work involved.
- H. Services in conjunction with more than one (1) re-review of required submittals of shop drawings, product data, and samples.

4.5 NOTICES OF POTENTIAL CHANGE, CHANGE ORDER REQUESTS, AND CLAIMS

If the Contractor identifies the potential for extra work, delay in the critical path schedule, or the need for additional money or time, or if the Contractor requests additional money or time, or if the Contractor believes that Owner has failed to pay amounts due or otherwise breached the Contract, or otherwise believes that it is entitled to a modification of the Contract terms and conditions, then Contractor shall follow the procedures in this Section 4.5 and Article 7, otherwise Contractor shall have waived its rights to pursue those issues and any later attempts to recover money or obtain a modification shall be barred. Contractor specifically acknowledges the Owner's and public's interest in, and need to know of, potential changes and disputes as early as possible so Owner can investigate, mitigate and resolve adverse cost and time impacts, if any. It is Contractor's obligation to know and comply with the requirements of Section 4.5 and Article 7, and Owner has no obligation to notify Contractor of any failure to comply with those requirements.

4.5.1 NOTICE OF POTENTIAL CHANGE

Contractor shall submit a written Notice of Potential Change for extra work, critical path delay, or additional money or time. Contractor shall submit written Notices of Potential Change to Owner within five (5) days of Contractor becoming aware of the issues creating the potential for change, unless the issues are, or may soon be, adversely affecting the costs or critical path of the Work, in which case the Contractor must submit the written notice without delay so the Owner may take immediate action to mitigate cost and schedule impacts of the change, if any. The written notice shall explain the nature of the potential change so the Owner may take action to mitigate costs and schedule impacts, if necessary.

When submitting a written Notice of Potential Change based on extra work, Contractor shall not perform the extra work until directed in writing to do so by Owner. When submitting a written Notice of Potential Change for an issue of critical path delay, Contractor shall proactively mitigate the effects of the alleged delay as much as reasonably possible so as to minimize any impact to the schedule, until otherwise directed by Owner. If Contractor intends to rely on Owner's acts or omissions in support of a request for a time extension, then Contractor must also provide the notice set forth in section 3.18, above.

Failure to timely submit a written Notice of Potential Change shall constitute a complete waiver by Contractor of any right to later submit a change order request or pursue a Claim on that issue, or to later pursue any additional money or time extensions in any manner related to that issue, regardless of the merits. Contractor will not have satisfied a condition precedent or exhausted administrative remedies. Contractor acknowledges that these written notices are of critical importance to the Owner's Work and Project management and the mitigation of Work and Project costs and delays.

4.5.2 CHANGE ORDERS REQUESTS

If, after submitting a written Notice of Potential Change pursuant to Section 4.5.1, Contractor continues to believe that it is entitled to additional money or time (including but not limited to grant of a time extension; payment of money or damages arising from work done by, or on behalf of, the Contractor, payment of which is not otherwise expressly provided for or the claimant is not otherwise entitled to; or an amount the payment of which is disputed by the Owner) based on an issue, then Contractor shall submit a Change Order Request (“COR”) to Owner within twenty (20) days of (i) becoming aware of the issues creating a potential change, or (ii) the date by which it should have become aware of the issues creating a potential change. A rejection at any time or a lack of a rejection by Owner of a Notice of Potential Change does not affect the timeline for submitting a COR.

Failure to timely submit a COR related to an issue, or failure to comply with any of the COR requirements in the Contract shall constitute a complete waiver by Contractor of any right to later submit a COR or Claim on that issue, or to later pursue any additional money (including time extensions) in any manner related to that issue, regardless of the merits. Contractor will not have satisfied a condition precedent or exhausted administrative remedies.

The COR shall state the grounds for the additional money or time requested and the amount of money or time requested, and Contractor shall include all information and documentation supporting the COR, including but not limited to calculations and analysis that demonstrate that the requested money or time is allowed by the applicable Contract provisions and law. Contractor will have completely waived its rights to recover any additional time or money other than that time or money specifically requested in the COR. If the COR requests time, then the COR must identify the number of days of time being requested and must include some critical path schedule analysis to support the number of days requested. Contractor may not reserve its rights, whether in a COR or other document, to submit a COR at a later time or in a manner other than as required by the Contract Documents. Any inclusion of a reservation of rights in a COR shall be grounds for rejection of the COR.

In the event that costs or delay are continuing to accrue at the time that a COR is required to be submitted, Contractor must still timely submit the COR with all available information and documentation supporting the COR as described above, and Contractor shall identify the costs or delay that are continuing. For continuing costs, the COR must include an estimate of when the extra work is expected to conclude and the total costs that will be incurred by the time that the extra work is expected to conclude. For continuing delay, the COR must include a schedule and delay analysis of when Contractor estimates that the delay will cease, what the final time extension request is estimated to be, and an estimate of the total delay of damages, if any, that will be requested. When the continuing cost or delay ends, within ten (10) days Contractor shall submit an updated COR that states the final dollar amount and/or time extension requested and that includes all required information and documentation. Failure to submit such final COR shall act as a waiver as described above.

Contractor shall certify each COR that it submits, including the initial COR and final COR for a continuing cost or delay, using the form set forth in Section 4.5.5.1, except that every reference

to “Claim” shall be changed to “COR.” If a COR is submitted without certification, a certification can still be submitted within the timelines set forth in the first paragraph of section 4.5.2. If the COR is not timely certified, Contractor will have completely waived its rights to any money or time for that issue. Contractor will not have satisfied a condition precedent or exhausted administrative remedies. A certification of an initial COR for a continuing cost or delay shall include a statement that “Any estimates in the attached initial COR for a continuing cost or delay are based on true and correct facts and reasonable assumptions, as explained in the initial COR.”

The Owner may accept the entire COR, accept part of the COR and reject the remainder, reject the entire COR, or request additional information. If the Owner does not respond within thirty (30) days of the submission of the COR by accepting the entire COR, accepting part of the COR and rejecting the remainder, or requesting additional information, the entire COR shall be deemed rejected as of the thirtieth (30th) day. In the case of continuing costs or delay, the 30-day timeline will not begin to run until a final COR has been submitted. If the Owner requests additional information within thirty (30) days of submission, then the Contractor shall submit the information within fifteen (15) days of the date of the request and the Owner shall have fifteen (15) days after the receipt of the additional information to accept or reject (in whole or in part) the COR. If the Owner fails to respond within fifteen (15) days after the submission of additional information, the entire COR shall be deemed rejected as of the fifteenth (15th) day.

4.5.3 DEFINITION OF CLAIM

A “Claim” is a separate demand by the Contractor sent by registered or certified mail, return receipt requested, for (a) a time extension, including, without limitation, a request for relief from damages or penalties for delay assessed by Owner under the Contract Documents; (b) payment by Owner of money or damages arising from work done by, or on behalf of, the Contractor pursuant to the Contract Documents, and payment of which is not otherwise expressly provided for or the claimant is not otherwise entitled to; or (c) an amount the payment of which is disputed by the Owner. A Claim includes any claim within the scope of Public Contract Code section 20104 et seq. Resubmittal in any manner of a COR which was previously rejected under Section 4.5.2 constitutes a Claim, whether the COR was rejected in whole or in part, and whether the COR was rejected expressly or deemed rejected by Owner inaction. A Claim includes any dispute Contractor may have with the Owner, including one which does not require a Notice of Potential Change or COR under Sections 4.5.1 and 4.5.2, and includes an alleged breach of contract by the Owner. A Claim under this Article 4.5 shall also constitute a claim for purposes of the California False Claims Act. In the event of a conflict between a Claims provision in Division 1 of the Specifications and Section 4.5, Section 4.5 shall take precedence.

The Notice of Potential Change and COR procedures above are less formal procedures which precede the more formal Claim. A Notice of Potential Change does not constitute a Claim. A COR does not constitute a Claim; **except that** if insufficient time remains before the Claim deadline (see Article 4.5.4) for Contractor to submit a COR and for Owner to process and reject the COR under Article 4.5.2, then either (1) Contractor may submit a COR which Owner shall treat as a Claim, but only if the COR complies with all requirements in this Article 4.5 and

Article 7 for COR's and Claims, or (2) a COR is not required so long as a Claim complying with this Article 4.5 is timely submitted.

A Claim does not include vouchers, invoices, progress payment applications, or other routine or authorized forms of requests for progress payments on the Contract; however, those documents remain "claims" for purposes of the California False Claims Act. A Claim does not include a Government Code Claim. ("Government Code Claim" means a claim under Government Code sections 900 et seq. and 910 et seq.)

4.5.4 TIME FOR SUBMITTING CLAIM; WAIVER

Contractor shall submit a Claim to the Owner's construction manager (or in the absence of a construction manager, to Architect and Owner) within fifteen (15) days of the earliest of the following events: (a) The Completion of the Work; (b) the thirtieth (30th) continuous day without labor by Contractor; or (c) Contractor's submission of a final progress payment application. The deadline for filing a Claim is the "Claim Deadline." Owner's rejection, or lack of rejection, of a COR at any time does not affect the requirement to submit a claim by the Claim Deadline.

In addition, on or before the Claim Deadline, Contractor shall submit to Owner, in writing, a list and a summary of all Claims for money or time extensions under or arising out of this Contract, which were timely filed and fully compliant with the Contract's requirements for Claims, and which the Contractor wishes to pursue in whole or in part. This Claim summary requirement shall not extend the time for submitting a Claim.

Failure to timely submit a Claim, failure to include a Claim in the Claim summary, or failure to comply with any of the Claim requirements in the Contract, including but not limited to this Article 4, will act as a complete waiver of Contractor's rights to (a) recover money or time on the issues for which a Claim was required, (b) submit a Government Code Claim for the money or time (see Section 4.5.6.3), and (c) initiate any action, proceeding or litigation for the money or time, regardless of the merits. Contractor will not have satisfied a condition precedent or exhausted administrative remedies. Owner does not have an obligation to reject the Claim for a failure to comply with any of the Claim requirements in the Contract, including the lack of certification, and any failure by Owner to reject, or any delay in rejecting, a Claim on that basis does not waive the Owner's right to reject the Claim on that basis at a later time. In no event may the Contractor reserve its rights to assert a Claim for a time extension or additional money beyond the timelines set forth in this provision unless the Owner agrees in writing to allow the reservation.

4.5.5 CONTENT OF CLAIM

4.5.5.1 Claim Format; Waiver

Every Claim shall be in writing. All money or time extensions sought must be stated and itemized in the Claim at the time submitted. The responsibility to substantiate Claims shall rest with the Contractor, and the Contractor shall furnish reasonable documentation to support each

Claim, including as applicable, that documentation set forth in sections 4.5.5.2 through 4.5.5.4.

In addition, the Contractor shall include a certification with each and every Claim at the time of submission, as follows:

I, _____ [name of declarant], declare the following:

_____ [Contractor company name] has entered into a Contract with _____ [public entity name] on the _____ [name of project] Project. _____ [Contractor company name] authorized me to prepare the attached Claim for money and/or time extension) for _____ [public entity name] regarding _____ [Contractor company's name] Work on the Contract, and requesting \$_____ and/or _____ additional days), and I prepared the attached Claim. I am the most knowledgeable person at _____ [Contractor company name] regarding this Claim.

The attached Claim complies with all laws applicable to submission of a Claim, including but not limited to California Penal Code section 72, Government Code sections 12650 et seq. (False Claims Act), and Business and Professions Code sections 17200 et seq. (Unfair Business Practices Act). I am aware that submission or certification of false claims, or other claims that violate law or the Contract, may lead to fines, imprisonment, and/or other serious legal consequences for myself or _____ [Contractor company name].

The attached Claim does not breach the Contract between _____ [Contractor company name] and _____ [public entity name] for this Project, is not a false claim, does not violate any applicable law, satisfies all provisions of the Contract applicable to submission of the Claim, only contains truthful and accurate supporting data, and only requests money and/or time extensions that accurately reflect the adjustments to money and time for which I believe that _____ [public entity name] is responsible under its Contract with _____ [Contractor company name].

While preparing this declaration and Claim, I consulted with others (including attorneys, consultants, or others who work for _____ [Contractor company name]) when necessary to ensure that the statements were true and correct.

Contractor understands and agrees that any Claim submitted without this certification does not meet the terms of the Contract Documents; that Owner, or Owner's representatives, may reject the Claim on that basis; and that unless Contractor properly and timely files the Claim with the certification, Contractor cannot further pursue the Claim in any forum and all rights to additional money or time for the issues covered by the Claim are waived due to a condition precedent not having been satisfied.

I declare under the penalty of perjury under the laws of the State of California that the foregoing is true and correct. Executed _____, 20__ at _____, California.

_____ [name of declarant]

Contractor's failure to timely submit a certification will constitute a complete waiver of Contractor's rights to (a) recover money or time on the issues for which a Claim was required, (b) submit a Government Code Claim (see Section 4.5.6.3) for the money or time, and (c) initiate any action, proceeding or litigation for the money or time. Contractor will not have satisfied a condition precedent or exhausted administrative remedies.

4.5.5.2 *Claims for Additional Money*

Each Claim for additional money (including but not limited to those described in (b) and (c) of the first paragraph of Section 4.5.3) must include all facts supporting the Claim, including but not limited to all supporting documentation plus a written analysis as to (a) why the claimed cost was incurred, (b) why Contractor could not mitigate its costs, (c) why the claimed cost is the responsibility of the Owner, and (d) why the claimed cost is a reasonable amount. In no event will the Contractor be allowed to reserve its rights, whether in a Claim or other document, to assert a Claim for money at a later time or in a manner other than as required by the Contract Documents. Any inclusion of a reservation of rights in a Claim shall be grounds for rejection of the Claim. Any costs, direct or indirect, not asserted shall be waived. A Claim may not include any costs incurred in preparation of the Claim or in preparation of any underlying COR, including but not limited to costs of delay analysis.

4.5.5.3 *Claims for Additional Time*

4.5.5.3.1 *Notice of Extent of Claim*

If the Contractor wishes to make a Claim for an increase in the Contract Time (including but not limited to Section 4.5.3(a)), the Claim shall include, but not be limited to, all facts supporting the Claim, all documentation of such facts, all information required by the Contract Documents, and a current schedule and delay analysis explaining (a) the nature of the delay, (b) the Owner's responsibility for the claimed delay, (c) the claimed delay's impact on the critical path, (d) the claimed delay's impact on the date of Completion (including an analysis of any float still remaining and whether the alleged delay in work exceeds such remaining float), and (e) why Contractor could not mitigate the delay impacts.

In no event will the Contractor be allowed to reserve its rights, whether in a Claim or other document, to assert a Claim for a time extension at a later time or in a manner other than as required by the Contract Documents. Any inclusion of a reservation of rights in a Claim shall be grounds for rejection of the Claim. Any time extension not timely asserted in a certified Claim shall be waived.

4.5.5.3.2 *Unusually Severe Weather Claims*

If unusually severe weather is the basis for a Claim for additional time, Contractor must provide Owner data and facts showing that the weather conditions were abnormal for the period of time, could not have been reasonably anticipated or mitigated, and had an adverse effect on the critical path of the scheduled construction.

4.5.5.4 *“Pass Through” Claims*

A Subcontractor or supplier to Contractor may not submit a request for additional time or money directly to the Owner. If a subcontractor or supplier submits a request for additional money or time to Contractor and Contractor wishes to pass it through to Owner, then Contractor must comply with all requirements of Section 4.5, including Notices of Potential Change, Change Order Requests, and Claims, and Public Contract Code section 9204, subdivision (d)(5). Contractor must prepare and submit its own analysis of the Subcontractor’s request, and the Claim must include a copy of the Subcontractor’s request along with any other necessary supporting documentation.

In addition to the other requirements in the Contract Documents, including but not limited to this Section 4.5, the Contractor’s analysis of the Subcontractor’s request must include Contractor’s detailed explanation as to why the Subcontractor or supplier’s request is the Owner’s responsibility, including Contractor’s analysis of (a) why the amount of damages the Subcontractor or supplier requests is justified and appropriate, (b) how Contractor’s breach of the subcontract caused the Subcontractor or supplier to incur these damages, and (c) how the Owner’s breach of the Contract caused the Contractor’s breach of the subcontract. Any Contractor Claim that fails to include the above information, or that states that Owner is responsible for the Subcontractor’s request only in the event that Contractor is found to owe money to Subcontractor, shall act as a complete waiver of Contractor’s rights to (a) recover money or time on the issues for which a Claim was required, (b) submit a Government Code Claim (see Section 4.5.6.3) for the money or time, and (c) initiate any action, proceeding or litigation for the money or time. Contractor will not have satisfied a condition precedent or exhausted administrative remedies.

4.5.6 **PROCEDURES FOR CLAIMS (PUBLIC CONTRACT CODE SECTION 9204)**

Claims are subject to this section 4.5.6, the separate procedures and substantive provisions of Sections 4.5.1 through 4.5.5, all other applicable provisions in the Contract Documents, and Public Contract Code section 9204. In addition, for claims that are \$375,000 or less, the provisions of Public Contract Code section 20104 et. seq. also apply, to the extent they do not conflict with Public Contract Code section 9204.

4.5.6.1 *Claims*

The Owner shall conduct a reasonable review of the Claim and shall respond in writing to any written Claim within 45 days of receipt of the Claim. During that 45 day period, plus any

extension, Owner may request in writing additional documentation supporting the Claim or relating to defenses to the Claim the Owner may have against the Contractor. Owner shall review any additional documentation Contractor supplies in response to that request within the 45 day, plus any extension, timeline.

After receipt of a Claim, the 45-day period may be extended by Owner and Contractor. The written response shall identify which portion of the Claim is disputed and what portion is undisputed. If Owner needs approval from its governing board to provide the written response, and the governing board does not meet within the 45 days or any extended period of time, then the Owner shall have up to three days after the next publicly noticed meeting of the governing board to provide the written response. Any payment due on an undisputed portion of the Claim shall be processed and made within sixty (60) days after the Owner issues the written response. Owner's failure to respond to a Claim within the above time periods or to otherwise meet the above time requirements shall result in the Claim being deemed rejected in its entirety.

4.5.6.2 *Meet and Confer*

If the Contractor disputes the Owner's written response, or the Owner fails to respond within the time prescribed, the Contractor may so notify the Owner, in writing, either within 15 days of receipt of the Owner's response or within 15 days of the Owner's failure to respond within the time prescribed, respectively, and demand an informal conference to meet and confer for settlement of the issues in dispute. Upon a written demand sent by registered or certified mail return receipt requested, the Owner shall schedule a meet and confer conference for settlement of the dispute, which shall take place within 30 days of the demand. Upon written agreement of the Owner and Contractor, the conference may take place during regularly scheduled Project meetings.

If Contractor fails to timely notify the Owner that it wishes to meet and confer pursuant to the previous paragraph, then Contractor will have waived all rights to (a) recover money or time on the issues for which a Claim was required, (b) submit a Government Code Claim (see Section 4.5.6.3) for such money or time, and (c) initiate any action, proceeding or litigation for such money or time. Contractor will not have satisfied a condition precedent or exhausted administrative remedies.

Within ten (10) business days after the conclusion of the meet and confer conference, the Owner shall give a written statement to the Contractor identifying the portion of the Claim that remains in dispute and the portion that is undisputed. Any payment due on an undisputed portion of the Claim shall be processed and made within sixty (60) days after the Owner issues the written statement. Within ten (10) business days of issuance of Owner's written statement, Contractor shall identify in writing the disputed portion of the Claim that shall be submitted to non-binding mediation (which may consist of any nonbinding process, including but not limited to neutral evaluation or a dispute review board), with the Owner and Contractor sharing the costs equally. The Owner and Contractor shall mutually agree to a mediator within ten (10) business days after the Contractor has identified in writing the disputed portion of the Claim. If they cannot agree upon a mediator, then each shall select a mediator and those two mediators shall select a qualified neutral third party to mediate the disputed portion of the Claim. (Each party shall bear

the fees and costs its respective mediator charged in connection with the selection of the neutral mediator). The parties may mutually waive in writing the requirement for mediation. If Contractor fails to timely notify the Owner in writing that it wishes to mediate pursuant to this paragraph, Contractor will have waived all right to further pursue the Claim pursuant to section 4.5.4. The parties shall reasonably cooperate to schedule and attend a mediation as soon as reasonably possible. Owner's failure to respond to the Claim within the above time periods or to otherwise meet the above time requirements shall result in the Claim being deemed rejected in its entirety.

4.5.6.3 *Government Code Claim*

If the Claim or any portion remains in dispute after the mediation and Contractor wishes to pursue it, the Contractor **must** file a timely and proper Government Code Claim. The filing of a Government Code Claim is specifically required in addition to all contractual procedures described in Sections 4.5 through 4.5.6.2. The above contractual procedures do not act as a substitute for the Government Code Claim process, and the two sets of procedures shall be sequential with the contractual procedures coming first.

Failure to timely file a Government Code Claim shall act as complete waiver of Contractor's rights to (a) recover money or time on the issues for which a Government Code Claim was required, and (b) initiate any action, proceeding or litigation for such money or time. Contractor will not have satisfied a condition precedent or exhausted administrative remedies.

Owner and Contractor shall proceed with the Government Code Claim according to Government Code, Section 900 et seq., and as otherwise permitted by law. For purposes of the applicable Government Code provisions, and as provided in Public Contract Code section 20104.2(e), the running of the time period within which a Contractor must file a Government Code Claim shall be tolled from the time the Contractor submits a written Claim under Article 4.5 until the time that the Claim is denied, in whole or in part, as a result of the meet and confer process in Section 4.5.6.2, including any period of time utilized by the meet and confer process.

4.5.7 CONTINUING CONTRACT PERFORMANCE

Despite submission or rejection of a Notice of Potential Change, COR or Claim, the Contractor shall proceed diligently with performance of the Contract as directed by Owner, and the Owner shall continue to make any undisputed payments in accordance with the Contract.

4.5.8 CLAIMS FOR CONCEALED OR UNKNOWN CONDITIONS

4.5.8.1 *Trenches or Excavations Less Than Four Feet Below the Surface*

If Contractor encounters conditions at the Site which are subsurface or otherwise concealed physical conditions, which differ materially from those indicated in the Contract Documents, or unknown physical conditions of an unusual nature, which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall give notice to the Owner promptly

before conditions are disturbed and in no event later than ten (10) days after first observance of the conditions. If Contractor believes that such conditions differ materially and will cause an increase in the Contractor's cost of, time required for, or performance of any part of the Work, Contractor must comply with the provisions above for Notice of Potential Change, Change Order Request, and Claims (beginning with Section 4.5.1).

4.5.8.2 *Trenches or Excavations Greater Than Four Feet Below the Surface*

Pursuant to Public Contract Code section 7104, when any excavation or trenching extends greater than four feet below the surface:

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

(1) Material that the Contractor believes may be material that is hazardous waste, as defined in Section 25117 of the Health and Safety Code, that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with the provisions of existing law.

(2) Subsurface or latent physical conditions at the site differing from those indicated by information about the site made available to bidders prior to the deadline for submitting bids.

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

4.5.8.2.2 The public entity shall promptly investigate the conditions, and if it finds that the conditions do materially so differ, or do involve hazardous waste, and cause a decrease or increase in the Contractor's cost of, or the time required for, performance of any part of the Work shall issue a change order under the procedures described in the Contract.

4.5.8.2.3 In the event that a dispute arises between the public entity and the Contractor whether the conditions materially differ, or involve hazardous waste, or cause a decrease or increase in the Contractor's cost of, or time required for, performance of any part of the Work, the Contractor shall not be excused from the Contract Completion deadline, but shall proceed with all Work to be performed under the Contract. The Contractor shall retain any and all rights provided either by Contract or by law which pertain to the resolution of disputes and protests between the contracting parties.

4.5.9 INJURY OR DAMAGE TO PERSON OR PROPERTY

If either party to the Contract suffers injury or damage to person or property because of an act or omission of the other party, any of the other party's employees or agents, or others for whose

acts such party is legally liable, written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding ten (10) days after first observance. The notice shall provide sufficient detail to enable the other party to investigate the matter. For a Notice of Potential Change, COR and Claim for additional cost or time related to this injury or damage, Contractor shall follow Section 4.5.

ARTICLE 5

SUBCONTRACTORS

5.1 DEFINITIONS

5.1.1 SUBCONTRACTOR

A Subcontractor is a person or entity, who has a contract with the Contractor to perform a portion of the Work at the Site. The term “Subcontractor” is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term “Subcontractor” does not include a separate contractor or subcontractors of a separate contractor. To the extent that the term Trade Contractor is utilized in the Contract Documents, it shall have the same meaning as the term “Subcontractor.”

5.1.2 SUB-SUBCONTRACTOR

A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the Site. The term “Sub-subcontractor” is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

5.1.3 SPECIALTY CONTRACTORS

If a Subcontractor is designated as a “Specialty Contractor” as defined in section 7058 of the Business and Professions Code, all of the Work outside of that Subcontractor’s specialty shall be performed in compliance with the Subletting and Subcontracting Fair Practices Act, Public Contract Code sections 4100, et seq.

5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

5.2.1 ASSIGNMENT OR SUBSTITUTION - CONSENT OF OWNER

In accordance with Public Contract Code sections 4107 and 4107.5, no Contractor whose bid is accepted shall, without the written consent of the Owner: substitute any person or entity as a Subcontractor in place of the Subcontractor designated in the original bid; permit any such Subcontract to be assigned or transferred, or allow it to be performed by any person or entity other than the original Subcontractor listed in the original bid; sublet or subcontract any portion of the Work in excess of one-half of one percent (0.5%) of the Contractor’s total bid as to which

its original bid did not designate a Subcontractor. Any assignment or substitution made without the prior written consent of the awarding authority shall be void, and the assignees shall acquire no rights in the Contract. Any consent, if given, shall not relieve Contractor or its Subcontractors from their obligations under the terms of the Contract Documents.

5.2.2 GROUNDS FOR SUBSTITUTION

Pursuant to Public Contract Code section 4107 and the procedure set forth therein, no Contractor whose bid is accepted may request to substitute any person or entity as a Subcontractor in place of a Subcontractor listed in the original bid except in the following instances:

- A. When the Subcontractor listed in the bid after having a reasonable opportunity to do so, fails or refuses to execute a written contract for the scope of work specified in the subcontractor's bid and at the price specified in the subcontractor's bid, when that written contract, based upon the general terms, conditions, plans and specifications for the Project involved or the terms of that Subcontractor's written bid, is presented to the Subcontractor by the Contractor;
- B. When the listed Subcontractor becomes insolvent or the subject of an order for relief in bankruptcy;
- C. When the listed Subcontractor fails or refuses to perform his or her Subcontract;
- D. When the listed Subcontractor fails or refuses to meet the bond requirements of the prime contractor set forth in Public Contract Code section 4108.
- E. When the Contractor demonstrates to the awarding authority, or its duly authorized officer, subject to the further provisions of Public Contract Code section 4107.5, that the name of the Subcontractor was listed as the result of inadvertent clerical error;
- F. When the listed Subcontractor is not licensed pursuant to the Contractors License Law; or
- G. When the awarding authority, or its duly authorized officer, determines that the Work being performed by the listed Subcontractor is substantially unsatisfactory and not in substantial accordance with the plans and specifications, or the Subcontractor is substantially delaying or disrupting the progress of the Work.
- H. When the listed Subcontractor is ineligible to work on a public works project pursuant to Section 1777.1 of the Labor Code.
- I. When the awarding authority determines that a listed Subcontractor is not a responsible contractor.

5.2.2.1 **No Change in Contract.** Any substitutions of Subcontractors shall not result in any increase in the Contract Sum or result in the granting of any extension of time for Completion of the Work.

5.2.2.2 **Substitution Due to Clerical Error.** The Contractor, as a condition of asserting a claim of inadvertent clerical error in the listing of a Subcontractor, shall, pursuant to Public Contract Code section 4107.5, within two (2) working days after the time of the prime bid opening by the awarding authority, give written notice to the awarding authority and copies of such notice to both the Subcontractor it claims to have listed in error, and the intended Subcontractor who had bid to the Contractor prior to bid opening. Any listed Subcontractor who has been notified by the Contractor in accordance with the provisions of this section as to an inadvertent clerical error, shall be allowed six (6) working days from the time of the prime bid opening within which to submit to the awarding authority and to the Contractor written objection to the Contractor's claim of inadvertent clerical error.

In all other cases, the Contractor must make a request in writing to the awarding authority for the substitution of a subcontractor, giving reasons therefor. The awarding authority shall mail a written notice to the listed Subcontractor giving reasons for the proposed substitution. The listed Subcontractor shall have five (5) working days from the date of such notice within which to file with the awarding authority written objections to the substitution.

Failure to file written objections pursuant to the provisions of this section within the times specified herein shall constitute a complete waiver of objection to the substitution by the listed Subcontractor and, where the ground for substitution is an inadvertent clerical error, an agreement by the listed Subcontractor that an inadvertent clerical error was made.

If written objections are filed, the awarding authority shall give five (5) days notice to the Contractor and to the listed Subcontractor of a hearing by the awarding authority on the Contractor's request for substitution as provided in Public Contract Code section 4107. The determination by the awarding authority shall be final.

5.3 SUBCONTRACTUAL RELATIONS

By appropriate agreement, written where legally required for validity, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all obligations and responsibilities, which the Contractor, by the Contract Documents, assumes toward the Owner. Each subcontract agreement shall preserve and protect the rights of the Owner under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound. Upon

written request of the Subcontractor, the Contractor shall identify to the Subcontractor the terms and conditions of the proposed subcontract agreement, which may be at variance with the Contract Documents. Subcontractors shall similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS

Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner provided that:

- A. Assignment is effective only after termination of the Contract with the Contractor by the Owner for cause pursuant to Article 14 and only for those subcontract agreements which the Owner accepts by notifying the Subcontractor in writing; and
- B. Assignment is subject to the prior rights of the surety, if any, obligated under any bond relating to the Contract.

5.5 SUBCONTRACTOR'S RESPONSIBILITIES

Every Subcontractor is bound to the following provisions, unless specifically noted to the contrary in the Subcontractor's contract subject to the limitations of section 5.3.

5.5.1 SUPERVISION BY SUBCONTRACTORS

Subcontractors shall efficiently supervise their Work, using their best skill and attention. Each of them shall carefully study and compare all Drawings, Specifications, and other instructions, shall at once report to Contractor any error or omission which any of them may discover, and shall subsequently proceed with the Work in accordance with instructions from the Contractor concerning such error or omission. Each Subcontractor shall be fully responsible for and shall bear the full risk of loss of all of its property.

5.5.2 DISCIPLINE AND ORDER

Each Subcontractor shall at all times enforce strict discipline and good order among its Subcontractors, material or equipment suppliers, or their agents, employees, and invitees, and shall establish and maintain surveillance over the activities of each of the foregoing to minimize any disturbance, damage, pollution, or unsightly conditions relative to property areas adjacent to or in the vicinity of the Site. The Contractor shall have the right to remove from the Work any employee of a Subcontractor for any reason including, without limitation, incompetence or carelessness.

5.5.3 DEFECTS DISCOVERED

Should the proper and accurate performance of the Work depend upon the proper and accurate performance of other work not included in its Contract, each Subcontractor shall use all

necessary means to discover any defect in such other work and shall allow the Contractor, the Owner and Architect, or other Subcontractors as Contractor elects, a reasonable amount of time to remedy such defects. If the Subcontractor should proceed with its Work, it shall be considered to have accepted such other work, unless the Subcontractor shall have proceeded pursuant to instructions in writing by the Contractor over its written objection.

5.5.4 SUBCONTRACTOR INFORMATION

Each Subcontractor shall submit to the Owner, the Contractor, or the Architect, as the case may be, promptly when requested by any of the foregoing, information with respect to the names, responsibilities, and titles of the principal members of its staff, the adequacy of the Subcontractor's equipment and the availability of necessary materials and supplies. Subcontractor shall fully cooperate with Contractor in its periodic review of the adequacy of Subcontractor's supervision, personnel, and equipment, and the availability of necessary materials and supplies and shall promptly comply with the requirements of the Contractor with respect thereto.

5.5.5 TEMPORARY STRUCTURES

Each Subcontractor shall furnish at its expense its own temporary facilities and storage except those specifically agreed to be furnished to it by the Contractor in the Subcontract Agreement. Subcontractor's material storage rooms and field offices, etc., will be placed in locations designated by the Contractor. When it becomes necessary due to the progress of the Work for the Subcontractor to relocate its field operations, it will do so in an expeditious manner and at no additional cost to Contractor or Owner. The construction of material storage rooms and field offices, etc., will be of fire resistive material only, such as concrete or gypsum block, rated drywall, or sheet metal.

5.5.6 CHARGES TO SUBCONTRACTOR

Each Subcontractor may be subject to the Contractor's reasonable charges for hoisting, repair to other work caused by the fault or negligence of Subcontractor, removal of Subcontractor's rubbish, and clean-up occasioned by Subcontractor.

5.5.7 FINES IMPOSED

Subcontractor shall comply with and pay any fines or penalties imposed for violation of any applicable law, ordinance, rule, regulation, Environmental Impact Report mitigation requirement, and lawful order of any public authority, including, without limitation, all OSHA and California OSHA requirements and those of other authorities having jurisdiction of the safety of persons or property.

5.5.8 PROJECT SIGNS

Each Subcontractor shall not display on or about the Project any sign, trademark, or other advertisement. The Owner will permit a single Project sign, which shall be subject to the

Owner's prior and sole discretion and approval, as to all matters including, without limitation, size, location, material, colors, style and size of printing, logos and trademarks (if any), text, and selection of names to be displayed.

5.5.9 REMEDIES FOR FAILURE TO PERFORM

Without limitation of any other right or remedy available to Contractor under the Contract Documents or at law, should: the Subcontractor fail to perform its portion of the Work in a skilled and expeditious manner in accordance with the terms of the Contract Documents with sufficient labor, materials, equipment, and facilities; delays the progress of the job or otherwise fail in any of its obligations; or either a receiver is appointed for the Subcontractor or the Subcontractor is declared to be bankrupt or insolvent, and such appointment, bankruptcy, or insolvency proceedings or declaration is not set aside within thirty (30) days, then the Contractor, upon three (3) days notice to the Subcontractor (subject to the requirements of Pub. Contracts Code, § 4107), may provide such labor, materials, or perform such work and recover the cost plus profit and overhead from monies due or to become due thereafter to the Subcontractor. The Contractor may terminate the employment of the Subcontractor, taking possession of its tools, materials, and equipment related to the Work and cause the entire portion of the Subcontractor's Work to be finished either by another Subcontractor or through the Contractor's own forces.

5.5.10 DISPUTES NOT TO AFFECT WORK

In the event of any dispute as to whether or not any portion of the Work is within the scope of the Work to be performed by a Subcontractor, or any dispute as to whether or not the Subcontractor is entitled to a Change Order for any Work requested of it or entitled to payment, the Subcontractor shall continue to proceed diligently with the performance of the Work. Regardless of the size or nature of the dispute, the Subcontractor shall not under any circumstances cease or delay performance of its portion of the Work during the existence of the dispute. The Contractor shall continue to pay the undisputed amounts called for under the Subcontract Agreement during the existence of the dispute. Any party stopping or delaying the progress of the Work because of a dispute shall be responsible in damages to the Owner, the Architect, and the Contractor for any losses suffered as a result of the delay.

5.5.11 APPLICATION FOR PAYMENT

Contractor agrees to advise the Subcontractor if any documentation in connection with the Subcontractor's application for payment has not been accepted or is in any way unsatisfactory.

5.5.12 COMPLIANCE WITH PROCEDURES

Each Subcontractor shall comply with all procedures established by the Contractor for coordination among the Owner, the Owner's consultants, Architect, Contractor, and the various Subcontractors for coordination of the Work with all local municipal authorities, government agencies, utility companies, and any other agencies with jurisdiction over all or any portion of the Work. The Subcontractor shall cooperate fully with all of the foregoing parties and authorities.

5.5.13 ON-SITE RECORD KEEPING

Subcontractor shall comply with all on-Site record keeping systems established by the Contractor and shall, upon the request of the Contractor, provide the Contractor with such information and reports as the Contractor may deem appropriate. Without limitation of the foregoing, the Subcontractor shall assemble all required permits and certificates so that they are readily accessible at the Site.

5.5.14 NON-EXCLUSIVE OBLIGATIONS

The specific requirements of Article 5 are not intended to exclude the obligation of the Subcontractor to comply with any of the other provisions of the General Conditions and the other Contract Documents which are relevant to the proper performance of its portion of the Work.

ARTICLE 6

CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

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

6.1.1 OWNER'S RIGHTS

The Owner reserves the right to perform Project work with the Owner's own forces, or to award separate contracts in connection with such other work or other construction or operations on the Site under contract conditions identical or substantially similar to these including those portions related to insurance. Upon the election to perform such work with its own forces or by separate contracts, the Owner shall notify the Contractor. If the Contractor claims that delay or additional cost is involved because of such action by the Owner, the Contractor shall proceed pursuant to Section 4.5 in the Contract Documents.

6.1.2 DESIGNATION AS CONTRACTOR

When separate contracts are awarded for different portions of the Project or other construction or operations on the Site, the term "Contractor" in the Contract Documents in each of those contracts shall mean the contractor who executes each separate Owner/Contractor agreement.

6.1.3 CONTRACTOR DUTIES

The Contractor shall have overall responsibility for coordination and scheduling of the activities of the Owner's own forces and of each separate contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with other separate contractors and the Owner in reviewing their construction schedules when directed to do so. The Contractor shall make any revisions to the construction schedule and Contract Sum deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, separate contractors, and the Owner until subsequently revised. If Contractor fails to fulfill these obligations, Owner may exercise its rights under section 2.4. The right of Owner to carry out the Work under section 2.4 shall not give rise to a duty on the part of Owner to exercise this right for the benefit of Contractor or any other person or entity, except to the extent required by section 6.1.4.

6.1.4 OWNER OBLIGATIONS

Unless otherwise provided in the Contract Documents, when the Owner performs work related to the Project with the Owner's own forces, the Owner shall be deemed to be subject to the same obligations, and to have the same rights, which apply to the Contractor under the General Conditions, including, without excluding others, those stated in Article 3, this Article 6 and Articles 10 and 12.

6.2 MUTUAL RESPONSIBILITY

6.2.1 DELIVERY AND STORAGE

The Contractor shall afford the Owner and separate contractors reasonable opportunity for delivery and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the separate contractors' construction and operations with theirs as required by the Contract Documents.

6.2.2 NOTICE BY CONTRACTOR

If part of the Contractor's Work depends upon proper execution or results from work by the Owner or a separate contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Owner patent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor to so report shall constitute an acknowledgment that the Owner's or separate contractors' completed or partially completed construction is fit and proper to receive the Contractor's Work, except as to defects not then reasonably discoverable.

6.2.3 COSTS INCURRED

Costs, expenses, and damages caused by delays, improperly timed activities, defective construction, or damages to another's work/Work or property shall be borne by the party responsible. Should Contractor cause damage to the work or property of any other contractor on

the Project, or to the Project or property of a third party, or cause any delay to any such contractor or third party, the Contractor shall defend, indemnify and hold Owner harmless for such damage or delay under Section 3.16, above. Owner may withhold from progress payments and/or retention the cost of delay or damage to another contractor's work or damage to another contractor's property or to the property of Owner caused by Contractor.

6.2.4 CORRECTION OF DAMAGE

The Contractor shall promptly remedy damage wrongfully caused by the Contractor to completed or partially completed construction or to property of the Owner or separate contractors.

6.3 OWNER'S RIGHT TO CLEAN UP

If a dispute arises among the Contractor, separate contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish as described in Section 3.13, the Owner may clean up and allocate the cost among those responsible as the Owner determines to be just.

ARTICLE 7

CHANGES IN THE WORK

7.1 CHANGES

7.1.1 NO CHANGES WITHOUT AUTHORIZATION

The Owner reserves the right to change the Work by making such alterations, deviations, additions to, or deletions from the plans and specifications, as may be deemed by the Owner to be necessary or advisable for the proper Completion or construction of the Work contemplated, and Owner reserves the right to require Contractor to perform such work. No adjustment will be made in the Contract unit price of any Contract item regardless of the quantity ultimately required.

Owner shall compensate Contractor with money or grant extra time for any extra work ordered by the Owner to be performed. Contractor shall follow the provisions of 7.6 and 7.7 when requesting additional money or additional time. Contractor shall expeditiously perform all extra work upon direction, even if no agreement has been reached on extra time or money. For all such changes resulting in a credit to Owner, Contractor shall follow 7.5 and 7.7 in providing the credit to Owner. Contractor shall bring all potential credits to the Owner's attention.

There shall be no change whatsoever in the drawings, specifications, or in the Work or payments under the Contract Documents without an executed Change Order, Construction Change Directive, or order by the Owner pursuant to Section 7.1.2. 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 properly requested under Section

4.5 and authorized by, and the cost thereof approved in writing by, Change Order or Construction Change Directive. No extension of time for performance of the Work shall be allowed hereunder unless request for such extension is properly made under Section 4.5 and such time is thereof approved in writing by Change Order or Construction Change Directive. 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.

7.1.2 AUTHORITY TO ORDER MINOR CHANGES

The Owner has 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. Such changes shall be effected by written Construction Change Directive and shall be binding on the Contractor. The Contractor shall carry out such written orders promptly.

7.2 CHANGE ORDERS (“CO”)

A CO is a written instrument signed by the Owner and the Contractor, stamped (or sealed) and signed by Architect, and approved by the Owner’s Governing Board and DSA, stating the agreement of Owner and Contractor upon all of the following:

- A. A change in the Work;
- B. The amount of the adjustment in the Contract Sum, if any; and
- C. The extent of the adjustment in the Contract Time, if any.

Unless expressly stated otherwise in the CO, any CO executed by Owner and Contractor constitutes and includes full and complete money and time (including but not limited to, adjustments to money and time) for all costs and effects caused by any of the changes described within it. Unless expressly stated otherwise in the CO, in consideration for the money received for the changes described in the CO, Contractor waives all Claims for all costs and effects caused by any of the changes, including but not limited to labor, equipment, materials, delay, extra work, overhead (home and field), profit, direct costs, indirect costs, acceleration, disruption, impaired productivity, time extensions, and any the costs and effects on Subcontractors and suppliers of any tier.

7.3 CONSTRUCTION CHANGE DIRECTIVES (“CCD”)

7.3.1 DEFINITION

A CCD is a written unilateral order signed by the Owner, and if necessary by the Architect, directing a change in the Work and stating an adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by CCD, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions pursuant to Section 7.1.1.

7.3.2 USE TO DIRECT CHANGE

A CCD shall be used in the absence of agreement on the terms of a CO. If Contractor disagrees with the terms of a CCD, it shall nevertheless perform the work directed by the CCD, but it may pursue the Notice of Potential Change, COR and Claim procedures of Section 4.5 if Contractor believes it is entitled to changes in the Contract Sum or Contract Time.

7.4 REQUEST FOR INFORMATION (“RFI”)

7.4.1 DEFINITION

An RFI is a written request prepared by the Contractor asking the Owner 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 problems which have arisen under field conditions.

7.4.2 SCOPE

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

7.4.3 RESPONSE TIME

Unless Owner expressly directs otherwise in writing, Contractor shall submit RFIs directly to the Architect, with copies forwarded to the Owner. Contractor shall submit a revised and updated priority schedule with each RFI. The Architect shall endeavor to follow the Contractor’s requested order of priorities. The Owner and Contractor agree that an adequate time period for the Architect (or other designated recipient of the RFI) to respond to an RFI is generally fourteen (14) calendar days after the Architect’s receipt of an RFI, unless the Owner and Contractor agree otherwise in writing. However, in all cases, the Architect shall take such time, whether more or less than 14 days, as is necessary in the Architect’s professional judgment to permit adequate review and evaluation of the RFI. If Contractor informs the Architect that it needs a response to an RFI expedited to avoid delay to the critical path, the Architect shall provide a response as quickly as reasonably possible. The total time required for the Architect to respond is subject to

the complexity of the RFI, the number of RFI's submitted concurrently and the reprioritization of pending RFI's submitted by the Contractor, among other things. If Contractor believes that the Architect's response results in a change in the Work that warrants additional money or time, or that Architect's response was unreasonably delayed and caused delay to the Work's critical path, Contractor shall follow the procedures for additional money or time under Section 4.5. No presumption shall arise as to the timeliness of the response if the response is more than fourteen (14) days after the Architect's receipt of the RFI. Contractor shall review the Contract Documents before submitting an RFI to ensure that the information is not already in the Contract Documents. To compensate the Owner for time and costs incurred for each time the information was already in the Contract Documents, Owner may withhold \$100 from progress payments or retention in addition to any other remedies which Owner may have the right to pursue.

7.4.4 COSTS INCURRED

The Contractor shall be invoiced by the Owner for any costs incurred for professional services, which shall be withheld from progress payments or retention, if an RFI requests an interpretation or decision of a matter where the information sought is equally available to the party making such request.

7.5 REQUEST FOR PROPOSAL ("RFP")

7.5.1 DEFINITION

An RFP is Owner's written request asking the Contractor to submit to the Owner an estimate of the effect, including credits, of a proposed change on the Contract Sum and the Contract Time.

7.5.2 SCOPE

An RFP shall contain adequate information, including any necessary drawings and specifications, to enable Contractor to provide the cost breakdowns required by section 7.7. The Contractor shall not be entitled to any additional money for preparing a response to an RFP, whether ultimately accepted or not.

7.6 CHANGE ORDER REQUEST ("COR")

7.6.1 DEFINITION

A COR is a written request prepared by the Contractor asking the Owner for additional money or time.

7.6.2 CHANGES IN PRICE

A COR shall include breakdowns per section 7.7 to validate any proposed change in Contract Sum.

7.6.3 CHANGES IN TIME

Where a change in Contract Time is requested, a COR shall also include delay analysis to validate any proposed change to the Contract Time, and shall meet all requirements in these General Conditions, including but not limited to Section 8.4. 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 Work schedule as defined in section 3.9 and Division 1 of the Specifications.

7.7 PRICE OF CHANGE ORDERS

7.7.1 SCOPE

Any COR shall provide in writing to the Owner, the Architect and any construction manager, the effect of the proposed CO upon the Contract Sum and the actual cost of construction, which shall include a complete itemized cost breakdown of all labor and material showing actual quantities, hours, unit prices, wage rates, required for the change, and the effect upon the Contract Time of such CO.

7.7.2 DETERMINATION OF COST

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

- A. Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- B. Unit prices stated in the Contractor's original bid, the Contract Documents, or subsequently agreed upon between the Owner and the Contractor;
- C. Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- D. By cost of material and labor and percentage of overhead and profit. If the value is determined by this method the following requirements shall apply:

1. **Daily Reports by Contractor.**

a) General: At the close of each working day, the Contractor shall submit a daily report to the Inspector of Record and any construction manager, 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 of Record 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.

2. **Basis for Establishing Costs.**

a) 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. The use of a labor classification, which would increase the extra work cost, will not be permitted unless the Contractor establishes the necessity for such additional costs. Labor costs for equipment operators and helpers shall be reported only when such costs are not included in the invoice for equipment rental.

b) Materials shall be at invoice or lowest current price at which such materials are locally available and delivered to the Site in the quantities involved, plus sales tax, freight, and delivery.

The 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.

c) Tool and Equipment Rental. No payment will be made for the use of tools which have a replacement value of \$100 or less.

Regardless of ownership, the rates to be used in determining equipment rental costs shall not exceed listed rates prevailing locally at equipment rental agencies or distributors at the time the work is performed.

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

Necessary loading and transportation costs for equipment used on

the extra work shall be included. If equipment is used intermittently and, 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.

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

d) 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 Application for Payment.

e) Invoices. Vendors' invoices for material, equipment rental, and other expenditures shall be submitted with the COR. If the Application 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.

f) Overhead, premiums and profit. For overhead, including direct and indirect costs, submit with the COR and include: home office overhead, off-Site supervision, CO preparation/negotiation/research for Owner initiated changes, time delays, project interference and disruption, additional guaranty and warranty durations, on-Site supervision, additional temporary protection, additional temporary utilities, additional material handling costs, and additional safety equipment costs.

7.7.3 FORMAT FOR PROPOSED COST CHANGE

The following format shall be used as applicable by the Owner and the Contractor to communicate proposed additions and deductions to the Contract.

	<u>EXTRA</u>	<u>CREDIT</u>
A. Material (attach itemized quantity and unit cost plus sales tax, invoices, receipts, truck tags, etc., for force account work)	_____	_____
B. Labor (attach itemized hours and rates, daily logs, certified payroll, etc.)	_____	_____

C.	Equipment (attach any invoices)	_____	_____
D.	Subtotal	_____	_____
E.	If Subcontractor performed Work, add Subcontractor's overhead and profit to portions performed by Subcontractor, not to exceed fifteen percent (15%) of item D.	_____	_____
F.	Liability and Property Damage Insurance, Worker's Compensation Insurance, Social Security, and Unemployment Taxes, not to exceed twenty-five percent (25%) of Item B.	_____	_____
G.	Subtotal	_____	_____
H.	General Contractor's Overhead and Profit, not to exceed fifteen percent (15%) of Item G; and for work performed by subcontractors, not to exceed five percent (5%).	_____	_____
I.	Subtotal	_____	_____
J.	Bond not to exceed one percent (1%) of Item I.	_____	_____
K.	TOTAL	_____	_____

It is expressly understood that the value of such extra work or changes, as determined by any of the aforementioned methods, expressly includes (1) 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, and (2) any costs of preparing a COR, including but not limited to delay analysis. Any costs or expenses not included are deemed waived.

7.7.4 DISCOUNTS, REBATES, AND REFUNDS

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

7.7.5 ACCOUNTING RECORDS

With respect to portions of the Work performed by COs and CCDs on a time-and-materials, unit-cost, or similar basis, the Contractor shall keep and maintain cost-accounting records satisfactory to the Owner, which shall be available to the Owner on the same terms as any other books and records the Contractor is required to maintain under the Contract Documents.

7.7.6 NOTICE REQUIRED

Contractor shall submit a written Notice of Potential Change for additional money or time pursuant to section 4.5.1.

7.7.7 APPLICABILITY TO SUBCONTRACTORS

Any requirements under this Article 7 shall be equally applicable to COs or CCDs issued to Subcontractors by the Contractor to the same extent required of the Contractor.

7.8 WAIVER OF RIGHT TO CLAIM MONEY OR TIME

Failure to demand money based on costs, or time extensions, as part of a COR constitutes a complete waiver of Contractor's right to claim the omitted money or time. All money or time for an issue must be included in the COR at the time submitted.

ARTICLE 8

TIME

8.1 DEFINITIONS

8.1.1 CONTRACT TIME

Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Completion of the Work.

8.1.2 NOTICE TO PROCEED

Contractor shall not commence the Work until it receives a Notice to Proceed from Owner. The date of commencement of the Work is the date established in the Notice to Proceed. The date of commencement shall not be postponed by the failure to act of the Contractor or of persons or entities for whom the Contractor is responsible.

8.1.3 DAYS

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

8.2 HOURS OF WORK

8.2.1 SUFFICIENT FORCES

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

8.2.2 PERFORMANCE DURING WORKING HOURS

Work shall be performed during regular working hours except that in the event of an emergency or when required to complete the Work in accordance with job progress, work may be performed outside of regular working hours with the advance written consent of the Owner.

8.2.3 LABOR CODE APPLICATION

As provided in Article 3 (commencing at § 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 provision hereinabove set forth, work performed by employees of Contractors in excess of eight (8) hours per day and forty (40) hours during any one week shall be permitted upon this public work with compensation provided for all hours worked in excess of eight (8) hours per day at not less than one and one-half (1-1/2) times the basic rate of pay.

Contractor or subcontractor shall pay to the Owner a penalty of Twenty-five Dollars (\$25.00) for each worker employed in the execution of this Contract by the Contractor, or by any Subcontractor, for each calendar day during which such worker is required or permitted to work more than eight (8) hours in any calendar day and forty (40) hours in any one (1) calendar week, in violation of the provisions of Article 3 (commencing at § 1810), Chapter 1, Part 7, Division 2 of the Labor Code, unless compensation for the workers so employed by Contractor is not less than one and one-half (1-1/2) times the basic rate of pay for all hours worked in excess of eight (8) hours per day.

8.2.4 COSTS FOR AFTER HOURS INSPECTIONS

If the work done after hours is required by the Contract Documents to be done outside the Contractor's or the Inspector of Record's regular working hours, the costs of any inspections, if required to be done outside normal working hours, shall be borne by the Owner.

If the Owner allows the Contractor to do work outside regular working hours for the Contractor's own convenience, the costs of any inspections required outside regular working hours, among other remedies, shall be invoiced to the Contractor by the Owner and withheld from progress payments and/or retention. Contractor shall give Owner at least 48 hours notice prior to working outside regular working hours.

If the Contractor elects to perform work outside the Inspector of Record's regular working hours, costs of any inspections required outside regular working hours, among other remedies, may be invoiced to the Contractor by the Owner and withheld from progress payments and/or retention.

8.2.5 TIME FOR COMMENCEMENT BY SUBCONTRACTORS

Unless otherwise provided in the Contract Documents, all Subcontractors shall commence their Work within two (2) consecutive business days after notice to them by the Contractor and shall prosecute their Work in accordance with the progress of the Work.

8.3 PROGRESS AND COMPLETION

8.3.1 TIME OF THE ESSENCE

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

8.3.2 NO COMMENCEMENT WITHOUT INSURANCE

The Contractor shall not knowingly, except by agreement or instruction of the Owner, in writing, commence operations on the Site or elsewhere prior to the effective date of insurance required by Article 11 to be furnished by the Contractor. The date of commencement of the Work shall not be changed by the effective date of such insurance.

8.3.3 EXPEDITIOUS COMPLETION

The Contractor shall proceed expeditiously to perform the Work, with adequate forces, labor, materials, equipment, services and management, and shall achieve Completion within the Contract Time.

8.4 EXTENSIONS OF TIME - LIQUIDATED DAMAGES

8.4.1 CONDITIONS ALLOWING FOR EXTENSIONS OF TIME TO COMPLETE THE WORK, ONLY (EXCUSABLE DELAY)

If Contractor exercises due diligence, but the critical path schedule of the Work is unavoidably delayed due to acts of God, acts of public enemy, acts of the Government, acts of the Owner or anyone employed by it, acts of another contractor in performance of a contract (other than this Contract) with the Owner, fires, floods, epidemics, quarantine restrictions, labor disputes, unusually severe weather, or delays of subcontractors due to such causes, the Owner shall extend the Contract Time if Contractor complies with Section 4.5 and Article 7. Owner shall take into consideration other relevant factors such as concurrent delays. Contractor has the burden of proving that any delay was excusable.

8.4.2 COMPENSABLE DELAY (TIME AND MONEY)

Compensable delays are those excusable delays for which Contractor is also entitled to money. To be compensable, an excusable delay must be one for which the Owner is responsible, where the delay was unreasonable under the circumstances involved, and where the delay was not within the contemplation of the parties; *however*, Contractor shall not be entitled to monetary compensation when (a) Contractor could have reasonably anticipated the delay and avoided or minimized the cost impacts of it, (b) there was a concurrent delay which does not qualify for monetary compensation under this paragraph, (c) the cause of the delay was reasonably unforeseen by the Owner or the delay was caused by factors beyond the control of the Owner, including but not limited to a delay under Section 2.2.8 above or a delay caused by a utility company's failure to perform despite Owner's reasonable arrangements for such performance; or (d) any other defense available to Owner under law or equity applies. Contractor has the burden of proving that any delay was excusable and compensable, including an analysis that establishes non-concurrency.

8.4.3 NOTICE BY CONTRACTOR REQUIRED; PROCEDURES FOR DEMANDING ADDITIONAL TIME OR MONEY

For notice and other required procedures related to requests by Contractor for additional time or money related to delay, Contractor shall comply with the Contract Documents, including but not limited to Sections 3.18 and 4.5, and Article 7, above.

8.4.4 EARLY COMPLETION

Regardless of the cause therefore, the Contractor may not maintain any Claim or cause of action against the Owner for damages incurred as a result of its failure or inability to Complete its Work on the Project in a shorter period than established in the Contract Documents, the parties stipulating that the period set forth in the Contract Documents is a reasonable time within which to perform the Work on the Project.

8.4.5 LIQUIDATED DAMAGES

Failure to Complete the Work within the time and in the manner provided for by the Contract Documents shall subject the Contractor to liquidated damages in the amount, and as described, in Article III of the Contractor's Agreement. The actual occurrence of damages and the actual amount of the damages which the Owner would suffer if the Work were not Completed within the Contract Time are dependent upon many circumstances and conditions which could prevail in various combinations and, from the nature of the case, it is impracticable and extremely difficult to fix the actual damages. Damages which the Owner would suffer in the event of such delay include, but are not limited to, loss of the use of the Work, disruption of activities, costs of administration and supervision, and the incalculable inconvenience and loss suffered by the public.

Accordingly, the parties agree that the amount set forth in the Contractor's Agreement shall be presumed to be the amount of damages which the Owner shall directly incur as a result of each

calendar day by which Completion of the Work is delayed beyond the Contract Time as adjusted by Change Orders.

If Contractor causes delay to any other contractor's work on the Project that results in delayed *completion* of the Project, Contractor shall be subject to liquidated damages for the delay in *completion* of the Project for each calendar day of delay in the amount set forth in Article III of the Contractor's Agreement. The actual occurrence of damages and the actual amount of the damages which the Owner would suffer for such delayed completion of the Project are dependent upon many circumstances and conditions which could prevail in various combinations and, from the nature of the case, it is impracticable and extremely difficult to fix the actual damages. Damages which the Owner would suffer in the event of such delay include, but are not limited to, loss of the use of the other contractor's work and the Project, disruption of activities, costs of administration and supervision, and the incalculable inconvenience and loss suffered by the public.

Accordingly, the parties agree that the amount set forth in the Contractor's Agreement shall be presumed to be the amount of damages which the Owner shall directly incur as a result of each calendar day that *completion* of the Project is delayed as a result of Contractor caused delays to any other contractor's completion of their work.

For Contractor's obligations regarding claims against Owner from other contractors on the Project alleging that Contractor caused delays to their work, see sections 3.7.4, 3.16 and 6.2.3 herein.

If liquidated damages accrue as described above, the Owner, in addition to all other remedies provided by law, shall have the right to assess the liquidated damages at any time, and to withhold liquidated damages (and any interest thereon) at any time from any and all retention or progress payments, which would otherwise be or become due the Contractor. In addition, if it is reasonably apparent to the Owner before liquidated damages begin to accrue that Contractor cannot or will not complete the Work within the Contract Time, Owner may assess and withhold, from retention or progress payments, the estimated amount of liquidated damages that will accrue in the future. If the retained percentage or withheld progress payments are not sufficient to discharge all liabilities of the Contractor incurred under this Section, the Contractor and its sureties shall continue to remain liable to the Owner until all such liabilities are satisfied in full.

If Owner accepts any work or makes any payment under the Contract after a default by reason of delays, the payment or payments shall in no respect constitute a waiver or modification of any Contract provisions regarding time of Completion and liquidated damages.

8.5 GOVERNMENT APPROVALS

Owner shall not be liable for any delays or damages related to the time required to obtain government approvals.

ARTICLE 9

PAYMENTS AND COMPLETION

9.1 CONTRACT SUM

The Contract Sum is stated in the Agreement, later adjusted by Change Orders and Construction Change Directives, and is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

9.2 COST BREAKDOWN

9.2.1 REQUIRED INFORMATION

On forms approved by the Owner, the Contractor shall furnish the following:

- A. Within ten (10) days of the mailing, faxing or delivering of the Notice of Award of the Contract, a detailed breakdown of the Contract Sum (Schedule of Values) for each Project or Site. Each item in the schedule of values shall include its proper share of the overhead and profit.
- B. Within ten (10) days of the mailing, faxing or delivering of the Notice of 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;
- C. Five (5) days prior to the submission of a pay request, an itemized breakdown of work done for the purpose of requesting partial payments;
- D. Within ten (10) days of the mailing, faxing or delivering of the Notice of Award of the Contract, the name, address, telephone number, fax number, license number and classification, and for all projects over Twenty-five Thousand Dollars (\$25,000) the public works contractor registration number, 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.

9.2.2 OWNER ACCEPTANCE REQUIRED

The Owner shall review all submissions received pursuant to paragraph 9.2.1 in a timely manner. All submissions must be accepted by the Owner before becoming the basis of any payment.

9.3 APPLICATIONS FOR PAYMENT

9.3.1 PROCEDURE

On or before the fifth (5th) 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, unless there is a construction manager for the Project or the Owner directs otherwise, an itemized Application for Payment for operations completed in accordance with the Schedule of Values through the end of the previous calendar month. Such application shall be notarized, if required, and supported by the following or such portion thereof as the applicable entity requires:

- A. 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;
- B. 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;
- C. The balance that will be due to each of such entities after said payment is made;
- D. A certification that the Record Drawings and Annotated Specifications are current;
- E. The Owner approved additions to and subtractions from the Contract Sum and Time;
- F. A summary of the retentions (each Application shall provide for retention, as set out in Article 9.6);
- G. Material invoices, evidence of equipment purchases, rentals, and other support and details of cost as the Owner may require from time to time;
- H. The percentage of Completion of the Contractor's Work by line item;
- I. 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. Such applications shall not include requests for payment of amounts the Contractor does not intend to pay to subcontractors or others because of a dispute or other reason; and
- J. Contractor's monthly reports, daily reports, and monthly schedule updates for all months of Work prior to the Application for Payment that Contractor has not previously submitted.

9.3.2 PURCHASE OF MATERIALS AND EQUIPMENT

As 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, to assure that there will be no delays, 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. If payments are to be made on account of materials and equipment not incorporated in the Work, but delivered and suitably stored at the Site or at some other location agreed upon in writing by the Owner, the payments shall be conditioned upon submission by the Contractor, Subcontractor, or vendor of bills of sale and such other documents satisfactory to 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, including, without limitation, provision of applicable insurance and transportation to the Site. 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, if stored off-Site, stored only in a bonded warehouse.

9.3.3 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. Transfer of title to Work does not constitute a waiver by Owner of any defects in the Work.

9.4 REVIEW OF PROGRESS PAYMENT

9.4.1 OWNER ACCEPTANCE

The Owner will, within seven (7) days after receipt of the Contractor's Application for Payment, either accept such payment or notify the Contractor in writing of the Owner's reasons for withholding acceptance in whole or in part as provided in paragraph 9.5.1.

9.4.2 OWNER'S REVIEW

The review of the Contractor's Application for Payment by the Owner will be based, at least in part, on the Owner's observations at the Site and the data comprising the Application for Payment that the Work has progressed to the point indicated. The review is also 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 Owner. The Owner may reject the Application for Payment if it is not complete under section 9.3. The issuance of a Certificate for

Payment will constitute a representation that the Contractor is entitled to payment in the amount certified, subject to any specific qualifications Owner expresses in the Certificate for Payment. However, Contractor's entitlement to payment may be affected by subsequent evaluations of the Work for conformance with the Contract Documents, test and inspections and discovery of minor deviations from the Contract Documents correctable prior to Completion. The issuance of a Certificate for Payment will not be a waiver by the Owner of any defects in the Work covered by the Application for Payment, nor will it be a representation that the Owner has:

- A. Made exhaustive or continuous on-Site inspections to check the quality or quantity of the Work;
- B. Reviewed construction means, methods, techniques, sequences, or procedures;
- C. 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
- D. Made an examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

9.5 DECISIONS TO WITHHOLD PAYMENT

9.5.1 REASONS TO WITHHOLD PAYMENT

The Owner may withhold from a progress payment, in whole or in part, to such extent as may be necessary to protect the Owner due to any of the following:

- A. Defective or incomplete Work not remedied;
- B. Stop Payment Notices. For any stop payment notice, the Owner shall withhold the amount stated in the stop payment notice, the stop notice claimant's anticipated interest and court costs and an amount to provide for the public entity's reasonable cost of any litigation pursuant to the stop payment notice. For any stop payment notice action the parties resolve before judgment is entered, Owner has the right to permanently withhold for any reasonable cost of litigation for that stop payment notice, even if it exceeds the amount originally withheld by Owner for the estimated reasonable cost of litigation. However, if (1) the Contractor at its sole expense provides a bond or other security satisfactory to the Owner in the amount of at least one hundred twenty-five percent (125%) of the claim, in a form satisfactory to the Owner, which protects the Owner against such claim, and (2) the Owner chooses to accept the bond, then Owner would release the withheld stop payment notice funds to the Contractor, except that Owner may permanently withhold for any reasonable cost of litigation. Any stop payment notice release bond shall be executed by a California admitted, fiscally solvent surety, completely unaffiliated with and separate from the surety on the payment and performance bonds, that does not have any assets pooled with the payment and

performance bond sureties.

- C. Liquidated damages against the Contractor, whether already accrued or estimated to accrue in the future;
- D. Reasonable doubt that the Work can be Completed for the unpaid balance of any Contract Sum or within the Contract Time;
- E. Damage to the property or work of the Owner, another contractor, or subcontractor;
- F. Unsatisfactory prosecution of the Work by the Contractor;
- G. Failure to store and properly secure materials;
- H. Failure of the Contractor to submit on a timely basis, proper and sufficient documentation required by the Contract Documents, including, without limitation, monthly progress schedules, shop drawings, submittal schedules, schedule of values, product data and samples, proposed product lists, executed change orders, and verified reports;
- I. Failure of the Contractor to maintain record drawings;
- J. Erroneous estimates by the Contractor of the value of the Work performed, or other false statements in an Application for Payment;
- K. Unauthorized deviations from the Contract Documents;
- L. Failure of the Contractor to prosecute the Work in a timely manner in compliance with established progress schedules and Completion deadlines;
- M. Subsequently discovered evidence or observations nullifying the whole or part of a previously issued Certificate for Payment;
- N. Failure by Contractor to pay Subcontractors or material suppliers as required by Contract or law, which includes but is not limited to Contractor's failure to pay prevailing wage and any assessment of statutory penalties;
- O. Overpayment to Contractor on a previous payment;
- P. Credits owed to Owner for reduced scope of work or work that Contractor will not perform;
- Q. The estimated cost of performing work pursuant to Section 2.4;
- R. Actual damages related to false claims by Contractor;

- S. Breach of any provision of the Contract Documents;
- T. Owner's potential or actual loss, liability or damages caused by the Contractor; and
- U. As permitted by other provisions in the Contract or as otherwise allowed by law, including statutory penalties Owner or other entities assessed against Contractor. (See e.g., Labor Code section 1813 (working hours) or Public Contract Code section 4110 (subcontractor listings and substitutions))

Owner may, but is not required to, provide to Contractor with the progress payment written notice of the items for which Owner is withholding amounts from the payment. To claim wrongful withholding by the Owner, or if Contractor otherwise disputes any amount being withheld, Contractor must submit an inquiry in writing to Owner within thirty (30) days of receipt of the notice, and Owner shall respond within fifteen (15) days of receipt of the inquiry. If any disputed issues remain unresolved after Owner's response, Contractor shall timely submit a Claim pursuant to Section 4.5.

For any withhold amount based on an estimate where the actual amount later becomes known and certain, no later than the final accounting for the Contract the Owner will release any amount withheld over that certain and known amount. If the certain and known amount exceeds the amount previously withheld, Owner may withhold additional amounts from Contractor to cover the excess amount. If available funds are not sufficient, Contractor shall pay Owner the difference.

9.5.2 PAYMENT AFTER CURE

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

9.5.3 OVERPAYMENT AND/OR FAILURE TO WITHHOLD

Neither Owner's overpayment to Contractor, nor Owner's failure to withhold an amount from payment that Owner had the right to withhold, shall constitute a waiver by Owner of its rights to withhold those amounts from future payments to Contractor or to otherwise pursue recovery of those amounts from Contractor.

9.6 PROGRESS PAYMENTS

9.6.1 PAYMENTS TO CONTRACTOR

Unless otherwise stated in the Contract Documents, within thirty (30) days after receipt of an undisputed and properly submitted Application for Payment, Contractor shall be paid a sum

equal to ninety-five percent (95%) of the undisputed value of the Work performed up to the last day of the previous month, less the aggregate of previous payments; and Owner shall retain the other five percent (5%) of the undisputed value of the Work. 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. Contractor shall base an Application for Payment only on the original Contract Sum plus any fully executed and Board-approved Change Orders. Contractor shall not include Notices of Potential Claims, CORs, Claims or disputed amounts.

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 uncomplied with. Payment shall not be a waiver of any such direction.

9.6.2 PAYMENTS TO SUBCONTRACTORS

No later than ten (10) days after receipt of payment from Owner, pursuant to Business and Professions Code section 7108.5, the Contractor shall pay to each Subcontractor, out of the amount paid to the Contractor on account of such Subcontractor's portion of the Work, the amount to which said Subcontractor is entitled, 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.

9.6.3 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.

9.6.4 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.

9.6.5 PAYMENT TO SUPPLIERS

Payment to material or equipment suppliers shall be treated in a manner similar to that provided in paragraphs 9.6.2, 9.6.3 and 9.6.4.

9.6.6 PAYMENT NOT CONSTITUTING APPROVAL OR ACCEPTANCE

An accepted Application for Payment, issuance of a Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance or approval of any portion of the Work, especially any Work not in accordance with the Contract

Documents.

9.6.7 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. However, Owner has no duty to issue joint checks. 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.

9.7 COMPLETION OF THE WORK

9.7.1 CLOSE-OUT PROCEDURES

When the Contractor considers that the Work is Complete and submits a written notice to Owner requesting an inspection of the Work, the Owner shall review the Work and prepare and submit to the Contractor a comprehensive list of items to be completed or corrected (the "Punch List"). The Punch List shall include all outstanding obligations of Contractor, including training, start-up, testing, and submission to Owner of all required documentation (e.g., written guarantees, warranties, invoices, as-built drawings, manuals, bonds and the documents described in Sections 9.3 and 9.9). The Contractor and/or its Subcontractors shall proceed promptly to complete and correct items on the Punch List. Failure to include an item on the Punch List does not alter the responsibility of the Contractor to Complete all Work (including the omitted item) in accordance with the Contract Documents, and to Complete or correct the Work so long as the statute of limitations (or repose) has not run.

When the Contractor believes the Punch List work is complete and in accordance with the Contract Documents, it shall then submit a request for an additional inspection by the Owner to determine Completion. Owner shall again inspect the Work and inform the Contractor of any items that are not complete or correct. Contractor shall promptly complete or correct items until no items remain.

After the Work, including all Punch List Work, is inspected and informally deemed by the Owner to be Complete, the Owner's governing body may formally accept the Work as Complete at a meeting of the governing body. Warranties required by the Contract Documents shall commence on the date of Contractor's Completion of the Work (see Sections 3.5, 12.2.5, and 12.2.6).

9.7.2 COSTS OF MULTIPLE INSPECTIONS

More than two (2) requests by Contractor to make inspections to confirm Completion as required under paragraph 9.7.1 shall be considered an additional service of Owner, and all subsequent costs will be invoiced to Contractor and withheld from remaining payments.

9.8 PARTIAL OCCUPANCY OR USE

The Owner may occupy or use any completed, or partially completed, portion of the Work at any stage prior to acceptance, or prior to Completion if there is no formal acceptance. Occupancy or use of any portion of the Work, or the whole Work, shall not constitute approval or acceptance of it, nor shall such occupancy or use relieve Contractor of any of its obligations under the Contract Documents regarding that portion of, or the whole, Work.

The Owner and the Contractor shall agree in writing to the responsibilities assigned to each of them for payments, security, maintenance, heat, utilities, damage to the Work, insurance, the period for correction of the Work, and the commencement of warranties required by the Contract Documents. When the Contractor considers a portion complete, the Contractor may request an inspection of that portion and preparation of a Punch List by the Owner for that portion, as set forth for the entire Work under paragraph 9.7.1; however, such inspection and Punch List shall not act as any form of approval or acceptance of that portion of the Work, or of any Work not complying with the requirements of the Contract, and that portion shall be subject to subsequent inspections and Punch Lists.

Immediately prior to such partial occupancy or use, the Owner, the Architect and the Contractor shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

9.9 FINAL PROGRESS PAYMENT AND RELEASE OF RETENTION

9.9.1 FINAL APPLICATION FOR PROGRESS PAYMENT

When, pursuant to Section 9.7.1, the Owner finds all of the Work is Completed in accordance with the Contract Documents, it shall so notify Contractor, who shall then submit to the Owner its final Application for Payment.

Upon receipt and approval of such final Application for Payment, the Owner shall issue a final Certificate of Payment, based on its knowledge, information, and belief, and on the basis of its observations, inspections, and all other data accumulated or received by the Owner in connection with the Work, that such Work has been Completed in accordance with the Contract Documents. If required to do so under Labor Code section 1773.3, subd. (d), Owner shall withhold final payment.

9.9.2 PROCEDURES FOR APPLICATION FOR FINAL PROGRESS PAYMENT

The Application for Final Progress Payment pursuant to Section 9.9.1 shall be accompanied by the same details as set forth in paragraph 9.3, and in addition, the following conditions must be fulfilled:

- A. The Work shall be Complete, and 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.

- B. 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, and Contractor delivered them to the Owner.
- C. The Contractor shall deliver to the Owner (i) 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, (ii) all warranties and guarantees, (iii) operation and maintenance instructions, manuals and materials for equipment and apparatus, and (iv) all other documents required by the Contract Documents.
- D. Contractor shall provide extensive assistance in the utilization of any equipment or system such as initial start-up or testing, adjusting and balancing, preparation of operation and maintenance manuals and training personnel for operation and maintenance.

Acceptance of Final Progress Payment shall constitute a complete waiver of Claims except for those previously identified in writing and identified by that payee as unsettled at the time of Final Progress Payment.

9.9.3 RELEASE OF RETAINAGE

Owner may withhold from release or payment of retainage (or "retention") up to 150% of disputed amounts listed in Section 9.5. If retainage is held in an escrow account pursuant to an escrow agreement under Public Contract Code section 22300 (see Section 9.10) and Owner withholds from release of retainage based on a breach of the Contract, or other default, by Contractor, Owner may withdraw the withheld retainage from the escrow account. Owner shall release the undisputed retainage within sixty (60) days after Completion of the Work. For this purpose, "Completion" is defined in Public Contract Code section 7107(c). No interest shall be paid on any retainage, or on any amounts withheld, except as provided to the contrary in any Escrow Agreement and General Conditions between the Owner and the Contractor under Public Contract Code section 22300.

9.10 SUBSTITUTION OF SECURITIES

In accordance with section 22300 of the Public Contract Code, the Owner will permit the substitution of securities for any retention monies withheld by the Owner to ensure performance under the Contract. At the request and expense of the Contractor, securities equivalent to the amount withheld shall be deposited with the Owner, or with a state or federally chartered bank as the escrow agent, who shall then pay such retention monies to the Contractor. Upon Completion of the Contract, the securities shall be returned to the Contractor if Owner has no basis to withhold under the Contract Documents.

Securities eligible for investment under this section shall include those listed in Government Code section 16430, bank or savings and loan certificates of deposit, interest-bearing, demand-deposit accounts, standby letters of credit, or any other security mutually agreed to by the Contractor and the Owner.

The Contractor shall be the beneficial owner of any securities substituted for monies withheld and shall receive any interest thereon.

Any escrow agreement entered by Owner and Contractor pursuant to Public Contract Code section 22300, shall be substantially similar to the form set forth in Public Contract Code section 22300.

ARTICLE 10

PROTECTION OF PERSONS AND PROPERTY

10.1 SAFETY PRECAUTIONS AND PROGRAMS

10.1.1 CONTRACTOR RESPONSIBILITY

The Contractor shall have responsibility for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract. Each Contractor shall designate a responsible member of its organization whose duties shall include loss and accident prevention, and who shall have the responsibility and full authority to enforce the program. This person shall attend meetings with the representatives of the various Subcontractors employed to ensure that all employees understand and comply with the programs. Contractor will ensure that his employees and Subcontractors cooperate and coordinate safety matters with any other contractors on the Project to form a joint safety effort.

10.1.2 SUBCONTRACTOR RESPONSIBILITY

Subcontractors have the responsibility for participating in, and enforcing, the safety and loss prevention programs established by the Contractor for the Project, which will cover all Work performed by the Contractor and its Subcontractors. Each Subcontractor shall designate a responsible member of its organization whose duties shall include loss and accident prevention, and who shall have the responsibility and full authority to enforce the program. This person shall attend meetings with the representatives of the various Subcontractors employed to ensure that all employees understand and comply with the programs.

10.1.3 COOPERATION

All Subcontractors and material or equipment suppliers, shall cooperate fully with Contractor, the Owner, and all insurance carriers and loss prevention engineers.

10.1.4 ACCIDENT REPORTS

Subcontractors shall promptly report in writing to the Contractor all accidents whatsoever arising out of, or in connection with, the performance of the Work, whether on or off the Site, which caused death, personal injury, or property damage, giving full details and statements of witnesses. In addition, if death or serious injuries or serious damages are caused, the accident shall be reported immediately by telephone or messenger. Contractor shall thereafter promptly report the facts in writing to the Owner giving full details of the accident.

10.1.5 FIRST-AID SUPPLIES AT SITE

The Contractor will provide and maintain at the Site first-aid supplies for minor injuries.

10.2 SAFETY OF PERSONS AND PROPERTY

10.2.1 THE CONTRACTOR

The Contractor shall take reasonable precautions for the safety of, and shall provide reasonable protection to prevent damage, injury, or loss to:

- A. Employees on the Work and other persons who may be affected thereby;
- B. The Work, material, equipment, tools, construction equipment, and machinery to be incorporated therein or necessary for the proper execution and Completion of the Work, whether in storage on or off the Site, under the care, custody, or control of the Contractor or the Contractor's Subcontractors or Sub-subcontractors; and
- C. Other property at the Site or adjacent thereto such as trees, shrubs, lawns, walks, pavement, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

10.2.2 CONTRACTOR NOTICES

The Contractor shall give notices and comply with applicable laws, ordinances, rules, regulations, and lawful orders of public authorities bearing on the safety of persons or property or their protection from damage, injury, or loss.

10.2.3 SAFETY BARRIERS AND SAFEGUARDS

The Contractor shall erect and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations, and notifying owners and users of adjacent Sites and utilities.

10.2.4 USE OR STORAGE OF HAZARDOUS MATERIAL

When use or storage of explosives, other hazardous materials or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel. The Contractor shall notify the Owner any time that explosives or hazardous materials are expected to be stored on Site. Location of storage shall be coordinated with the Owner and local fire authorities.

10.2.5 FINGERPRINTING

At its own expense, Contractor shall comply with all fingerprinting requirements under law and Contract, including but not limited to the requirements of Education Code section 45125.2 and the Independent Contractor Student Contact Form which is a part of the Contract. Contractor shall hold harmless, defend and indemnify the Owner under section 3.16, for any costs, including attorneys' fees, Owner incurs from Contractor's failure to comply.

10.3 PROTECTION OF WORK AND PROPERTY

10.3.1 PROTECTION OF WORK

The Contractor and Subcontractors shall continuously protect the Work, the Owner's property, and the property of others, from damage, injury, or loss until the earlier of formal acceptance of the Work or Completion of the Work. The Contractor and Subcontractors shall make good any such damage, injury, or loss, except such as may be solely due to, or caused by, agents or employees of the Owner.

10.3.2 PROTECTION FOR ELEMENTS

The Contractor will remove all mud, water, or other elements as may be required for the proper protection and prosecution of its Work. The Contractor shall at all times provide heat, coverings, and enclosures necessary to maintain adequate protection against weather so as to preserve the Work, materials, equipment, apparatus, and fixtures free from injury or damage.

10.3.3 SHORING AND STRUCTURAL LOADING

The Contractor shall not impose structural loading upon any part of the Work under construction or upon existing construction on or adjacent to the Site in excess of safe limits, or loading such as to result in damage to the structural, architectural, mechanical, electrical, or other components of the Work. The design of all temporary construction equipment and appliances used in construction of the Work and not a permanent part thereof, including, without limitation, hoisting equipment, cribbing, shoring, and temporary bracing of structural steel, is the sole responsibility of the Contractor. All such items shall conform to the requirements of governing codes and all laws, ordinances, rules, regulations, and orders of all authorities having jurisdiction. The Contractor shall take special precautions, such as shoring of masonry walls and temporary tie bracing of structural steel work, to prevent possible wind damage during construction of the Work. The installation of such bracing or shoring shall not damage or cause damage to the Work.

in place or the Work installed by others. Any damage which does occur shall be promptly repaired by the Contractor at no cost to the Owner.

10.3.4 CONFORMANCE WITHIN ESTABLISHED LIMITS

The Contractor and Subcontractors shall confine their construction equipment, the storage of materials, and the operations of workers to the limits indicated by laws, ordinances, permits, and the limits established by the Owner, and shall not unreasonably encumber the premises with construction equipment or materials.

10.3.5 SUBCONTRACTOR ENFORCEMENT OF RULES

Subcontractors shall enforce the Owner's and the Contractor's instructions, laws, and regulations regarding signs, advertisements, fires, smoking, the presence of liquor, and the presence of firearms by any person at the Site.

10.3.6 SITE ACCESS

The Contractor and the Subcontractors shall use only those ingress and egress routes designated by the Owner, observe the boundaries of the Site designated by the Owner, park only in those areas designated by the Owner, which areas may be on or off the Site, and comply with any parking control program established by the Owner such as furnishing license plate information and placing identifying stickers on vehicles.

10.3.7 PROTECTION OF MATERIALS

The Contractor and the Subcontractors shall receive, count, inspect for damage, record, store, and protect construction materials for the Work and Subcontractors shall promptly send to the Contractor evidence of receipt of such materials, indicating thereon any shortage, change, or damage (failure to so note shall constitute acceptance by the Subcontractor of financial responsibility for any shortage).

10.4 EMERGENCIES

10.4.1 EMERGENCY ACTION

In an emergency affecting the safety of persons or property, the Contractor shall take any action necessary, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional money or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Section 4.5 and Article 7.

10.4.2 ACCIDENT REPORTS

The Contractor shall promptly report in writing to the Owner all accidents arising out of or in connection with the Work, which caused death, personal injury, or property damage, giving full details and statements of any witnesses. In addition, if death, serious personal injuries, or serious

property damages are caused, the accident shall be reported immediately by telephone or messenger to the Owner.

10.5 HAZARDOUS MATERIALS

10.5.1 DISCOVERY OF HAZARDOUS MATERIALS

In the event the Contractor encounters or suspects the presence on the Site material reasonably believed to be asbestos, polychlorinated biphenyl (PCB), or any other material defined as being hazardous by section 25249.5 of the California Health and Safety Code, which (a) has not been rendered harmless, and (b) the handling or removal of which is not within the scope of the Work, the Contractor shall immediately stop Work in the area affected and report the condition to the Owner and the Architect in writing, whether such material was generated by the Contractor, another contractor, or the Owner. The Work in the affected area shall not thereafter be resumed, except by written agreement of the Owner and the Contractor, if in fact the material is asbestos, polychlorinated biphenyl (PCB), or other hazardous material, and has not been rendered harmless. The Work in the affected area shall be resumed only in the absence of asbestos, polychlorinated biphenyl (PCB), or other hazardous material, or when it has been rendered harmless by written agreement of the Owner and the Contractor.

10.5.2 HAZARDOUS MATERIAL WORK LIMITATIONS

In the event that the presence of hazardous materials is suspected or discovered on the Site, the Owner shall retain an independent testing laboratory to determine the nature of the material encountered and whether corrective measures or remedial action is required. The Contractor shall not be required pursuant to Article 7 to perform without consent any Work in the affected area of the Site relating to asbestos, polychlorinated biphenyl (PCB), or other hazardous material, until any known or suspected hazardous material has been removed, or rendered harmless, or determined to be harmless by Owner, as certified by an independent testing laboratory and/or approved by the appropriate government agency.

10.5.3 INDEMNIFICATION BY OWNER FOR HAZARDOUS MATERIAL NOT CAUSED BY CONTRACTOR

In the event the presence of hazardous materials on the Site is not caused by the Contractor, Owner shall pay for all costs of testing and remediation, if any, and shall compensate Contractor for any delay or additional costs incurred in accordance with the applicable provisions of Article 7 and 8 herein. Owner shall defend, indemnify and hold harmless the Contractor and its agents, officers, directors and employees from and against any and all claims, damages, losses, costs and expenses incurred in connection with or arising out of, or relating to, the performance of the Work in the area affected by the hazardous material, except to the extent the claims, damages, losses, costs, or expenses were caused by Contractor's active negligence, sole negligence or willful misconduct. By providing this indemnification, Owner does not waive any immunities.

10.5.4 NATURALLY OCCURRING ASBESTOS

If the Site is found to contain naturally occurring asbestos (asbestos naturally contained in rocks

which can become airborne when released “NOA”), in addition to complying with applicable provisions in sections 10.5.1-10.5.3 above, Contractor shall comply with, and be solely responsible for, all applicable NOA requirements of the California Air Resources Board (CARB), California Department of Industrial Relations, California Division of Occupational Safety and Health (Cal/OSHA), any local air quality management district with jurisdiction over the Site, the County, and all other applicable federal, State and local governmental entities. This compliance and responsibility includes, but is not limited to, dust control mitigation measures and a monitoring plan.

10.5.5 INDEMNIFICATION BY CONTRACTOR FOR HAZARDOUS MATERIAL CAUSED BY CONTRACTOR

In the event the presence of hazardous materials on the Site is caused by Contractor, Subcontractors, materialmen or suppliers, the Contractor shall pay for all costs of testing and remediation, if any, and shall compensate the Owner for any additional costs incurred as a result of the generation of hazardous material on the Project Site. In addition, the Contractor shall defend, indemnify and hold harmless Owner and its agents, officers, and employees from and against any and all claims, damages, losses, costs and expenses incurred in connection with, arising out of, or relating to, the presence of hazardous material on the Site, except to the extent the claims, damages, losses, costs, or expenses were caused by Owner’s active negligence, sole negligence or willful misconduct.

10.5.6 TERMS OF HAZARDOUS MATERIAL PROVISION

The terms of this Hazardous Material provision shall survive the Completion of the Work and/or any termination of this Contract.

10.5.7 ARCHEOLOGICAL MATERIALS

In the event the Contractor encounters or reasonably suspects the presence on the Site of archeological materials, the Contractor shall immediately stop Work in the area affected and report the condition to the Owner and the Architect in writing. The Work in the affected area shall not thereafter be resumed, except after Contractor’s receipt of written notice from the Owner.

ARTICLE 11

INSURANCE AND BONDS

11.1. CONTRACTOR’S LIABILITY INSURANCE

11.1.1 LIABILITY INSURANCE REQUIREMENTS

11.1.1 By the earlier of the deadline set forth in the Instructions to Bidders or the commencement of the Work and within limits acceptable to the Owner, the Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in

California as admitted carriers with a financial rating of at least A+, Class XII status as rated in the most recent edition of Best's Insurance Reports such commercial general liability insurance per occurrence for bodily injury, personal injury and property damage as set forth in the Agreement and automobile liability insurance per accident for bodily injury and property damage combined single limit as set forth in the Agreement as will protect the Contractor from claims set forth below, which may arise out of or result from the Contractor's operations under the Contract and for which the Contractor may be legally liable, whether such operations are by the Contractor, by a Subcontractor, by Sub-subcontractor, by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

- 11.1.1.1 claims for damages because of bodily injury (including emotional distress), sickness, disease, or death of any person other than the Contractor's employees. This coverage shall be provided in a form at least as broad as Insurance Services Office (ISO) Form CG 0001 11188;
- 11.1.1.2 claims for damages arising from personal or advertising injury in a form at least as broad as ISO Form CG 0001 11188;
- 11.1.1.3 claims for damages because of injury or destruction of tangible property, including loss of use resulting therefrom, arising from operations under the Contract Documents; and
- 11.1.1.4 claims for damages because of bodily injury, death of a person, or property damage arising out of the ownership, maintenance, or use of a motor vehicle, all mobile equipment, and vehicles moving under their own power and engaged in the Work; and
- 11.1.1.5 claims involving blanket contractual liability applicable to the Contractor's obligations under the Contract Documents, including liability assumed by and the indemnity and defense obligations of the Contractor and the Subcontractors; and
- 11.1.1.6 claims involving Completed Operations, Independent Contractors' coverage, and Broad Form property damage, without any exclusions for collapse, explosion, demolition, underground coverage, and excavating. (XCU)

If commercial general liability insurance or another insurance form with a general aggregate limit is used, either the general aggregate limit shall apply separately to the project location (with the ISO CG 2501 or insurer's equivalent endorsement provided to the Owner) or the general aggregate limit shall be twice the required occurrence limit.

Any deductible or self-insured retention must be declared to and approved by the Owner. At the option of the Owner, either the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects the Owner, its Board of Trustees,

members of its Board of Trustees, officers, employees, agents and volunteers; or the Contractor shall procure a bond guaranteeing payment of losses and related investigations, claim administration and defense expenses.

11.1.2 SUBCONTRACTOR INSURANCE REQUIREMENTS

The Contractor shall require its Subcontractors and any Sub-subcontractors to take out and maintain similar public liability insurance and property damage insurance, in a company or companies lawfully authorized to do business in California as admitted carriers with a financial rating of at least A+, Class XII status as rated in the most recent edition of Best's Insurance Reports, in like amounts and scope of coverage.

11.1.3 OWNER'S INSURANCE

The Owner shall be responsible for purchasing and maintaining the Owner's usual liability insurance. Optionally, the Owner may purchase and maintain other insurance for self protection against claims which may arise from operations under the Contract. The Contractor shall not be responsible for purchasing and maintaining this optional Owner's liability insurance unless specifically required by the Contract Documents.

11.1.4 ADDITIONAL INSURED ENDORSEMENT REQUIREMENTS

The Contractor shall name, on any policy of insurance, the Owner and the Architect as additional insureds. Subcontractors shall name the Contractor, the Owner and the Architect as additional insureds. The Additional Insured Endorsement included on all such insurance policies shall state that coverage is afforded the additional insured with respect to claims arising out of operations performed by or on behalf of the insured. If the additional insureds have other insurance which is applicable to the loss, such other insurance shall be excess to any policy of insurance required herein. The amount of the insurer's liability shall not be reduced by the existence of such other insurance.

11.1.5 WORKERS' COMPENSATION INSURANCE

During the term of this Contract, the Contractor shall provide workers' compensation insurance for all of the Contractor's employees engaged in Work under this Contract on or at the Site of the Project and, in case any of the Contractor's work is sublet, the Contractor shall require the Subcontractor to provide workers' compensation insurance for all the Subcontractor's employees engaged in Work under the subcontract. Any class of employee or employees not covered by a Subcontractor's insurance shall be covered by the Contractor's insurance. In case any class of employees engaged in Work under this Contract on or at the Site of the Project is not protected under the Workers' Compensation laws, the Contractor shall provide or cause a Subcontractor to provide adequate insurance coverage for the protection of those employees not otherwise protected. The Contractor shall file with the Owner certificates of insurance as required under this Article and in compliance with Labor Code section 3700.

If the contractor fails to maintain such insurance, the Owner may take out compensation

insurance which the Owner might be liable to pay under the provisions of the Act by reason of an employee of the Contractor being injured or killed, and withhold from progress payments and/or retention the amount of the premium for such insurance.

11.1.6 BUILDER'S RISK/"ALL RISK" INSURANCE

11.1.6.1 COURSE-OF-CONSTRUCTION INSURANCE REQUIREMENTS

Unless provided by Owner at Owner's sole discretion, Contractor, during the progress of the Work and until final acceptance of the Work by Owner upon Completion of the entire Contract, shall maintain Builder's Risk/Course-of-Construction insurance satisfactory to the Owner, issued on a completed value basis on all insurable Work included under the Contract Documents. This insurance shall insure against all risks, including but not limited to the following perils: vandalism, theft, malicious mischief, fire, sprinkler leakage, civil authority, sonic boom, explosion, collapse, flood, earthquake (for projects not solely funded through revenue bonds, limited to earthquakes equivalent to or under 3.5 on the Richter Scale in magnitude), wind, hail, lightning, smoke, riot or civil commotion, debris removal (including demolition) and reasonable compensation for the Architect's services and expenses required as a result of such insured loss. This insurance shall provide coverage in an amount not less than the full cost to repair, replace or reconstruct the Work. Such insurance shall include the Owner, the Architect, and any other person or entity with an insurable interest in the Work as an additional named insured.

The Contractor shall submit to the Owner for its approval all items deemed to be uninsurable under the Builder's Risk/Course-of-Construction insurance. The risk of the damage to the Work due to the perils covered by the Builder's Risk/Course-of-Construction insurance, as well as any other hazard which might result in damage to the Work, is that of the Contractor and the surety, and no claims for such loss or damage shall be recognized by the Owner, nor will such loss or damage excuse the Complete and satisfactory performance of the Contract by the Contractor.

11.1.7 CONSENT OF INSURER FOR PARTIAL OCCUPANCY OR USE

Partial occupancy or use in accordance with the Contract Documents shall not commence until the insurance company providing property insurance has consented to such partial occupancy or use by endorsement or otherwise. The Owner and the Contractor shall take reasonable steps to obtain consent of the insurance company and shall, without mutual consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse, or reduction of the insurance.

11.1.8 FIRE INSURANCE

Before the commencement of the Work, the Contractor shall procure, maintain, and cause to be maintained at the Contractor's expense, fire insurance on all Work included under the Contract Documents, insuring the full replacement value of such Work as well as the cost of any removal and demolition necessary to replace or repair all Work damaged by fire. The amount of fire insurance shall be subject to approval by the Owner and shall be sufficient to protect the Work against loss or damage in full until the Work is accepted by the Owner. Should the Work being

constructed be damaged by fire or other causes during construction, it shall be replaced in accordance with the requirements of the drawings and specifications without additional expense to the Owner.

11.1.9 OTHER INSURANCE

The Contractor shall provide all other insurance required to be maintained under applicable laws, ordinances, rules, and regulations.

11.1.10 PROOF OF CARRIAGE OF INSURANCE

The Contractor shall not commence Work nor shall it allow any Subcontractor to commence Work under this Contract until all required insurance, certificates, and an Additional Insured Endorsement and Declarations Page have been obtained and delivered in duplicate to the Owner for approval subject to the following requirements:

- (a) Certificates and insurance policies shall include the following clause:

This policy shall not be non-renewed, canceled, or reduced in required limits of liability or amounts of insurance until notice has been mailed to the Owner. Date of cancellation or reduction may not be less than thirty (30) days after the date of mailing notice.

- (b) Certificates of insurance shall state in particular those insured, the extent of insurance, location and operation to which the insurance applies, the expiration date, and cancellation and reduction notices.
- (c) Certificates of insurance shall clearly state that the Owner and the Architect are named as additional insureds under the policy described and that such insurance policy shall be primary to any insurance or self-insurance maintained by Owner and any other insurance carried by the Owner with respect to the matters covered by such policy shall be excess and non-contributing.
- (d) The Contractor and its Subcontractors shall produce a certified copy of any insurance policy required under this Section upon written request of the Owner.

11.1.11 COMPLIANCE

In the event of the failure of any contractor to furnish and maintain any insurance required by this Article, the Contractor shall be in default under the Contract. Compliance by Contractor with the requirement to carry insurance and furnish certificates, policies, Additional Insured Endorsement and Declarations Page evidencing the same shall not relieve the Contractor from liability assumed under any provision of the Contract Documents, including, without limitation, the obligation to defend and indemnify the Owner and the Architect.

11.2 PERFORMANCE AND PAYMENT BONDS

11.2.1 BOND REQUIREMENTS

Unless otherwise specified in the Contract Documents, prior to commencing any portion of the Work, the Contractor shall apply for and furnish Owner separate payment and performance bonds for its portion of the Work which shall cover 100% faithful performance of and payment of all obligations arising under the Contract Documents and/or guaranteeing the payment in full of all claims for labor performed and materials supplied for the Work. All bonds shall be provided by a corporate surety authorized and admitted to transact business in California. All bonds shall be submitted on the Owner's approved form.

To the extent, if any, that the Contract Sum is increased in accordance with the Contract Documents, the Contractor shall cause the amount of the bonds to be increased accordingly and shall promptly deliver satisfactory evidence of such increase to the Owner. To the extent available, the bonds shall further provide that no change or alteration of the Contract Documents (including, without limitation, an increase in the Contract Sum, as referred to above), extensions of time, or modifications of the time, terms, or conditions of payment to the Contractor will release the surety. If the Contractor fails to furnish the required bond, the Owner may terminate the Contract for cause.

11.2.2 SURETY QUALIFICATION

Only bonds executed by admitted Surety insurers as defined in Code of Civil Procedure section 995.120 shall be accepted. The surety insurers must, unless otherwise agreed to by Owner in writing, at the time of issuance of the bonds, have a rating not lower than "A-" as rated by A.M. Best Company, Inc. or other independent rating companies. Owner reserves the right to approve or reject the surety insurers selected by Contractor and to require Contractor to obtain bonds from surety insurers satisfactory to the Owner.

ARTICLE 12

UNCOVERING AND CORRECTION OF WORK

12.1 UNCOVERING OF WORK

12.1.1 UNCOVERING WORK FOR REQUIRED INSPECTIONS

If a portion of the Work is covered contrary to the Owner's request or to requirements specifically expressed in the Contract Documents, Contractor must, if required in writing by the Owner, uncover it for the Owner's observation and replace the removed work at the Contractor's expense without change in the Contract Sum or Time.

12.1.2 COSTS FOR INSPECTIONS NOT REQUIRED

If a portion of the Work has been covered which the Owner has not specifically requested to observe prior to its being covered, the Owner may request to see such work, and it shall be uncovered by the Contractor. If such work is in accordance with the Contract Documents, costs of uncover and replacement shall, by appropriate Change Order, be paid by the Owner. If such work is not in accordance with Contract Documents, the Contractor shall pay such costs, unless the condition was caused by the Owner or a separate contractor, in which event the Owner shall be responsible for payment of such costs to the Contractor.

12.2 CORRECTION OF WORK; WARRANTY

12.2.1 CORRECTION OF REJECTED WORK

The Contractor shall promptly correct the work rejected by the Owner for failing to conform to the requirements of the Contract Documents, until the statutes of limitation (or repose) and all warranties have run, as applicable, and whether or not fabricated, installed or completed. The Contractor shall bear costs of correcting the rejected work, including additional testing, inspections, and compensation for the Owner's expenses and costs incurred.

12.2.2 REMOVAL OF NONCONFORMING WORK

The Contractor shall remove from the Site portions of the Work which are not in accordance with the requirements of the Contract Documents and are not corrected by the Contractor or accepted or approved by the Owner.

12.2.3 OWNER'S RIGHTS IF CONTRACTOR FAILS TO CORRECT

If the Contractor fails to correct nonconforming work within a reasonable time, the Owner may correct it in accordance with Section 2.4. As part of Owner's correction of the work, the Owner may remove any portion of the nonconforming Work and store any salvageable materials or equipment at the Contractor's expense. If the Contractor does not pay costs of such removal and storage within ten (10) days after written notice, the Owner may upon ten (10) additional days

written notice sell such material or equipment at auction or at private sale and shall account for the proceeds thereof, after deducting costs and damages that should have been borne by the Contractor, including compensation for the Architect's and other professionals and representatives' services and expenses, made necessary thereby. If such proceeds of sale do not cover costs which the Contractor should have borne, the Contractor shall be invoiced for the deficiency or Owner may withhold such costs from payment pursuant to Section 9.5. If progress payments or retention then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the Owner.

12.2.4 COST OF CORRECTING THE WORK

The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or separate contractors, whether completed or partially completed, caused by the Contractor's correction or removal of the nonconforming work.

12.2.5 WARRANTY CORRECTIONS (INCLUDES REPLACEMENT)

Pursuant to the warranty in Section 3.5, if within one (1) year after the Completion of the Work or within a longer time period for an applicable special warranty or guarantee required by the Contract Documents, any of the Work does not comply with the Contract Documents, the Contractor shall correct it after receipt of Owner's written notice to do so, unless the Owner has previously waived in writing such right to demand correction. Contractor shall correct the Work promptly, and passage of the applicable warranty period shall not release Contractor from its obligation to correct the Work if Owner provided the written notice within the applicable warranty period. Contractor's obligation to correct the warranty item continues until the correction is made. After the correction is made to Owner's satisfaction, a new warranty period of the same length as the original warranty period shall run on the corrected work. The obligations under this paragraph 12.2.5 shall survive acceptance of the Work under the Contract and termination of the Contract.

12.2.6 NO TIME LIMITATION

Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations which the Contractor might have under the Contract Documents. Establishment of the time period of one (1) year as described in Sections 3.5 and 12.2.5 relates only to the specific warranty obligation of the Contractor to correct the Work after the date of commencement of warranties and has, for example, no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, or to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

12.3 NONCONFORMING WORK AND WITHHOLDING THE VALUE OF IT

If it is found at any time before Completion of the Work that the Contractor has varied from the Contract Documents in materials, quality, form, finish, or in the amount or value of the materials or labor used, the Owner may, in addition to other remedies in the Contract Documents or under

law and as allowed by law, accept the improper Work. The Owner may withhold from any amount due or to become due Contractor that sum of money equivalent to the difference in value between the Work performed and that called for by the Drawings and Specifications. The Owner shall determine such difference in value. No structural related work shall be accepted that is not in conformance with the Contract Documents.

ARTICLE 13

MISCELLANEOUS PROVISIONS

13.1 GOVERNING LAW

The Contract shall be governed by the law of the place where the Project is located.

13.2 SUCCESSORS AND ASSIGNS

The Owner and the Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to the other party hereto and to partners, successors, assigns, and legal representatives of such other party in respect to covenants, agreements, and obligations contained in the Contract Documents. Neither party to the Contract shall assign the Contract as a whole or in part without written consent of the other. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

13.3 WRITTEN NOTICE

In the absence of specific notice requirements in the Contract Documents, written notice shall be deemed to have been duly served if delivered in person to the individual, member of the firm or entity, or to an officer of the corporation for which it was intended, or if delivered at or sent by registered or certified or overnight mail to the last business address known to the party giving notice. Owner shall, at Contractor's cost, timely notify Contractor of Owner's receipt of any third party claims relating to the Contract pursuant to Public Contract Code section 9201.

13.4 RIGHTS AND REMEDIES

13.4.1 DUTIES AND OBLIGATIONS CUMULATIVE

Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

13.4.2 NO WAIVER

No action or failure to act by the Owner, Inspector of Record, Architect or any construction manager shall constitute a waiver of a right or duty afforded them under the Contract Documents, nor shall such action or failure to act constitute approval of or acquiescence in a

breach thereunder, except as may be specifically agreed to in a written amendment to the Contract.

13.5 TESTS AND INSPECTIONS

13.5.1 COMPLIANCE

Tests, inspections, and approvals of portions of the Work required by the Contract Documents will comply with Title 24, and with all other laws, ordinances, rules, regulations, or orders of public authorities having jurisdiction.

13.5.2 INDEPENDENT TESTING LABORATORY

The Owner will select and pay an independent testing laboratory to conduct all tests and inspections, including shipping or transportation costs or expenses (mileage and hours). Selection of the materials required to be tested shall be made by the laboratory and not by the Contractor. However, if Contractor requests that the Owner use a different testing laboratory and Owner chooses to approve such request, Contractor shall reimburse Owner for any additional shipping or transportation costs or expenses (mileage and hours). Owner may invoice such costs or expenses to the Contractor or withhold such costs or expenses from progress payments and/or retention.

13.5.3 ADVANCE NOTICE TO INSPECTOR OF RECORD

The Contractor shall notify the Inspector of Record a sufficient time in advance of its readiness for required observation or inspection so that the Inspector of Record may arrange for same. The Contractor shall notify the Inspector of Record a sufficient time in advance of the manufacture of material to be supplied under the Contract Documents which must, by terms of the Contract Documents, be tested in order that the Inspector of Record may arrange for the testing of the material at the source of supply.

13.5.4 TESTING OFF-SITE

Any material shipped by the Contractor from the source of supply, prior to having satisfactorily passed such testing and inspection or prior to the receipt of notice from said Inspector of Record that such testing and inspection will not be required, shall not be incorporated in the Work.

13.5.5 ADDITIONAL TESTING OR INSPECTION

If the Inspector of Record, the Architect, the Owner, or public authority having jurisdiction determines that portions of the Work require additional testing, inspection, or approval not included under section 13.5.1, the Inspector of Record will, upon written authorization from the Owner, make arrangements for such additional testing, inspection, or approval. The Owner shall bear such costs except as provided in section 13.5.6.

13.5.6 COSTS FOR RETESTING

If such procedures for testing, inspection, or approval under sections 13.5.1, 13.5.2 and 13.5.5 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, the Contractor shall bear all costs arising from such failure, including those of re-testing, re-inspection, or re-approval, including, but not limited to, compensation for the Architect's services and expenses. Any such costs shall be paid by the Owner, invoiced to the Contractor, and, among other remedies, can be withheld from progress payments and/or retention.

13.5.7 COSTS FOR PREMATURE TEST

In the event the Contractor requests any test or inspection for the Project and is not completely ready for the inspection, the Contractor shall be invoiced by the Owner for all costs and expenses resulting from that testing or inspection, including, but not limited to, the Architect's fees and expenses, and the amount of the invoice can among other remedies, be withheld from progress payments and/or retention.

13.5.8 TESTS OR INSPECTIONS NOT TO DELAY WORK

Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

13.6 [INTENTIONALLY LEFT BLANK]

13.7 TRENCH EXCAVATION

13.7.1 TRENCHES GREATER THAN FIVE FEET

Pursuant to Labor Code section 6705, if the Contract Sum exceeds \$25,000 and involves the excavation of any trench or trenches five (5) feet or more in depth, the Contractor shall, in advance of excavation, submit to the Owner or a registered civil or structural engineer employed by the Owner a detailed plan showing the design of shoring for protection from the hazard of caving ground during the excavation of such trench or trenches.

13.7.2 EXCAVATION SAFETY

If such plan varies from the Shoring System Standards established by the Construction Safety Orders, the plan shall be prepared by a registered civil or structural engineer, but in no case shall such plan be less effective than that required by the Construction Safety Orders. No excavation of such trench or trenches shall be commenced until said plan has been accepted by the Owner or by the person to whom authority to accept has been delegated by the Owner.

13.7.3 NO TORT LIABILITY OF OWNER

Pursuant to Labor Code section 6705, nothing in this Article shall impose tort liability upon the

Owner or any of its employees.

13.7.4 NO EXCAVATION WITHOUT PERMITS

The Contractor shall not commence any excavation work until it has secured all necessary permits including the required CAL OSHA excavation/shoring permit. Any permits shall be prominently displayed on the Site prior to the commencement of any excavation.

13.8 WAGE RATES

13.8.1 WAGE RATES

Pursuant to the provisions of Article 2 (commencing at § 1770), Chapter 1, Part 7, Division 2, of the Labor Code, the governing board of the Owner has obtained the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work in the locality in which this public work is to be performed for each craft, classification, or type of worker needed for this Project from the Director of Industrial Relations (“Director”). These rates are on file with the Clerk of the Owner’s Governing Board, and copies will be made available to any interested party on request. The Contractor shall post a copy of such wage rates at the Site.

13.8.2 HOLIDAY AND OVERTIME PAY

Holiday and overtime work, when permitted by law, shall be paid for at a rate of at least one and one-half (1½) times the above specified rate of per diem wages, unless otherwise specified. Holidays shall be defined in the Collective Bargaining Agreement applicable to each particular craft, classification, or type of worker employed.

13.8.3 WAGE RATES NOT AFFECTED BY SUBCONTRACTS

The Contractor shall pay and shall cause to be paid each worker engaged in the Work on the Project not less than the general prevailing rate of per diem wages determined by the Director, regardless of any contractual relationship which may be alleged to exist between the Contractor or any Subcontractor and such workers.

13.8.4 CHANGE IN PREVAILING WAGE DURING BID OR CONSTRUCTION

If during the period this bid is required to remain open, the Director of Industrial Relations determines that there has been a change in any prevailing rate of per diem wages in the locality in which this public work is to be performed, such change shall not alter the wage rates discussed in the Notice to Bidders or the Contract subsequently awarded.

13.8.5 FORFEITURE AND PAYMENTS

Pursuant to Labor Code section 1775, the Contractor and any subcontractor under the Contractor shall as a penalty to the Owner, forfeit not more than Two Hundred Dollars (\$200.00) for each calendar day, or portion thereof, for each worker paid less than the prevailing rate of per diem

wages, determined by the Director, for such craft or classification in which such worker is employed for any public work done under the Agreement by the Contractor or by any Subcontractor under it. Minimum penalties shall apply, as also provided in Civil Code section 1775. The amount of the penalty shall be determined by the Labor Commissioner and shall be based on both of the following: (1) whether the failure of the contractor or subcontractor to pay the correct rate of per diem wages was a good faith mistake and, if so, the error was promptly and voluntarily corrected upon being brought to the attention of the contractor or subcontractor; and (2) whether the contractor or subcontractor has a prior record of failing to meet its prevailing wage obligations. The difference between such prevailing rate of per diem wage and the amount paid to each worker for each calendar day or portion thereof for which each worker was paid less than the prevailing rate of per diem wage shall be paid to each work by the Contractor or subcontractor. Labor Code section 1777.1 shall also apply.

13.8.6 MINIMUM WAGE RATES

Any worker employed to perform Work on the Contract, which Work is not covered by any craft or classification listed in the general prevailing rate of per diem wages determined by the Director, shall be paid not less than the minimum rate of wages specified therein for the craft or classification which most nearly corresponds to the Work to be performed by them, and such minimum wage rate shall be retroactive to time of initial employment of such person in such craft or classification.

13.8.7 PER DIEM WAGES

Pursuant to Labor Code section 1773.1, per diem wages includes employer payments for health and welfare, pension, and vacation pay.

13.8.8 POSTING OF WAGE RATES AND OTHER REQUIRED JOB SITE NOTICES

The Contractor shall post at appropriate conspicuous points on the Site, a schedule showing all determined minimum wage rates and all authorized deductions, if any, from unpaid wages actually earned and all other required job site notices as prescribed by regulation.

13.9 RECORD OF WAGES PAID: INSPECTION

13.9.1 APPLICATION OF LABOR CODE

Pursuant to section 1776 of the Labor Code:

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

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

(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 Owner and the Division of Labor Standards Enforcement of the Department of Industrial Relations ("DIR") and as may be required by the Labor Commissioner under Labor Code section 1771.4). The Contractor and each subcontractor shall furnish a certified copy of all payroll records directly to the Labor Commissioner monthly or more frequently, if so specified in the Agreement and in a format the Labor Commissioner prescribes.

(3) A certified copy of all payroll records enumerated in subdivision (a) shall be made available upon request by the public for inspection or for copies thereof. However, a request by the public shall be made through either the body awarding the contract or the Division of Labor Standards Enforcement of the ... (DIR). 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 the preparation by the contractor, subcontractors, and the entity through which the request was made. The public may not be given access to such records at the principal office of the Contractor.

(c) Unless required as of January 1, 2015, to be furnished directly to the Labor Commissioner under Labor Code section 1771.4(a)(3), the certified payroll records shall be on forms provided by the Division of Labor Standards Enforcement (of the DIR) or shall contain the same information as the forms provided by the division. The payroll records may consist of printouts of payroll data that are maintained as computer records, if the printouts contain the same information as the forms provided by the division and the printouts are verified in the manner specified in (a) above.

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

(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 or the Division of Labor Standards Enforcement (of the DIR) shall be marked or obliterated to prevent disclosure of an individual's name, address and social security number. The name and address of the Contractor awarded the Contract or the subcontractor performing the Contract shall not be marked or obliterated. Any copy of records made available for inspection by, or furnished to, a 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) 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 nonredacted copies of certified payroll records. Any copies of records or certified payroll made available for inspection and furnished upon request to the public by an agency included in the Joint Enforcement Strike Force on the Underground Economy or to a law enforcement agency investigating a violation of law shall be marked or redacted to prevent disclosure of an individual's name, address, and social security number. An employer shall not be liable for damages in a civil action for any reasonable act or omission taken in good faith in compliance with this subsection.

(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 has 10 days in which to comply subsequent to receipt of 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 (\$100.00) for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Labor Standards Enforcement (of the DIR), these penalties shall be withheld from progress payments then due. A contractor is not subject to a penalty assessment pursuant to this section due to the failure of the subcontractor to comply with this section.

13.10 APPRENTICES

13.10.1 APPRENTICE WAGES AND DEFINITIONS

All apprentices employed by the Contractor to perform services under the Contract shall be paid the standard wage paid to apprentices under the regulations of the craft or trade at which he or she is employed, and shall be employed only at the work of the craft or trade to which he or she is registered. Only apprentices, as defined in section 3077 of the Labor Code, who are in training under apprenticeship standards and written apprenticeship agreements under Chapter 4 (commencing with § 3070) of Division 3, are eligible to be employed under this Contract. The employment and training of each apprentice shall be in accordance with the apprenticeship standards and apprentice agreements under which he or she is training. Contractor shall pay apprentices for any preemployment activities, as set forth in Labor Code section 1777.5.

13.10.2 APPRENTICE LABOR POOL

When the Contractor to whom the Contract is awarded by the Owner, or any Subcontractor under him or her, in performing any of the Work under the Contract or subcontract, employs workers in any apprenticeable craft or trade, the Contractor and Subcontractor shall apply to the joint apprenticeship committee administering the apprenticeship standards of the craft or trade in the area of the Site of the Project, for a certificate approving the Contractor or Subcontractor under the apprenticeship standards for the employment and training of apprentices in the area or industry affected. However, approval as established by the joint apprenticeship committee or committees shall be subject to the approval of the Administrator of Apprenticeship. The joint apprenticeship committee or committees, subsequent to approving the subject Contractor or Subcontractor, shall arrange for the dispatch of apprentices to the Contractor or Subcontractor in order to comply with this section. Every Contractor and Subcontractor shall submit the contract award information to the applicable joint apprenticeship committee which shall include an estimate of journeyman hours to be performed under the Contract, the number of apprentices to be employed, and the approximate dates the apprentices will be employed. There shall be an affirmative duty upon the joint apprenticeship committee or committees administering the apprenticeship standards of the crafts or trade in the area of the Site of the public work, to ensure equal employment and affirmative action and apprenticeship for women and minorities. Contractors or Subcontractors shall not be required to submit individual applications for approval to local joint apprenticeship committees provided they are already covered by the local apprenticeship standards. The ratio of work performed by apprentices to journeymen, who shall be employed in the craft or trade on the Project, may be the ratio stipulated in the apprenticeship standards under which the joint apprenticeship committee operates, but, except as otherwise provided in this section, in no case shall the ratio be less than one (1) hour of apprentice work for every five (5) hours of labor performed by a journeyman. However, the minimum ratio for the land surveyor classification shall not be less than one (1) apprentice for each five (5) journeymen.

13.10.3 JOURNEYMAN/APPRENTICE RATIO; COMPUTATION OF HOURS

Any ratio shall apply during any day or portion of a day when any journeyman, or the higher

standard stipulated by the joint apprenticeship committee, is employed at the job Site and shall be computed on the basis of the hours worked during the day by journeymen so employed, except for the land surveyor classification. The Contractor shall employ apprentices for the number of hours computed as above before the end of the Contract. However, the Contractor shall endeavor, to the greatest extent possible, to employ apprentices during the same time period that the journeymen in the same craft or trade are employed at the job Site. Where an hourly apprenticeship ratio is not feasible for a particular craft or trade, the Division of Apprenticeship Standards, upon application of a joint apprenticeship committee, may order a minimum ratio of not less than one (1) apprentice for each five (5) journeymen in a craft or trade classification.

13.10.4 JOURNEYMAN/APPRENTICE RATIO

The Contractor or Subcontractor, if he or she is covered by this section upon the issuance of the approval certificate, or if he or she has been previously approved in the craft or trade, shall employ the number of apprentices or the ratio of apprentices to journeymen stipulated in the apprenticeship standards. Upon proper showing by the Contractor that he or she employs apprentices in the craft or trade in the state on all of his or her contracts on an annual average of not less than one (1) hour of apprentice work for every five (5) hours of labor performed by a journeyman, or in the land surveyor classification, one (1) apprentice for each five (5) journeymen, the Division of Apprenticeship Standards may grant a certificate exempting the Contractor from the 1-to-5 hourly ratio as set forth in this section. This section shall not apply to contracts of general contractors or to contracts of specialty contractors not bidding for work through a general or prime contractor, when the contracts of general contractors or those specialty contractors involve less than Thirty Thousand Dollars (\$30,000) or twenty (20) working days. Any work performed by a journeyman in excess of eight (8) hours per day or forty (40) hours per week, shall not be used to calculate the hourly ratio required by this section.

13.10.4.1 *Apprenticeable Craft or Trade.* “Apprenticeable craft or trade” as used in this Article means a craft or trade determined as an apprenticeable occupation in accordance with the rules and regulations prescribed by the California Apprenticeship Council. The joint apprenticeship committee shall have the discretion to grant a certificate, which shall be subject to the approval of the Administrator of Apprenticeship, exempting a Contractor from the 1-to-5 ratio set forth in this Article when it finds that any one of the following conditions is met:

- A. Unemployment for the previous three-month period in the area exceeds an average of fifteen percent (15%).
- B. The number of apprentices in training in such area exceeds a ratio of 1-to-5.
- C. There is a showing that the apprenticeable craft or trade is replacing at least one-thirtieth (1/30) of its journeymen annually through the apprenticeship training, either on a statewide basis or on a local basis.
- D. Assignment of an apprentice to any work performed under this contract would create a condition which would jeopardize his or her life or the life, safety, or property of fellow employees or the public at large or if the specific task to which

the apprentice is to be assigned is of such a nature that training cannot be provided by a journeyman.

13.10.5 RATIO EXEMPTION

When exemptions are granted to an organization which represents Contractors in a specific trade from the 1-to-5 ratio on a local or statewide basis, the member Contractors will not be required to submit individual applications for approval to local joint apprenticeship committees, if they are already covered by the local apprenticeship standards.

13.10.6 APPRENTICE FUND

A Contractor to whom the Contract is awarded or any Subcontractor under him or her, who, in performing any of the work under the Contract, employs journeymen or apprentices in any apprenticeable craft or trade and who is not contributing to a fund or funds to administer and conduct the apprenticeship program in any such craft or trade in the area of the Site of the Project, to which fund or funds other contractors in the area of the Site of the Project are contributing, shall contribute to the fund or funds in each craft or trade in which he or she employs journeymen or apprentices on the Project in the same amount or upon the same basis and in the same manner as the other contractors do, but where the trust fund administrators are unable to accept the funds, contractors not signatory to the trust agreement shall pay a like amount to the California Apprenticeship Council. The Contractor or Subcontractor may add the amount of the contributions in computing his or her bid for the contract. The Division of Labor Standards Enforcement is authorized to enforce the payment of the contributions to the fund or funds as set forth in the Labor Code section 227.

13.10.7 PRIME CONTRACTOR COMPLIANCE

The responsibility of compliance with section 13.10 and section 1777.5 of the Labor Code for all apprenticeable occupations is with the Prime Contractor.

13.10.8 DECISIONS OF JOINT APPRENTICESHIP COMMITTEE

All decisions of the joint apprenticeship committee under this section 13.10 and Labor Code section 1777.5 are subject to Labor Code section 3081.

13.10.9 NO BIAS

It shall be unlawful for an employer or a labor union to refuse to accept otherwise qualified employees as registered apprentices on any public works on the grounds of race, religious creed, color, national origin, ancestry, sex, or age, except as provided in the Labor Code section 3077.

13.10.10 VIOLATION OF LABOR CODE

Pursuant to Labor Code sections 1777.1 and 1777.7, in the event a Contractor or Subcontractor fails to comply with the provisions of this section 13.10 and Labor Code section 1777.5, among other things:

- (a) If a Contractor or Subcontractor willfully fails to comply, the Labor Commissioner may deny to the contractor or subcontractor, and to its responsible officers, the right to bid on, or be awarded or perform work as a subcontractor on, any public works project for a period of up to one year for the first violation and for a period of up to three years for the second and subsequent violation. Each period of debarment shall run from the date the determination of noncompliance by the Labor Commissioner becomes a final order.
- (b) A contractor or subcontractor who violates section 1777.5 shall forfeit as a civil penalty an amount not exceeding the sum of One Hundred Dollars (\$100) for each full calendar day of noncompliance. Upon receipt of a determination that a civil penalty has been imposed, the awarding body shall enforce the penalty, which includes withholding the amount of the civil penalty from the contract progress payments or retention then due or to become due.
- (c) In lieu of the penalty provided, the Labor Commissioner may for a first time violation and with the concurrence of an applicable apprenticeship program, order the contractor or subcontractor to provide apprentice employment equivalent to the work hours that would have been provided for apprentices during the period of noncompliance.
- (d) Any funds withheld by the awarding body pursuant to this section shall be deposited in the General Fund.
- (e) The interpretation and enforcement of section 1777.5 and this section shall be in accordance with the regulations of the California Apprenticeship Council.

Pursuant to Public Contract Code section 6109, no contractor or subcontractor may bid on, be awarded, or perform work as a subcontractor on a public works project if ineligible to bid or work on, or be awarded, a public works project pursuant to section 1777.1 of the Labor Code.

13.11 ASSIGNMENT OF ANTITRUST CLAIMS

13.11.1 APPLICATION

Pursuant to Public Contract Code section 7103.5 and Government Code section 4552, in entering into a public works contract or a subcontract to supply goods, services, or materials pursuant to a public works contract, the Contractor or Subcontractor offers and agrees to assign to the Owner all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act, (15 U.S.C. § 15) or under the Cartwright Act (Chapter 2 [commencing with § 16700] of Part 2 of Division 7 of the Bus. & Prof. Code), arising from the purchase of goods, services, or materials pursuant to the public works contract or the subcontract. This assignment shall be made and become effective at the time the awarding body tenders Final Progress Payment to the Contractor, without further acknowledgment by the parties. If the Owner receives, either through judgment or settlement, a monetary recovery for a cause of action assigned under Chapter 11 (commencing with § 4550) of Division 5 of Title 1 of the Government Code, the assignor may, upon demand, recover from the Owner any portion of the recovery, including treble damages, attributable to overcharges that were paid by the assignor but were not paid by the Owner as part of the bid price, less the expenses incurred in obtaining that portion of the recovery.

13.11.2 ASSIGNMENT OF CLAIM

Upon demand in writing by the assignor, the Owner shall, within one (1) year from such demand, reassign the cause of action assigned pursuant to this Article if the assignor has been or may have been injured by the violation of law for which the cause of action arose and the Owner has not been injured thereby or the Owner declines to file a court action for the cause of action.

13.12 AUDIT

Pursuant to and in accordance with the provisions of Government Code section 8546.7, or any amendments thereto, all books, records, and files of the Owner, the Contractor, or any Subcontractor connected with the performance of this Contract involving the expenditure of state funds in excess of Ten Thousand Dollars (\$10,000.00), including, but not limited to, the administration thereof, shall be subject to the examination and audit of the Office of the Auditor General of the State of California for a period of three (3) years after release of all retention under this Contract. Contractor shall preserve and cause to be preserved such books, records, and files for the audit period. During the progress of the Work and for three (3) years after release of all retention under the Contract, Owner shall also have the right to an audit of Contractor's books, records, subcontracts, material and equipment contracts, files, and information related to the project, and Contractor must cooperate by producing all requested items within seven (7) days.

13.13 STORM WATER DISCHARGE PERMIT

If applicable, the Contractor shall file a Notice of Intent to comply with the terms of the general permit to discharge storm water associated with construction activity (WQ Order No. 920-08-

DWQ). The Notice of Intent must be sent to the following address along with the appropriate payment (warrant to be furnished by the Owner upon request by the Contractor, allow warrant processing time.): California State Water Resources Control Board, Division of Water Quality, Storm Water Permit Unit, P.O. Box 1977, Sacramento, CA 95812-1977. The Contractor may also call the State Water Board's Construction Activity Storm Water Hotline at (916) 657-1146. The Notice of Intent shall be filed prior to the start of any construction activity.

ARTICLE 14

TERMINATION OR SUSPENSION OF THE CONTRACT

14.1 TERMINATION BY THE CONTRACTOR FOR CAUSE

Contractor may not terminate for convenience. Contractor may only terminate for cause if the Work is stopped by others for a period of one hundred eighty (180) consecutive days through no act or fault of the Contractor, a Subcontractor of any tier, their agents or employees, or any other persons performing portions of the Work for whom the Contractor is contractually responsible, **and** the Work was stopped by others for one of the following reasons: (A) Issuance of an order of a court or other public authority having jurisdiction which requires Owner to stop all Work; or (B) an act of government, such as a declaration of national emergency, making material unavailable which requires Owner to stop all Work. If such grounds exist, the Contractor may serve written notice of such grounds on Owner and demand a meet-and-confer conference to negotiate a resolution in good faith within twenty (20) days of Owner's receipt of such notice. If such conference does not lead to resolution and the grounds for termination still exist, Contractor may terminate the Contract and recover from the Owner payment for Work executed and for reasonable verified costs with respect to materials, equipment, tools, construction equipment, and machinery, including reasonable overhead, profit, and damages for the Work executed, but excluding overhead (field and home office) and profit for (i) Work not performed and (ii) the period of time that the Work was stopped.

14.2 TERMINATION BY THE OWNER FOR CAUSE

14.2.1 GROUNDS FOR TERMINATION

The Owner may terminate the Contract if the Contractor:

- A. Refuses or fails to supply enough properly skilled workers or proper materials, or refuses or fails to take steps to adequately prosecute the Work toward Completion within the Contract Time;
- B. Fails to make payment to Subcontractors for materials or labor in accordance with Public Contract Code section 10262 or Business and Professions Code section 7108.5, as applicable;
- C. Violates Labor Code section 1771.1(a), subject to the provisions of Labor Code section 1771.1(f);

- D. Disregards laws, ordinances, rules, regulations, or orders of a public authority having jurisdiction; or
- E. Otherwise is in breach of the Contract Documents.

14.2.2 NOTIFICATION OF TERMINATION

When any of the above reasons exist, the Owner may, without prejudice to any other rights or remedies of the Owner, give notice to Contractor of the grounds for termination and demand cure of the grounds within seven (7) days (a “Notice of Intent to Terminate”). If Contractor fails to **either** (a) completely cure the grounds for termination within seven (7) days **or** (b) reasonably commence cure of the grounds for termination within seven (7) days and reasonably continue to cure the grounds for termination until such cure is complete, then Owner may terminate the Contract effective immediately upon service of written Notice of Termination and may, subject to any prior rights of Contractor’s surety on the performance bond (“Surety”):

- A. Take possession of the Site and of all material, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- B. Accept assignment of subcontracts pursuant to section 5.4; and
- C. Complete the Work by whatever reasonable method the Owner may deem expedient.

14.2.3 PAYMENTS WITHHELD

If the Owner terminates the Contract for one of the reasons stated in section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is Complete.

14.2.4 PAYMENTS UPON COMPLETION

If the unpaid balance of the Contract Sum exceeds costs of Completing the Work, including compensation for professional services and expenses made necessary thereby, such excess shall be paid to the Contractor. If such costs exceed the unpaid balance, the Contractor shall pay the difference to the Owner. This payment obligation shall survive Completion of the Contract.

14.2.5 INCLUSION OF TERMINATION FOR CONVENIENCE

Any purported termination by Owner for cause under this section 14.2, which is revoked or determined to not have been for cause, shall be deemed to have been a termination for convenience effective as of the same date as the purported termination for cause.

14.3 SUSPENSION OR TERMINATION BY THE OWNER FOR CONVENIENCE

14.3.1 SUSPENSION BY OWNER

The Owner may, without cause, order the Contractor in writing to suspend, delay, or interrupt the Work in whole or in part for such period of time as the Owner may determine.

14.3.1.1 *Adjustments.* An adjustment shall be made for increases in the cost of performance of the Contract, including profit on the increased cost of performance caused by suspension, delay, or interruption. No adjustment shall be made to the extent:

- A. That performance is, was or would have been so suspended, delayed, or interrupted by another cause for which the Contractor is responsible; or
- B. That an equitable adjustment is made or denied under another provision of this Contract.

14.3.1.2 *Adjustments for Fixed Cost.* Adjustments made in the cost of performance may have a mutually agreed fixed or percentage fee.

14.3.2 TERMINATION BY THE OWNER FOR CONVENIENCE

14.3.2.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

14.3.2.2 Upon receipt of written notice from the Owner of such termination for the Owner's convenience, the Contractor shall:

- 1. Cease operations as directed by the Owner in the notice;
- 2. Take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
- 3. Except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

14.3.2.3 In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination.

14.4 NOT A WAIVER

Any suspension or termination by Owner for convenience or cause under this Article 14 shall not act as a waiver of any claims by Owner against Contractor or others for damages based on breach of contract, negligence or other grounds.

14.5 MUTUAL TERMINATION FOR CONVENIENCE

The Contractor and the Owner may mutually agree in writing to terminate this Contract for convenience. The Contractor shall receive payment for all Work performed to the date of termination in accordance with the provisions of Article 9.

14.6 EARLY TERMINATION

Notwithstanding any provision herein to the contrary, if for any fiscal year of this Contract the governing body of the Owner fails to appropriate or allocate funds for future periodic payments under the Contract after exercising reasonable efforts to do so, the Owner may upon thirty (30) days' notice, order work on the Project to cease. The Owner will remain obligated to pay for the work already performed but shall not be obligated to pay the balance remaining unpaid beyond the fiscal period for which funds have been appropriated or allocated and for which the work has not been done.

PART 1 - GENERAL

1.1 SUMMARY

- A. Project consists of construction of the Manzanita Elementary School Modernization, 1240 Manzanita Hills Avenue, Redding, CA 96001, as indicated in Contract Documents. The project scope consists of, but is not limited to:
 - a. Modernization of existing multi-use, classroom and library buildings including window replacement, finish replacement and toilet room upgrades.
 - b. Replacement of existing hvac systems.
 - c. Campus wide fire alarm upgrade.
 - d. Accessibility improvements.

1.2 REQUIREMENTS INCLUDED

- A. This section includes administrative provisions:
 - 1. Work sequence.
 - 2. Work by Owner.
 - 3. Contractor use of premises.
 - 4. Field engineering.
 - 5. Regulatory requirements and reference standards.
 - 6. Owner furnished, Contractor installed products.

1.3 WORK SEQUENCE

- A. Coordinate construction schedule and operations with Owner.
- B. Construct the Work in a manner to provide for public convenience. Do not close off public use of facilities.

1.4 WORK BY OWNER

- A. Kitchen Equipment.
 - 1. Double stacked oven combo, Rational Models 101E and 102E – see mechanical drawings.

1.5 CONTRACTOR USE OF PREMISES

- A. Limit use of premises for Work and construction operations and to allow for work by other contractors.
- B. Coordinate use of premises and access to site under direction of Owner.
- C. Use of school sites:
 - 1. Access to Site: From Manzanita Hills Avenue, Redding, CA 96001.
 - 2. Construction Operations: Limited to areas noted on Drawings and coordinated with Administration.
 - 3. Time Restrictions for Performing Interior and Exterior Work: Per City of Redding.

4. Utility Outages and Shutdown: Approved by school administration. Provide minimum 48 hours notice of proposed shutdowns

1.6 FIELD ENGINEERING

- A. Provide field engineering services; establish lines and levels by use of recognized engineering survey practices.
- B. Locate and protect control and reference points.

1.7 REGULATORY REQUIREMENTS AND REFERENCE STANDARDS

- A. Regulatory Requirements:
 1. Architect has contacted governing authorities and reviewed design requirements of local, state and federal agencies for applicability to Project.
 2. Contractor shall be responsible for contacting governing authorities directly for necessary information and decisions bearing upon performance of Work.
- B. Reference Standards:
 1. For Products specified by association or trade standards, comply with requirements of referenced standard, except when more rigid requirements are specified or are required by applicable codes.
 2. Applicable date of each standard is that in effect as of date on proposal or date on Contract where no proposal is available, except when a specific date is specified.

1.8 OWNER FURNISHED, CONTRACTOR INSTALLED PRODUCTS

- A. Select products are to be furnished and paid for by Owner and installed by Contractor:
 1. Refer to Drawings for kitchen equipment being procured by owner and installed by contractor.
- B. Owner's Responsibilities:
 1. Arrange for and deliver shop drawings, product data, and samples to Contractor.
 2. Arrange and pay for product delivery to site.
 3. Inspect products jointly with Contractor on delivery.
 4. Submit claims for transportation damage.
 5. Arrange for replacement of damaged, defective, or missing items.
 6. Arrange for manufacturer's warranties, inspections, and service.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Documentation of Change in Contract Sum/Price and Contract Time.
- B. Change Procedures.
- C. Stipulated Price Change Order.
- D. Unit Price Change Order.
- E. Time and Material Change Order.
- F. Execution of Change Orders.
- G. DSA Approval of Changes – Addenda, Substitutions, and Construction Change Documents (CCD)
- H. Change Order Breakdown / Markup

1.2 DOCUMENTATION OF CHANGE IN CONTRACT SUM/PRICE AND CONTRACT TIME

- A. Maintain detailed records of work done on a time and material basis. 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. On request, 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.
- D. Support each claim for additional costs, and for work done on a time and material basis, with additional information:
 - 1. Origin and date of claim.
 - 2. Dates and times work was performed, and by whom.
 - 3. Time records and wage rates paid.
 - 4. Invoices and receipts for products, equipment, and subcontracts, similarly documented.

1.3 CHANGE PROCEDURES

- A. The Architect will advise of minor changes in the Work not involving an adjustment to Contract Sum/Price or Contract Time as authorized by AIA A201 by issuing supplemental instructions on AIA Form G710.
- B. The Architect may issue a Change Order Request which includes a detailed description of a proposed change with supplementary or revised Drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. Contractor will prepare and submit an estimate.

**SECTION 01 26 00
CONTRACT MODIFICATION PROCEDURES**

- C. The Contractor may propose a change by submitting a request for change to the Architect, describing the proposed change and its full effect on the Work, with a statement describing the reason for the change, and the effect on the Contract Sum/Price and Contract Time with full documentation and a statement describing the effect on Work by separate or other contractors. Document any requested substitutions in accordance with Section 01 62 00.

1.4 STIPULATED SUM PRICE CHANGE ORDER

- A. Based on Change Order Request and Contractor's fixed price quotation or Contractor's request for a Change Order as approved by Architect.

1.5 UNIT PRICE CHANGE ORDER

- A. For pre determined unit prices and quantities; the Change Order will be executed on a fixed unit price basis.
- B. For unit costs or quantities of units of work that are not pre determined, execute Work under a Construction Change Authorization.
- C. Changes in Contract Sum/Price or Contract Time will be computed as specified for Time and Material Change Order.

1.6 TIME AND MATERIAL CHANGE ORDER

- A. Submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract.
- B. Architect will determine the change allowable in Contract Sum/Price and Contract Time as provided in the Contract Documents.
- C. Maintain detailed records of work done on Time and Material basis.
- D. Provide full information required for evaluation of proposed changes, and to substantiate costs for changes in the Work.

1.7 EXECUTION OF CHANGE ORDERS

- A. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.
- B. All Change Orders shall be approved by the Owner, Architect, Contractor.

1.8 DSA APPROVAL OF CHANGES -

A. ADDENDA

Prior to start of construction, any supplemental documents that change or affect the Structural, Access or Fire & Life Safety portions of the project construction documents shall be approved by the Division of the State Architect as addenda.

B. SUBSTITUTIONS

Any substitutions that change or affect the Structural, Access or Fire & Life Safety portions of the project construction documents shall be approved by DSA.

C. CONSTRUCTION CHANGE DOCUMENTS (DSA Form 140)

Any changes to the approved construction documents during construction shall be made by means of Construction Change Documents (CCD). CCDs shall be prepared by the Architect/Engineer.

1. Changes to or affecting the Structural, Access or Fire & Life Safety portions of the project:
 - a. These changes will be classified as CCD Category A and are required to be submitted to and approved by DSA prior to the commencement of the affected work.
 - b. CCD Category A will be submitted to DSA using the CCD Category A form, DSA-140.
2. Changes not affecting the Structural Safety, Access Compliance or Fire & Life Safety portions of the project:
 - a. These changes will be classified as CCD Category B.
 - b. CCD Category B changes are not required to be submitted to DSA unless specifically required in writing, by DSA.
 - c. If DSA requires any CCD Category B to be submitted then they shall be submitted to DSA using form DSA-140.
 - d. The initial determination of change Category will be made by the Architect/Engineer and the Inspector. If DSA requires a Category B CCD to be submitted then DSA will review for concurrence that it does not contain changes to, or affect the Structural, Access or Fire & Life Safety portions of the project. If necessary, and at its sole discretion, DSA will re-assign the CCD to Category A.

1.9 CHANGE ORDER BREAKDOWN/MARKUPS

- A. The Contractor's written response to all change order requests (CORs) shall be formatted with an itemized breakdown of all increases or decreases in the cost of the Contractor's and all Subcontractor's work, in at least the following detail:
 1. Material quantities and unit cost.
 2. Labor costs (identified with specific item of material to be placed or operation to be performed).
 3. Construction equipment.
 4. Workmen's Compensation and Public Liability Insurance.
 5. Overhead.
 6. Profit.
 7. Taxes.
- B. The mark-up on work subcontracted by a Subcontractor will be limited to one overhead percentage and one profit percentage in addition to the Prime Contractor's coordination percentage. On proposals covering both increases and decreases in the amount of the contract, the overhead, profit and, where applicable, coordination amount, will be computed on the net change only. On proposals for decreases in the amount of the contract the overhead, profit, and where applicable, coordination will be part of the decrease in direct cost.

**SECTION 01 26 00
CONTRACT MODIFICATION PROCEDURES**

1. Change Orders of \$0 - \$5,000:

	<u>OVERHEAD</u>	<u>PROFIT</u>	<u>COORDINATION</u>
To Contractor on work performed by other than his own forces -	--	--	15%
To Contractor and/or the subcontractors for that portion of the work performed with their respective forces -	15%	5%	--

2. Change Orders of \$5,001- \$30,000:

	<u>OVERHEAD</u>	<u>PROFIT</u>	<u>COORDINATION</u>
To Contractor on work performed by other than his own forces -	--	--	13%
To Contractor and/or the subcontractors for that portion of the work performed with their respective forces -	12%	5%	--

3. Change Orders of \$30,001 or more:

	<u>OVERHEAD</u>	<u>PROFIT</u>	<u>COORDINATION</u>
To Contractor on work performed by other than his own forces -	--	--	10%
To Contractor and/or the subcontractors for that portion of the work performed with their respective forces -	10%	5%	--

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section covers general requirements for Contractor's Requests for Interpretation (RFIs).

1.2 CONTRACTORS REQUESTS FOR INTERPRETATION

- A. Submit a Request for Interpretation to the Architect when:
 - 1. An unforeseen condition or constructability question occurs.
 - 2. Questions regarding information in the Contract Documents arise.
 - 3. Information not found in the Contract Documents is required.
- B. When possible, request such clarification in writing at the next scheduled Project meeting. When the RFI is answered at the Project meeting, number the RFI and enter the response into the meeting minutes.
 - 1. When the urgency of the need, or the complexity of the item makes clarification at the next scheduled Project meeting impractical, prepare and submit a formal written RFI to the Architect without delay.
- C. Submit RFIs within a reasonable time frame so as not to interfere with or impede the progress of the work. Keep the number of RFIs to a minimum. When the number and frequency of RFIs submitted becomes unwieldy, the Architect may require the Contractor to abandon the process and submit requests as either submittals, substitutions, or requests for change.
 - 1. When an answer to an RFI has an effect on cost or time, notify the Architect and Owner in accordance with the Contract Documents at the time of submittal. Notification shall occur prior to commencing such work, so that the change order process can be initiated.
 - 2. At the time of submitting an RFI, alert the Architect to the time available before the response will cause an impact to the Project.
- D. Submit the RFI through Alliance2Build ® Project Collaboration System:
 - 1. Submit an electronic Request for Interpretation by logging into Alliance system and selecting the link "Submit RFI" on the Project Home Page. The next consecutive number will be assigned automatically. Fill in the text boxes with the following information:
 - a. Reference such as Drawing numbers, Detail references or specification numbers, as appropriate.
 - b. Subject of RFI in a concise form describing the nature of the problem
 - c. Importance factor with four available options: Urgent, High, Medium and Low
 - d. Clear, concise explanation of information or clarification requested.
 - e. Contractor's Suggested Resolution for the described request, if appropriate.
 - f. Attach files, drawing references, sketches, images, any types of electronic information that pertain to the request.
- E. Allow a minimum of 5 working days for review and response time; the response time will be increased if inadequate information is provided, when the RFI is submitted out-of-sequence, or if in the opinion of the Architect, more time is needed to answer the RFI.

1.3 QUALITY ASSURANCE

- A. Carefully study the Contract Documents to assure that the requested information is not available therein. RFIs requesting information available in the Contract Documents may not be answered by the Architect.
- B. In all cases where an RFI is issued to request clarification of coordination issues, for example, pipe and duct routing, clearances, specific locations of work shown diagrammatically, and similar

SECTION 01 26 13
REQUESTS FOR INTERPRETATION

items, the Contractor shall fully lay-out a suggested solution using drawings or sketches drawing to scale and submit same with the RFI. An RFI which fails to include a suggested solution will not be answered.

- C. Do not use RFI for the following purposes:
 - 1. To request approval of submittals.
 - 2. To request approval of substitutions.
 - 3. To request changes to the Contract Documents to confirm action taken by the Contractor for requested changes/substitutions to the Contract Documents.

- D. If the Contractor believes that a clarification by the Architect may result in a change in Contract price, the contractor shall not proceed with the work indicated by the RFI until a change order or other acceptable tracking device is prepared and approved by the Owner.
 - 1. If the Contractor believes that a clarification by the Architect results in additional cost, the Contractor shall identify in the RFI the basis of the Contractor's bid as it relates to the RFI.
 - 2. Answered RFIs shall not be construed as an approval to perform extra work.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Procedures for preparation and submittal of Applications for Payment

1.2 SCHEDULE OF VALUES

- A. Submit typed schedule on AIA Form G703 or another Owner and Architect pre-approved 8-1/2" by 11" paper format; Contractor's standard media-driven printout will be considered on request. Submit within 15 days after award of Contract.
- B. Format: Table of Contents of this Project Manual, with modifications as pre-approved by Owner and Architect; identify each line item with number and title of major Specification sections.
- C. Include in each line item a directly proportional amount of Contractor overhead and profit.
- D. Revise schedule to list change orders for each Application for Payment.

1.3 FORMAT

- A. AIA G702 Application and Certificate for Payment: Application for Payment including continuation sheets when required.
- B. For each item, provide a column for listing: Item Number; Description of work; Scheduled Value, Previous Applications: Work in Place and Stored Materials under this Application: Authorized Change Orders; Total Completed and Stored to Date of Application; Percentage of Completion; Balance to Finish; and Retainage.
- C. Prior to submitting the first application for payment submit a schedule of values, per paragraph 1.2 of this section.
- D. Provide spaces for signatures of the following:
 - 1. Contractor
 - 2. Architect
 - 3. Project Inspector
 - 4. Owner

1.4 PREPARATION OF APPLICATIONS

- A. Present required information in typewritten form.
- B. Execute certification by signature of authorized officer.
- C. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored products.
- D. List each authorized Change Order as an extension on continuation sheet, listing Change Order number and dollar amount as for an original item of Work.
- E. Certificates for payment as recommended by the Architect or the Owner shall include a 10% retention that will be held by the Owner until such a time as outlined in Section 01 77 00.

**SECTION 01 29 00
PAYMENT PROCEDURES**

F. Prepare Application for Final Payment as specified in Section 01 77 00.

1.5 PAYMENT APPLICATION SUBMITTAL PROCEDURES

- A. Review Pay Application with Project Inspector prior to submitting to Architect.
- B. Submit three copies of each Application for Payment or submit through Alliance2Build .
- C. Submit an updated construction schedule with each Application for Payment.
- D. Payment Period: Monthly.

1.6 SUBSTANTIATING DATA

- A. When Architect/Engineer requires substantiating information, submit data justifying dollar amounts in question.
- B. Provide one copy of data with cover letter for each copy of submittal. Show Application number and date, and line item by number and description.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Coordination.
- B. Cutting and patching.
- C. Preconstruction conference.
- D. Site mobilization conference.
- E. Progress meetings.
- F. Preinstallation conferences.

1.2 COORDINATION

- A. Coordinate scheduling, submittals, and Work of the various Sections of specifications to assure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- B. Verify that 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.
- C. Coordinate space requirements 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 line of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
 - 1. Priority of right of way in attic and other interstitial spaces shall be as follows:
 - a. First Priority: Electrical lights, electrical panels and sloped drain piping.
 - b. Second Priority: Ductwork.
 - c. Third Priority: Fire protection piping, domestic hot water, domestic cold water and condenser water piping.
 - d. Other.
 - 2. Multiple trade coordination of the following systems shall be completed electronically using three dimensional modeling software. Design team may make AutoCAD or Revit background file(s) of the floor plan(s) available at time of award of contract. The backgrounds provided shall be used as references in the contractor's files so that the backgrounds may be updated at the Architects discretion. These coordination drawings shall include system component locations referenced vertically and horizontally to adjacent column grids and finished floor / ceiling elevations for the following systems:
 - a. Supply, return and exhaust air systems
 - b. Access to balancing devices
 - c. Steam and condensate return piping (including slope data)
 - d. Supply and return heating hot water
 - e. Domestic hot and cold water
 - f. Sanitary sewer and vent
 - g. Documented interface with existing storm drain system
 - h. Access to all equipment requiring service
 - i. Access to all isolation valves
 - j. Location of piping system labeling per specifications

SECTION 01 31 00
PROJECT MANAGEMENT COORDINATION

- k. Fire Protection and fire sprinkler system piping
 - l. Primary electrical conduits
 - m. Specialty equipment with specialty support requirements
 - n. Light fixtures and their depths at locations of potential conflict.
- 3. Coordinated shop drawing reflecting the multiple trade coordination shall be prepared with any minor modifications documented and submitted as a record document per Section 01 77 00. Provide electronic files to the Architect of all system coordination drawing record document files with the record documents.
 - 4. The Contractor is responsible for translating the data coming to and from the format provided by the Architect without loss of data integrity. Architect will only receive data in the AutoCAD or Revit format in which the background(s) are provided.
- D. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
 - E. Coordinate completion and clean up of Work of separate Sections in preparation for Substantial Completion.
 - F. 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.

1.4 CUTTING AND PATCHING

- A. Employ skilled and experienced installer to perform cutting and patching.
- B. Submit written request in advance of cutting or altering elements which affects:
 - 1. Structural integrity of element.
 - 2. Integrity of weather-exposed or moisture-resistant elements.
 - 3. Efficiency, maintenance, or safety of element.
 - 4. Visual qualities of sight-exposed elements.
 - 5. Work of Owner or separate contractor.
- C. Execute cutting, fitting, and patching including excavation and fill, to complete Work, and to:
 - 1. Fit the several parts together, to integrate with other Work.
 - 2. Uncover Work to install or correct ill-timed Work.
 - 3. Remove and replace defective and non-conforming Work.
 - 4. Remove samples of installed Work for testing.
 - 5. Provide openings in elements of Work for penetrations of mechanical and electrical Work.
- D. Execute work by methods which will avoid damage to other Work, and provide proper surfaces to receive patching and finishing.
- E. Cut rigid materials using masonry saw or core drill.
- F. Restore Work with new products in accordance with requirements of Contract Documents.
- G. Fit Work tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- H. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.
- I. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for an assembly, refinish entire unit.

**SECTION 01 31 00
PROJECT MANAGEMENT COORDINATION**

- J. Identify any hazardous substance or condition exposed during the Work to the Architect/Engineer for decision or remedy.

1.5 PRECONSTRUCTION CONFERENCE

- A. Architect will schedule a conference after Notice of Award.
- B. Attendance Required: Owner, Architect, Project Inspector and Contractor's Superintendent and major subcontractors.
- 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 submittals, substitutions, applications for payments, proposal request, Requests for Interpretation, Change Orders, record documents and Contract closeout procedures.
 - 7. Submission of Construction Schedule.
 - 8. Scheduling activities of inspector and geotechnical Engineer.
 - 9. Use of premises by Owner and Contractor.
 - 10. Owner's requirements and any partial occupancy requirements.
 - 11. Construction facilities and controls provided by Owner.
 - 12. Temporary utilities provided by Owner.
 - 13. Survey and building layout.
 - 14. Security and housekeeping procedures.
 - 15. Procedures for testing.
 - 16. DSA-required notices

1.6 PROGRESS MEETINGS

- A. Coordinate with Architect to schedule and administer meetings throughout progress of the Work at maximum monthly intervals.
- B. Architect will prepare agenda with copies for participants, preside at meetings, record minutes, and distribute copies within seven days to Contractor, Owner, participants, and those affected by decisions made.
- C. Attendance Required: Job superintendent, major Subcontractors and suppliers, Owner, Architect, as appropriate to agenda topics for each meeting.
- D. Agenda:
 - 1. Review minutes of previous meetings.
 - 2. Review of Work progress.
 - 3. Field observations, problems, and decisions.
 - 4. Identification of problems which impede planned progress.
 - 5. Review of submittals schedule and status of submittals.
 - 6. Review of off-site fabrication and delivery schedules.
 - 7. Maintenance of progress schedule.
 - 8. Corrective measures to regain projected schedules.
 - 9. Planned progress during succeeding work period.
 - 10. Coordination of projected progress.
 - 11. Maintenance of quality and work standards.
 - 12. Effect of proposed changes on progress schedule and coordination.

SECTION 01 31 00
PROJECT MANAGEMENT COORDINATION

13. Other business relating to Work.
14. Inspection and acceptance of any equipment put into service during construction period.

1.7 PREINSTALLATION CONFERENCES

- A. When required in individual specification Section, convene a preinstallation conference at 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 seven days in advance of meeting date.
- D. Prepare agenda, preside at conference, record minutes, and distribute copies within seven days after conference to participants, with seven copies to Architect/Engineer.
- E. Review conditions of installation, preparation and installation procedures, and coordination with related work.

PART 2 PRODUCTS

\\Not Used

PART 3 EXECUTION

\\Not Used

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Construction Progress Documentation

1.2 CONSTRUCTION PROGRESS SCHEDULE

A. Submit initial progress schedule in duplicate within 15 days after date established in Notice to Proceed for Architect review.

1. First payment request will not be processed until construction schedule is received.

B. Revise and resubmit as required by Architect.

C. Submit revised schedules with each Application for Payment, identifying changes since previous version.

D. Submit a horizontal bar chart with separate line for each major section of Work or operation, identifying first work day of each week.

E. Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Indicate the early and late start, early and late finish, float dates, and duration.

F. Indicate estimated percentage of completion for each item of Work at each submission.

G. Indicate submittal dates required for shop drawings, product data, samples, and product delivery dates, including those furnished by Owner and under Allowances.

PART 2 PRODUCTS

\\Not Used

PART 3 EXECUTION

\\Not Used

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. General Submittal Procedures
 - 2. Electronic Submittal Procedures
 - 3. Physical Submittal Procedure
 - 4. Contractor Responsibilities
 - 5. Product Data
 - 6. Shop Drawings
 - 7. Samples
 - 8. Manufacturer's Instructions
 - 9. Manufacturers' certificates.
 - 10. Agency deferred approvals.

1.2 DESCRIPTION

- A. Types of Submittals: Submittal procedures specified in this section include construction progress schedules, shop drawings, product data, samples, manufacturers' certificates, manufacturer's installation instructions, and agency deferred approvals.
- B. Intent: Architect's review of shop drawings is intended to be a preview of what the Contractor intends to provide, and will function as an effort to foresee unacceptable materials or assemblies and to avoid the possibility of their rejection at the Project Site. Architect will review submittals only for conformance with the design concept of the Project and with the information given in the Contract Documents.
- C. The Architect's review of shop drawings will be general and shall not be construed:
 - 1. As permitting departure from the Contract requirements except as otherwise provided for under "substitution" provisions of Section 01 62 00;
 - 2. As relieving Contractor of responsibility for omissions or errors, including details, dimensions, materials, etc.;
 - 3. That review of a separate item indicates acceptance of an assembly in which the item functions. Architect will only review acceptance of an assembly in which the item functions. Architect will only review submittals required by Contract Documents for conformance with design concept of the Project and with the information given in the Contract Documents.

1.3 GENERAL SUBMITTAL PROCEDURES

- A. All submittals shall be made electronically through the Alliance2Build. Only Samples for verification should be submitted physically.
- B. Transmit each Sample submittal with AIA Form G810 or other Architect-accepted form.
- C. Sequentially number the submittals and transmittal forms as shown in each section requiring submittals with the project manual section number from which the submittal is being requested followed by the alphabetic suffix. (I.E. 01 33 00A) Resubmittals are to have original number

**SECTION 01 33 00
SUBMITTAL PROCEDURES**

followed by an underscore and an additional numerical suffix beginning with '1' and then consecutively thereafter with each resubmittal. (I.E. 01 33 00A_1)

- D. Identify Project, Contractor, Subcontractor or supplier; pertinent Drawing sheet and detail number(s), and specification Section number, as appropriate.
- E. Apply Contractor's stamp and signature or initial (electronically or physically) certifying that review, verification of Products required, field dimensions, adjacent construction Work, and coordination of information, is in accordance with the requirements of the Work and Contract Documents.
- F. Unless otherwise authorized by the Architect, all of the submittals required by a specification section shall be submitted together at the same time. Electronic submittals of product data, shop drawings, etc. may be submitted ahead of physical color samples with approval of the Architect. Submittals that do not include all required submittals for a given specification section will be returned without review.
- G. Schedule submittals to expedite the Project. **Late submittals shall not be considered a valid reason for product substitution.** Deliver Samples to architect at business address. Coordinate submission of related items.
- H. Identify variations from Contract Documents and Product or system limitations that may be detrimental to successful performance of the completed Work.
- I. Substitutions must be submitted according to Section 01 62 00. Substitutions submitted without following this procedure will be rejected.
- J. Provide space for Contractor and Architect review stamps.
- K. Revise and resubmit submittals as required, identify all changes made since previous submittal.
- L. Distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions.

1.4 ELECTRONIC SUBMITTAL PROCEDURES

- A. All submittals shall be submitted electronically.
- B. Submittals shall be uploaded to Alliance System in full size PDF format. Do not reduce Shop Drawings from original sheet size.
- C. One PDF copy of electronic submittals will be returned to the Contractor. Contractor may distribute submittals to the concerned parties electronically or physically. Any printing costs for physical distribution of submittals shall be borne by the Contractor. The Architect will not print copies for distribution.
- D. Follow all General Submittal Procedures as described above.

1.5 PHYSICAL SUBMITTAL PROCEDURES

- A. Samples and Color Charts shall be physical submittals with accurate representation of color and other physical characteristics.
- B. Submit a minimum of two (2) copies of each submittal including samples and resubmittals, as the Architect will retain a one.
- C. Follow all General Submittal Procedures as described above.

1.6 CONTRACTOR RESPONSIBILITIES

- A. Review shop drawings, product data and samples prior to submission.
- B. Determine and verify:
 - 1. Field measurements.
 - 2. Field construction criteria.
 - 3. Catalog numbers and similar data.
 - 4. Conformance with specifications.
 - 5. Conformance with applicable codes.
- C. Submittals giving inadequate indication of contractor review and approval will be returned without review, for resubmission.
- D. Coordinate each submittal with requirements of the Work and of the Contract Documents.
- E. Notify the Architect in writing, at time of submission, of any deviations in the submittals from requirements of the Contract Documents.
- F. Begin no fabrication or construction activity that requires submittals until return of submittals with Architect's stamp and initials or signature indicating finish review.
- G. After Architect's final review, distribute copies.

1.7 PRODUCT DATA

- A. Submit all product data electronically.
- B. Mark the submittal to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information unique to this Project.
- C. After review, distribute in accordance with Submittal Procedures and provide copies for Record Documents as described in Section 01 77 00.
- D. Show dimensions and clearances required.

1.8 SHOPDRAWINGS

- A. Submit all shop drawings electronically.
- B. After review and distribution in accordance with Submittal Procedures, retain one copy of all reviewed shop drawings at the job and label them "PROJECT RECORD" as described in Section 01 77 00 Execution and Close-out Requirements.

1.9 SAMPLES

- A. Submit samples to illustrate functional and aesthetic characteristics of the Product, with integral parts and attachment devices. Provide units identical with final condition of proposed materials or products for the work. Coordinate sample submittals for interfacing work.
- B. Submit samples of finishes from the full range of manufacturers' standard colors textures, and patterns for Architect's selection.
- C. Include identification on each sample, with full Project information.
- D. Submit the number or samples specified in individual specification Sections; one of which will be retained by Architect.

**SECTION 01 33 00
SUBMITTAL PROCEDURES**

- E. Reviewed samples which may be used in the Work are indicated in individual specification Sections.

1.10 MANUFACTURER'S INSTRUCTIONS

- A. When specified in individual specification Sections, submit manufacturers' printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, in quantities specified for Product Data.
- B. Identify conflicts between manufacturers' instructions and Contract Documents.

1.11 MANUFACTURER'S CERTIFICATES


- A. When specified in individual specification Sections, submit manufacturers' certificate to Architect for review, in quantities specified for Product Data.
- B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference date, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or Product, but must be acceptable to Architect.

1.12 ACTION ON SUBMITTALS

- A. Architect's Action: Architect will review each submittal, mark with "Action" and where possible, return within a reasonable period of time from date of receipt. Where submittal must be held for coordination, Contractor will be so advised without delay. Action markings shall be interpreted as follows:
 - 1. No Exceptions Noted (NEN): Work may proceed, provided it complies with Contract Documents.
 - 2. Furnish As Corrected (FAC): Work may proceed, provided it complies with notations and corrections indicated on submittal and with Contract Documents.
 - 3. Revise and Resubmit (RES): Do not proceed with work. Revise submittal in accordance with notations thereon, and resubmit without delay to obtain a different action marking.
 - 4. Submit Additional Material (SAM): Do not proceed with work. Resubmit submittal with additional material as requested without delay to obtain a different action marking.
 - 5. REjected (REJ): Do not proceed with work. Revise submittal in accordance with notations thereon, and resubmit without delay to obtain a different action marking.
 - 6. See Summary Sheet (SSS): Refer to summary sheet attached to submittal for direction.
 - 7. Reviewed By Consultant (RBC): Submittal has been reviewed by the Architect's consultant. Refer to consultant submittal stamp for direction.

**SECTION 01 33 00
SUBMITTAL PROCEDURES**

B. Sample Architect's Action Stamp:

Submittal Number: _____	
<input type="checkbox"/> No Exceptions Noted	<input type="checkbox"/> REjected
<input type="checkbox"/> Furnish As Corrected	<input type="checkbox"/> See Summary Sheet
<input type="checkbox"/> Revise And Resubmit	<input type="checkbox"/> Reviewed By Consultant
<input type="checkbox"/> Submit Additional Material	
<p>Notes and/or comments made on shop drawings during this review do not relieve Contractor from compliance with requirements of the Contract Documents. This review has been performed by the Architect to check general conformance with the design concept of the project and general compliance with the information in the Contract Documents. Review of a specific item shall not include review of an assembly of which said item is a component. Contractor is responsible for confirming and correlating quantities and dimensions; selecting fabrication processes and construction techniques; coordinating his/her work with that of other trades and performing his/her work in a safe and satisfactory manner. This review shall not be interpreted as an approval of Contractor's means and methods of construction.</p>	
<p>NICHOLS, MELBURG & ROSSETTO 300 Knollcrest Drive Redding, CA 96002</p>	
 By _____	Date: _____

PART 2 - PART 2 PRODUCTS (NOT USED)

PART 3 - PART 3 EXECUTION (NOT USED)

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. This section describes general quality control requirements.
 - 1. General quality control.
 - 2. Manufacturers' field services.
 - 3. Mock-ups.
 - 4. Independent testing laboratory services.
 - 5. Inspection Services.

1.2 QUALITY CONTROL, GENERAL

- A. Maintain quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.
- B. Comply fully with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- D. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

1.3 MANUFACTURER'S FIELD SERVICES

- A. When specified in respective Specification sections, require manufacturer or supplier to have qualified personnel provide on-site observations and recommendations.
 - 1. Observe field conditions, including conditions of surfaces and installation.
 - 2. Observe quality of workmanship.
 - 3. Provide recommendations to assure acceptable installation and workmanship.
 - 4. Where required, start, test, and adjust equipment as applicable.
- B. Representative shall submit written report to Architect or Owner listing observations and recommendations.

1.4 MOCK-UPS

- A. Erect field samples and field mock-ups at locations on site as approved in advance and in accordance with requirements where included in Specifications section.
 - 1. Test mock-ups requiring special equipment may be erected at location having access to necessary equipment; coordinate with Architect.
- B. Field samples and mock-ups not approved and not capable of being acceptably revised shall be removed from site.
- C. Approved field samples and mock-ups may be used as part of Project.

1.5 INDEPENDENT TESTING LABORATORY SERVICES

- A. Owner will employ and pay for services of a DSA approved independent testing laboratory to perform inspections, tests, and other services required by applicable codes and various Specification sections.
 - 1. Owner or Architect may also require independent testing of items where doubts exists that product or system conforms to Contract Documents.
 - a. Contractor shall employ and pay for testing laboratory under above circumstances.
- B. Services shall be performed in accordance with requirements of governing authorities and with specified standards.
- C. Reports will be submitted to Owner and Architect in duplicate giving observations and results of tests, indicating compliance or non-compliance with specified standards and with Contract Documents.
 - 1. Where required, testing laboratory will submit copy of test results directly to enforcing agency.
- D. Contractor shall cooperate with testing laboratory personnel; furnish tools, samples of materials, design mix, equipment, storage and assistance as requested.
 - 1. Notify Owner, Architect and testing laboratory sufficiently in advance of expected time for operations requiring testing services.

1.6 INSPECTION SERVICES

- A. Owner will employ and pay for services of a DSA certified project inspector, approved by the Division of the State Architect, to provide continuous, full time inspection of the project per Section 4-333. The duties of the inspector are defined in Section 4-342, California Building Standards Administrative Code (Part 1, Title 24, CCR).
 - 1. Notify Architect and Inspector 48 hours prior to expected time for operations requiring specific inspection.
 - 2. Make arrangements with independent firm and pay for additional samples and tests required for Contractor's use.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

PART 1- GENERAL

1.1 SUMMARY

- A. Definitions.
- B. Schedule of references.
- C. Schedule of governing codes.

1.2 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "approved," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.3 QUALITY ASSURANCE

- A. For products or workmanship specified by association, trade, or Federal 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 unless specifically noted.
- C. Obtain copies of standards when required by Contract Documents directly from publication source.

**SECTION 01 42 00
REFERENCE STANDARDS**

- D. Maintain copy at jobsite during submittals, planning, and progress of the specific work, until Substantial Completion.
- E. Should specified reference standards conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- F. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.
- G. Schedule of references is general in nature; disregard any reference standard listed that is not applicable to this project.

1.4 STANDARDS AND REGULATIONS

- A. Abbreviations and Acronyms for Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list.

- 1. ADA Americans with Disabilities Act (ADA)
- 2. ABA Architectural Barriers Act (ABA)
- 3. CFR Code of Federal Regulations
- 4. CRD Handbook for Concrete and Cement
- 5. DOD Department of Defense Military Specifications and Standards
- 6. DSCC Defense Supply Center Columbus (See FS)
- 7. FED-STD Federal Standard (See FS)
- 8. FS Federal Specification
- 9. FTMS Federal Test Method Standard (See FS)
- 10. ICC-ES ICC Evaluation Service, Inc.
- 11. MIL (See MILSPEC)
- 12. MIL-STD (See MILSPEC)
- 13. MILSPEC Military Specification and Standards
- 14. NES National Evaluation Service (See ICC-ES)
- 15. UFAS Uniform Federal Accessibility Standards

- B. Schedule of Governing Codes:

- 1. California Code of Regulations (C.C.R.)
 - a. C.C.R. - Title 24, Part 1 – 2016 Building Standards Administrative Code.

SECTION 01 42 00
REFERENCE STANDARDS

- b. 2016 CBC: 2015 IBC as Amended by 2016 California Amendments – C.C.R., Title 24, Parts 1 & 2
 - c. 2016 CEC: 2014 NEC as Amended by California 2016 Amendments - Part 3, Title 24, CCR
 - d. 2016 CMC: 2015 UMC as Amended by California 2016 Amendments - Part 4, Title 24, CCR
 - e. 2016 CPC: 2015 UPC as Amended by California 2016 Amendments - Part 5, Title 24, CCR
 - f. C.C.R. - Title 24, Part 6 - 2016 California Energy Standards
 - g. 2016 CFC: 2015 IFC as Amended by California 2016 Amendments, Part 9 - Title 24, CCR.
 - h. C.C.R. – Title 24, Part 11, 2016 California Green Building Standards Code
 - i. C.C.R. - Title 24, Part 12, 2016 California Referenced Standards Code
 - j. C.C.R. – Title 19
 - k. C.C.R. – Title 22, Social Security, latest register.
- 2. NFPA 101 - Life Safety Code.
 - 3. NFPA 72 – National Fire Alarm Code (California Amended) 2016 Edition.
 - 4. American Disability Act (ADA) or American Disability Act 2010 Standards
 - 5. Standard Specifications for Public Works Constructions.

1.5 SCHEDULE OF REFERENCES

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities listed in the 2016 California Building Code Title 24, Part 2, Chapter 35.

1.6 JOB-SITE PUBLICATIONS

- A. Contractor shall keep a copy of Title 24, Parts 1 through 5, at the jobsite at all times.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

- 3.1 All work shall be done in accordance with the codes referenced in Section 1.4.B Schedule of Governing Codes, and as required by all agencies having jurisdiction.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

- A. Selection and payment.
- B. Quality Assurance.
- C. Laboratory responsibilities.
- D. Laboratory reports.
- E. Limits on testing laboratory authority.
- F. Contractor responsibilities.
- G. Additional Tests.
- H. Schedule of inspections and tests.

1.2 REFERENCES

- A. ANSI/ASTM D3740 - Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
- B. ANSI/ASTM E329 - Recommended Practice for Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction.

1.3 SELECTION AND PAYMENT

- A. Owner will employ and pay for services of an independent LEA accepted testing laboratory to perform specified inspection and testing. Per Title 24, Part 1 Section 4-335.

1.4 QUALITY ASSURANCE

- A. Comply with requirements of ANSI/ASTM E329 and ANSI/ASTM D3740
- B. Laboratory: Approved by the Division of the State Architect (DSA).
- C. Laboratory Staff: Maintain a full time registered technician on staff to review services.
- D. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to either National Bureau of Standards (NBS) Standards or accepted values of natural physical constants.
- E. Tests and inspections shall be conducted in accordance with the requirements of the Specifications or, if not specified, in accordance with the latest standards of ASTM, ACI or other recognized authorities.

1.5 LABORATORY RESPONSIBILITIES

- A. Test samples of mixes submitted by Contractor.
- B. Provide qualified personnel at site. Cooperate with Architect, Inspector of Record and Contractor in performance of services.
- C. Perform specified inspection, 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, Inspector of Record and Contractor of observed irregularities or non-conformance of Work or Products.
- F. Perform additional inspections and tests required by Architect.
- G. Attend preconstruction conferences and progress meetings.

1.6 LABORATORY REPORTS

- A. After each inspection and test, promptly upload the following DSA required testing reports to DSA Box: DSA-291 Laboratory Verified Report, DSA-292 Special Inspection Verified Report or DSA-293 Geotechnical Verified Report.
- B. Include the following in each report:
 - a. Date issued,
 - b. Project title and number,
 - c. Name of inspector,
 - d. Date and time of sampling or inspection,
 - e. Identification of product and Specifications Section,
 - f. Location in the Project,
 - g. Type of inspection or test,
 - h. Date of test,
 - i. Results of tests,
 - j. Conformance with Contract Documents.
- C. When requested by Architect, provide interpretation of test results.

1.7 LIMITS ON TESTING LABORATORY AUTHORITY

- A. Laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
- B. Laboratory may not approve or accept any portion of the Work.
- C. Laboratory may not assume any duties of Contractor.
- D. Laboratory has no authority to stop the Work.

1.8 CONTRACTOR RESPONSIBILITIES

- A. Deliver to laboratory at designated location adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
- B. Cooperate with laboratory personnel, and provide access to the Work and to manufacturer's facilities.
- C. Provide incidental labor and facilities to provide access to Work to be tested, to obtain and handle samples at the site or at source of products to be tested, to facilitate tests and inspections, storage and curing of test samples.
- D. Notify Architect/Engineer and laboratory 24 hours prior to expected time for operations requiring inspection and testing services.

SECTION 01 45 29
TESTING LABORATORY SERVICES

- E. The laboratory shall notify the Contractor, or his authorized representative, of any Work that is not in full conformance with the Specifications and the Architect shall be informed of such notification. Such nonconforming items shall not be incorporated in the finished Work unless specifically approved by Architect.
- F. The Contractor shall compensate the Architect or Engineers, at their standard hourly rates, for any additional services provided to analyze or justify non-compliant test results caused by substitutions, materials other than those specified or poor workmanship.

1.9 ADDITIONAL TESTS

- A. The Architect reserves the right to require additional tests to those specified, or upon materials not herein specified for testing.
- B. If the results of any test disclose noncompliance with the Drawings or requirements of the Specifications, the Architect reserves the right to require additional tests at the expense of the Contractor.

1.10 SCHEDULE OF INSPECTIONS AND TESTS

- A. Test and inspection list as approved by the Division of the State Architect.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. This section describes temporary construction facilities and temporary controls.
 - 1. Temporary Utilities: Electricity, lighting, heat, ventilation, telephone service, water, and sanitary facilities.
 - 2. Temporary Controls: Barriers, enclosures and fencing, protection of the Work, construction aids, water control and construction waste management program.
 - 3. Construction Facilities: Access roads, parking, progress cleaning, Project identification, Field offices, telephone service, and storage.
- B. Provide temporary construction facilities and temporary controls as required to conform to applicable authorities and as required to complete Project in accordance with Contract Documents.
 - 1. Authorities: Contact governing authorities to establish extent of temporary facilities and temporary controls required by authorities.

1.2 ELECTRICITY AND LIGHTING

- A. Provide electrical service required for construction operations, with branch wiring and distribution boxes located to allow service and lighting by means of construction-type power cords.
 - 1. Contractor may connect to on site power source at no charge. Exercise measures to conserve energy.
 - 2. Comply with NEMA, NECA and UL standards and regulations for temporary electric service. Install service in compliance with NFPA 70.
- B. Provide lighting for construction operations.
 - 1. Permanent lighting may be used during construction; maintain lighting and make routine repairs. Exercise measures to conserve energy.

1.3 HEAT AND VENTILATION

- A. Provide heat and ventilation as required to maintain specified conditions for construction operation, to protect materials and finishes from damage due to temperature and humidity.
- B. Systems being installed as part of the Work shall not be used for construction heat and ventilation. All ductwork, vents and diffusers shall be completed sealed from construction.
- C. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

1.4 WATER AND SANITARY FACILITIES

- A. Contractor may connect to on site supply at no charge.

SECTION 01 50 00
TEMPORARY FACILITIES & CONTROLS

- B. Provide and maintain required sanitary facilities and enclosures. Existing or new facilities shall not be used.

1.5 ACCESS ROADS

- A. Construct and maintain temporary roads accessing public thoroughfares to serve construction area.
- B. Extend and relocate as Work progress requires. Provide detours necessary for unimpeded traffic flow.
- C. Provide and maintain access to fire hydrants, free of obstructions.
- D. Provide means of removing mud from vehicle wheels before entering streets.
- E. Designated existing on-site roads may be used for construction traffic.

1.6 PARKING

- A. Parking will be allowed in areas designated by Owner

1.7 CONSTRUCTION AIDS

- A. Noise, Dust and Pollution Control: Provide materials and equipment necessary to comply with local requirements for noise, dust and pollution control.
- B. Fire Protection: Maintain on-site fire protection facilities as required by applicable authorities and insurance requirements.
- C. Dewatering: Provide and operate drainage and pumping equipment; maintain excavations and site free of standing water.

1.8 ENCLOSURES

- A. Temporary Exterior Closures: Provide temporary weather-tight closures for exterior openings for acceptable working conditions, for protection for materials, to protect interior materials from dampness, for temporary heating, and to prevent unauthorized entry.
 - 1. Provide doors with self-closing hardware and locks.
- B. Provide temporary partitions and ceilings as required to separate work areas from Owner occupied areas, to prevent penetration of dust and moisture into Owner occupied areas, and to prevent damage to existing materials and equipment.

1.9 BARRIERS

- A. Barriers: Provide barriers as required to prevent public entry to construction areas and to protect adjacent properties from damage from construction operations.
 - 1. Fence: Provide minimum 6 foot high commercial grade chain link or painted solid wood fence around construction site; equip with gates with locks.
- B. Barricades: Provide barricades as required by governing authorities.

SECTION 01 50 00
TEMPORARY FACILITIES & CONTROLS

- C. Tree Protection: No parking of vehicles will be allowed under trees. Provide barriers around trees and plants designated to remain; protect plants at their drip lines against vehicular traffic. Protect against stored materials, dumping, chemically injurious materials, and puddling or continuous running water.

1.10 CLEANING DURING CONSTRUCTION

- A. Control accumulation of waste materials and rubbish; recycle or dispose of off-site.
- B. Clean interior areas prior to start of finish work, maintain areas free of dust and other contaminants during finishing operations.

1.12 PROJECT IDENTIFICATION

- A. Project Sign: Provide minimum 32 square foot Project identification sign of wood frame and exterior grade plywood construction, painted, with exhibit lettering by professional sign painter.
 - 1. Design: As furnished by Architect.
 - 2. Submit to Owner and Architect additional names or changes proposed to Project sign for prior written approval.
 - 3. Erect on site at location established by Architect.
- B. Other Signs: Subject to approval of Architect and Owner.

1.13 FIELD OFFICES, COMMUNICATIONS, AND STORAGE

- A. Office: Provide weather-tight field office, with lighting, electrical outlets, data outlets, heating, and ventilating equipment, and equipped with furniture.
 - 1. A meeting space near the area of the work will be designated by the Owner.
 - 2. Inspector Space: Provide separate office for District's Project Inspector
 - 3. Telephone Service: Provide telephone service to field office. Cellular service is acceptable.
 - 4. Copier: Provide separate plain paper copier with enlargement and reduction capability.
 - 5. Internet Service: Provide broadband internet service to field office.
 - 6. Computer: Provide desktop computer system at Project field office with e-mail capacity and word processing system compatible with Architect's systems and Alliance2Build project Management system; include separate e-mail line; provide plain paper printer.
 - a. Digital Camera: Maintain operational digital camera on-site during construction long with software allowing transmission of digital pictures taken on-site via e-mail to Owner and Architect.
- B. Storage for Tools, Materials, and Equipment: Limit on-site storage to Project area; provide weather-tight storage, with heat and ventilation for products requiring controlled conditions.
 - 1. Maintain adequate space for organized storage and access.

2. Provide lighting for inspection of stored materials.

PART 2 – PRODUCTS (not used)

PART 3 – EXECUTION

3.1 WATER CONTROL

- 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.

3.2 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 minimize 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.

3.3 SECURITY

- A. Provide security and facilities to protect Work, and existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.
- B. Coordinate with Owner's security program.

3.4 CONSTRUCTION WASTE

- A. Construction Waste Management: Comply with applicable regulations for diverting Project waste from landfill; aim for waste management goal of 50% or higher.
 1. Effect optimum control of solid wastes.
 2. Prevent environmental pollution and damage.
- B. Reports: Provide as required by applicable authorities.

SECTION 01 50 00
TEMPORARY FACILITIES & CONTROLS

- C. Recycling: Implement recycling program that includes separate collection of waste materials of types as applicable to Project; recycling program to be applied by Contractors and subcontractors.
- D. Handling: Keep materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to recycling process.
 - 1. Clean materials contaminated prior to placing in collection containers.
 - 2. Arrange for collection by or delivery to appropriate recycling center or transfer station that accepts construction and demolition waste for purpose of recycling.
- E. Participate in Re-Use Programs: Rebates, tax credits, and other savings obtained for recycled or re-used materials shall accrue to Contractor.

3.5 REMOVAL

- A. Remove temporary materials, equipment, services, and construction prior to Substantial Completion Inspection.
- B. Clean and repair damage caused by installation or use of temporary facilities.
- C. Restore existing facilities used during construction to specified or original condition.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. This section describes basic product requirements governing material and equipment.
 - 1. General product requirements.
 - 2. Product list.
 - 3. Quality assurance.
 - 4. Delivery, storage, and handling.

1.2 GENERAL PRODUCTS REQUIREMENTS

- A. Products include material, equipment, and systems.
- B. Comply with Specifications, referenced standards, and applicable codes and regulations as minimum requirements.
- C. Provide new materials except as specifically allowed by Contract Documents.
- D. Materials to be supplied in quantity within a Specification section shall be by one manufacturer, shall be the same, and shall be interchangeable.
- E. Provide equipment and systems composed of materials from a single manufacturer except where otherwise recommended by equipment or systems manufacturer or where otherwise indicated in Contract Documents.

1.3 SUBMITTALS

- A. Submittal 01 60 00 A: Product List: Prior to submittal of second Request for Payment, submit to Architect complete list of major products that are proposed for installation, with name of manufacturer, trade name, and model.
 - 1. Tabulate products by Specification number and title.
- B. Substitutions: Refer to Section 01 62 00 - Product Options.

1.4 QUALITY ASSURANCE

- A. Comply with industry standards and applicable codes except when more restrictive tolerances or requirements indicate more rigid standards or precise workmanship.
- B. Comply with manufacturer's instructions.
- C. Perform work by persons qualified to produce workmanship of specified quality.
- D. Install products straight, true-to-line, and in correct relationship to adjacent materials, with hairline joints, free of rough, sharp and potentially hazardous edges.
- E. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, and racking.
 - 1. Seismic Anchors: Conform to code requirements.

**SECTION 01 60 00
PRODUCT REQUIREMENTS**

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Transport products by methods to avoid product damage, deliver in undamaged condition in manufacturer's unopened containers or packaging.
- B. Store products in accordance with manufacturer's instructions, with seals and labels intact and legible.
- C. Store sensitive products in weather-tight enclosures; maintain within temperature and humidity ranges required by manufacturer's instructions.
- D. For exterior storage of fabricated products, place on sloped supports above ground.
- E. Store loose granular materials on solid surfaces in a well-drained area; prevent mixing with foreign matter.
- F. Arrange storage to provide access for inspection; periodically inspect to assure products are undamaged and are maintained under required conditions.
- G. Provide equipment and personnel to handle products by methods to prevent soiling and prevent damage.
- H. Promptly inspect shipments to assure products comply with requirements, quantities are correct, and products are undamaged.
- I. Immediately remove from Project products damaged, wet, stained, and products with mold and products with mildew.
 - 1. Take special care to prevent absorbent products such as gypsum board and acoustical ceiling units from becoming wet.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide products listed in Contract Documents, products by manufacturers listed in Contract Documents, and products meeting specified requirements.
 - 1. Contract Amount: Base on materials and products included in Contract Documents.
 - a. Where listed in Contract Documents, materials and products by manufacturers not listed shall not be used without Owner's and Architect's approval of Contractor's written request for substitution.
- B. Procedures are described for requesting substitution of unlisted materials in lieu of materials named in Specifications or approved for use in addenda.

1.2 CONTRACTOR'S OPTIONS

- A. Products Identified by Reference Standards: Select product meeting referenced standard for products specified only by reference standard.
- B. Named Manufacturers and Named Products: Select products of any named manufacturer meeting Specifications for products specified by naming one or more products or manufacturers.
- C. Substitutions for Named Manufacturers and Named Products: Submit request for substitution for products and for manufacturers not specifically named where products or manufacturers are named in Specifications.
- D. "Or Equal" Clauses: Submit request for substitution for product or manufacturer not specifically named in Specifications where terms "or equal", "or approved equal", or similar references are made.

1.3 SUBSTITUTIONS

- A. Architect/Engineer will consider requests for Substitutions only within 20 days after date established in Notice to Proceed.
- B. Substitutions may be considered when a product becomes unavailable through no fault of the Contractor.
- C. 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.
- D. Substitution Submittal Procedure:
 - 1. Submit three physical copies or one electronic copy of Request for Substitution data for consideration. Submit completed "Product Substitution Request Form 01 62 33". Limit each request to one proposed Substitution.
 - 2. Submit shop drawings, product data, and certification test results attesting to the proposed product equivalence.
 - 3. The Architect will notify Contractor, in writing, of decision to accept or reject request.
 - 4. Incomplete substitution requests will be rejected without explanation.
 - 5. The Architect may reject any substitution request on the basis of aesthetics.

- E. "Approved Equal" or "Equal" shall mean in the opinion of the Architect.
- F. Substitutions will not be considered for acceptance when:
 - 1. They are indicated or implied on submittals without a formal request from Contractor.
 - 2. They are requested directly by a subcontractor or supplier.
 - 3. Acceptance will require substantial revision of Contract Documents.
- G. Substitute products shall not be ordered without written acceptance of Owner and Architect.
- H. Owner and Architect will determine acceptability of proposed substitutions and reserve right to reject proposals due to insufficient information.
- I. Any substitutions that change or affect the Structural, Access or Fire & Life Safety portions of the project construction documents shall be approved by DSA.

1.4 CONTRACTOR'S REPRESENTATION

- A. Requests constitute a representation that Contractor:
 - 1. Has investigated proposed product and determined it meets or exceeds, in all respects, specified product.
 - 2. Will provide same warranty or longer warranty for substitution as for specified product.
 - 3. Will coordinate installation and make other changes that may be required for Work to be complete in all respects.
 - 4. Waives claims for additional costs or time that subsequently become apparent.
 - 5. Will pay costs of changes to Contract Documents, Drawings, details and Specifications required by accepted substitutions.

1.5 ARCHITECT'S DUTIES

- A. Review Contractor's requests for substitutions with reasonable promptness.
 - 1. Architect will recommend that Owner accept or reject substitution request.
 - 2. Architect/Engineer will provide estimate of cost to be borne by Contractor for changes to Contract Documents, Drawings, details and Specifications that are required by substitutions. Written acceptance of charges by Contractor is required prior to any cost being incurred by the Architect/Engineer.
- B. Notify Contractor in writing of decision to accept or reject requested substitution.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION

SECTION 01 62 33
PRODUCT SUBSTITUTION REQUEST FORM

Project: Manzanita Elementary School Modernization
NMR Project No.: 18-2877

Substitution Request No.: _____
Submittal No.: _____
Date : _____

To: Nichols, Melburg & Rossetto Architects
300 Knollcrest Drive
Redding, CA 96002

From:

1) Specification Section of Item: _____

2) Specified Item: _____
Attach Product Data as required by Section 01 33 00

3) Proposed Substitution: _____
Attach Product Data as required by Sections 01 60 00 and 01 62 00

4) Itemized quality and performance comparison of proposed substitution with specified product. Indicate variations and appropriate specification section references. Attach summary.

5) Reason for submitting Substitution: _____

6) Does substitution effect dimensions shown on Drawings? Yes ___ No ___
If yes clearly indicate changes.

7) What effect does the substitution have on other trades or products?

8) What effect does the substitution have on the construction schedule?

**SECTION 01 62 33
PRODUCT SUBSTITUTION REQUEST FORM**

9) What effect does the substitution have on project cost?

10) What effect does the substitution have on maintenance services and replacement materials?

11) Provide any other information on changes to Drawings and Specifications that proposed substitution will require for its proper installation.

12) Does the guarantee and warranty provided with the proposed substitution equal or exceed those of the specified product? Yes___ No___

The undersigned agrees to pay for changes to the building design, including Architectural, Engineering, Agency Approval and Detailing costs caused by the requested substitution.

The undersigned states that the performance, function, appearance and quality of the proposed substitution are equivalent or superior to the specified item.

Submitted by: _____
Company Name Signature

DESIGN CONSULTANT REVIEW

- No Exception Taken Revise and Resubmit Rejected
- Submit Specified Item Furnish as Corrected See Summary Sheet Item
- Rejected, Request was submitted after the specified 20 day Substitution Review period
- Rejected, Request and data is incomplete for review

Date: _____ By: _____

PART 1 - GENERAL

1.1 SUMMARY

- A. This section describes execution requirements.
 - 1. Installer qualifications.
 - 2. Examination.
 - 3. Manufacturer's instructions.
 - 4. Installation.
 - 5. Final Cleaning.
 - 6. Protection.

1.2 INSTALLER QUALIFICATIONS

- A. Experienced Installers: Unless noted otherwise by a particular specification Section, installers shall have minimum of five years successful experience installing items similar to those required for Project, except for individuals in training under direct supervision of experienced installer.

1.3 EXAMINATION

- A. Acceptance of Conditions: Beginning installation of a product signifies installer has examined substrates, areas, and conditions for compliance with manufacturer requirements for tolerances and other conditions affecting performance.
- B. Field Measurements: Take field measurements as required to fit Work properly; recheck measurements prior to installing each product.
 - 1. Where portions of Work are to fit to other construction verify dimensions of other construction by field measurements before fabrication; allow for cutting and patching in order to avoid delaying Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

1.4 MANUFACTURERS' INSTRUCTIONS

- A. Manufacturer's Recommendations: When work is specified to comply with manufacturers' recommendations or instructions, distribute copies to persons involved and maintain one set in field office.
 - 1. Conform to requirements specified in Section 01 33 00 for submittal of recommendations or instructions to Architect; submit to Architect only where specified or where specifically requested.
- B. Perform work in accordance with details of recommendations and instructions and specified requirements.
 - 1. Should a conflict exist between Specifications and recommendations or instructions consult with Architect.
- C. Where manufacturer's information notes special recommendations in addition to installation instructions, comply with both recommendations and instructions.

1.5 INSTALLATION

- A. Pre-Installation Meetings: Installers and suppliers are to attend pre-installation meetings scheduled by Contractor.
- B. Comply with manufacturers written recommendations and installation instructions unless more restrictive requirements are specified.
- C. Locate Work and components accurately, in correct alignment and elevation.
 - 1. Make vertical work plumb and horizontal work level.
 - 2. Install components to allow space for maintenance and ease of removal for replacement.
- D. Install products at time and under conditions to ensure best possible results; maintain conditions required for product performance until Substantial Completion.
- E. Conduct operations so no part of Work is subject to damaging operations or loading in excess of that expected during normal conditions.
- F. Securely anchor permanent construction in place, accurately located and aligned with other portions of Work.
- G. Allow for building movement including thermal expansion and contraction.
- H. Make joints of uniform width; arrange joints as indicated, for best visual effect where not otherwise indicated; fit exposed connections together to form hairline joints except where otherwise indicated.

1.6 FINAL CLEANING

- A. Cleaning During Construction: Specified in Section 01 50 00 - Temporary Facilities and Controls.
- B. Progress Cleaning: Keep installed areas clean using cleaning materials specifically recommended by manufacturers of product being cleaned; where not otherwise recommended use nontoxic materials that will not damage surfaces.
 - 1. Remove debris from concealed spaces before enclosing space.
 - 2. Supervise construction operations to assure no part of construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during construction period.
- C. Final Cleaning: Execute final cleaning at Substantial Completion.
 - 1. Clean interior and exterior surfaces exposed to view; remove temporary labels, stains and foreign substances; polish transparent and glossy surfaces; vacuum carpeted and soft surfaces.
 - a. Vacuuming Equipment: Type with high efficiency particulate arrestor (HEPA) type filters; properly maintained.
 - 2. Clean equipment and fixtures to a sanitary condition, clean filters of mechanical equipment, replace filters where cleaning is impractical.

**SECTION 01 70 00
EXECUTION REQUIREMENTS**

- a. Clean ducts.
3. Clean site; sweep paved areas.
4. Remove waste, surplus materials and rubbish from Project and site; recycle to maximum extent feasible.

1.7 PROTECTION

- A. Protect products subject to deterioration with impervious cover. Provide ventilation to avoid condensation and trapping water.
- B. Take care to use protective covering and blocking materials that do not soil, stain, or damage materials being protected.
- C. After installation, provide coverings to protect products from damage from traffic and construction operations, remove when no longer needed.
- D. Protect interior materials from water damage; immediately remove wet materials from site to prevent growth of mold and mildew on site.

PART 2 – PRODUCTS (not used)

PART 3 – EXECUTION (not used)

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Contractor shall be responsible for cutting, fitting and patching required to complete Work and to:
1. Make its parts fit together properly.
 2. Uncover work to provide for installation of ill-timed work.
 3. Remove and replace defective work.
 4. Remove and replace work not conforming to Contract Documents.
 5. Remove samples of installed work as required for testing.
 6. Provide routine penetrations of non-structural surfaces for installation of piping and electrical conduit.

1.2 REQUESTS FOR INFORMATION

- A. Submit a written request to Architect well in advance of executing cutting or alteration which affects:
1. Work of Owner or separate contractor.
 2. Structural value or integrity of any element of Project.
 3. Integrity of weather-exposed or moisture-resistant elements.
 4. Efficiency, operational life, maintenance or safety of operational elements.
 5. Visual qualities of sight-exposed elements.
- B. Requests shall include:
1. Identification of Project and description of affected work.
 2. Necessity for cutting or alteration.
 3. Effect on work of Owner or separate contractor.
 4. Effect on structural integrity, or weatherproof integrity of Project.
 5. Alternatives to cutting and patching.
 6. Cost proposal, when applicable.
 7. Written permission of separate contractor whose work will be affected.
 8. Description of proposed work including:
 - a. Scope of cutting, patching, alteration, or excavation.
 - b. Products proposed to be used.
 - c. Extent of refinishing to be included.

- C. Should conditions of Work or schedule indicate a change of products from original installation, Contractor shall submit request for substitution as specified in Section 01 62 00 - Product Options.
- D. Submit written notice to Architect designating date and time that work will be uncovered.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Comply with Specifications and standards for each specific product involved.
- B. Where Specifications and standards have not been provided, provide materials and fabrication consistent with quality of Project and intended for commercial construction.
- C. Provide new materials for cutting and patching unless otherwise indicated.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Inspect existing conditions of Project, including elements subject to damage or to movement during cutting and patching.
- B. After uncovering work, inspect conditions affecting installation of products, or performance of work.
- C. Report unsatisfactory or questionable conditions to Architect in writing; do not proceed with work until Architect has provided further instructions.

3.2 PREPARATION

- A. Provide adequate temporary support as necessary to assure structural value or integrity of affected portion of Work.
 - 1. Provide services of licensed engineer for designing temporary support where required by applicable authorities for temporary supports and for shoring; submit engineering calculations directly to applicable authorities upon request.
- B. Protect other portions of Project from damage.

3.3 PERFORMANCE

- A. Execute cutting by methods that provide proper surfaces to receive installation of repairs and finishes.
 - 1. Execute excavating and backfilling by methods which will prevent settlement and which will prevent damage to other work.
- B. Employ same installer or fabricator to perform cutting and patching work as employed for new construction for:
 - 1. Weather-exposed or moisture resistant elements.
 - 2. Sight-exposed finished surfaces.

**SECTION 01 73 29
CUTTING & PATCHING**

- C. Execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances and finishes.
- D. Restore work that has been cut or removed; install new products to provide completed Work in accordance with requirements of Contract Documents.
- E. Fit work tight to pipes, sleeves, ducts, conduit and penetrations through surfaces.
- F. Refinish entire surfaces as necessary to provide even finish to match adjacent finishes:
 - 1. For continuous surfaces, refinish to nearest intersection.
 - 2. For an assembly, refinish entire unit.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for the following:
 - 1. Salvaging nonhazardous demolition and construction waste.
 - 2. Recycling nonhazardous demolition and construction waste.
 - 3. Disposing of nonhazardous demolition and construction waste.
- B. See Division 02 Section "Site Demolition" for disposition of waste resulting from site clearing and removal of above- and below-grade improvements.

1.2 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging. Alternative Daily Cover (ADC) does not qualify as material diverted from disposal. Land-clearing debris is not considered construction, demolition, or renovation waste that can contribute to waste diversion.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.3 PERFORMANCE REQUIREMENTS

- A. General: Develop and implement a construction and demolition waste management plan that results in end-of-Project rates for salvage/recycling of at least **75** percent by weight of total waste generated by the Work.

1.4 SUBMITTALS

- A. Waste Management Plan: Submit 3 copies of plan within 14 days of date established for the Notice to Proceed.

SECTION 01 74 19
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

- B. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit three copies of report. Include separate reports for demolition and construction waste. Include the following information:
1. Material category.
 2. Generation point of waste.
 3. Total quantity of waste in tons.
 4. Quantity of waste salvaged, both estimated and actual in tons.
 5. Quantity of waste recycled, both estimated and actual in tons.
 6. Total quantity of waste recovered (salvaged plus recycled) in tons.
 7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
- C. Waste Reduction Calculations: Before request for Substantial Completion, submit three copies of calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.
- D. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
- E. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
- F. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- G. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- H. Qualification Data: For Waste Management Coordinator.
- I. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

1.5 QUALITY ASSURANCE

- A. Waste Management Coordinator Qualifications: Minimum 2 years construction experience.
- B. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.
- C. Waste Management Conference: Conduct conference at Project site.

SECTION 01 74 19
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

1.6 WASTE MANAGEMENT PLAN

- A. General: Develop plan consisting of waste identification and waste reduction work plan. Include separate sections in plan for demolition and construction waste. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.
- B. Waste Identification: Indicate anticipated types and quantities of demolition site-clearing and construction waste generated by the Work. Include estimated quantities and assumptions for estimates. Identify at least five materials (both structural and nonstructural) targeted for diversion.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures. Specify whether materials will be separated or comingled.
 - 1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.
 - 2. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
 - 3. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
 - 4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
 - 5. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
 - 6. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

- A. General: Implement waste management plan as approved by Architect. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
- B. Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan. Coordinator shall be present at Project site full time for duration of Project.
- C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.
 - 1. Distribute waste management plan to everyone concerned within three days of submittal return.

SECTION 01 74 19
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.
- D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
 2. Comply with Division 01 Section "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

3.2 SALVAGING DEMOLITION WASTE

- A. Salvaged Items for Reuse in the Work:
1. Clean salvaged items.
 2. Pack or crate items after cleaning. Identify contents of containers.
 3. Store items in a secure area until installation.
 4. Protect items from damage during transport and storage.
 5. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.
- B. Salvaged Items for Sale and Donation: Not permitted on Project site.
- C. Salvaged Items for Owner's Use:
1. Clean salvaged items.
 2. Pack or crate items after cleaning. Identify contents of containers.
 3. Store items in a secure area until delivery to Owner.
 4. Transport items to Owner's storage area on-site.
 5. Protect items from damage during transport and storage.

3.3 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Recycling Receivers and Processors: List below is provided for information only; available recycling receivers and processors include, but are not limited to, the following:
1. County of Shasta
- C. Recycling waste materials shall accrue to Contractor.
- D. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical.
1. Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.

SECTION 01 74 19
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

- a. Inspect containers and bins for contamination and remove contaminated materials if found.
2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
4. Store components off the ground and protect from the weather.
5. Remove recyclable waste off Owner's property and transport to recycling receiver or processor.

3.4 RECYCLING DEMOLITION WASTE

- A. Asphaltic Concrete Paving: Grind asphalt to maximum 1-1/2-inch size, or as required by recycling facility.
- B. Asphaltic Concrete Paving: Break up and transport paving to asphalt-recycling facility.
- C. Concrete: Remove reinforcement and other metals from concrete and sort with other metals.
 1. Pulverize concrete to maximum 1-1/2-inch size, or as required by recycling facility.
- D. Masonry: Remove metal reinforcement, anchors, and ties from masonry and sort with other metals.
 1. Pulverize masonry to maximum 1-1/2-inch size, or as required by recycling facility.
 2. Clean and stack undamaged, whole masonry units on wood pallets.
- E. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.
- F. Metals: Separate metals by type.
 1. Structural Steel: Stack members according to size, type of member, and length.
 2. Remove and dispose of bolts, nuts, washers, and other rough hardware.
- G. Asphalt Shingle Roofing: Separate organic and glass-fiber asphalt shingles and felts. Remove and dispose of nails, staples, and accessories.
- H. Gypsum Board: Stack large clean pieces on wood pallets and store in a dry location. Remove edge trim and sort with other metals. Remove and dispose of fasteners.
- I. Acoustical Ceiling Panels and Tile: Stack large clean pieces on wood pallets and store in a dry location.
 1. Separate suspension system, trim, and other metals from panels and tile and sort with other metals.
- J. Carpet and Pad: Roll large pieces tightly after removing debris, trash, adhesive, and tack strips.
 1. Store clean, dry carpet and pad in a closed container or trailer provided by Carpet Reclamation Agency or carpet recycler.

SECTION 01 74 19
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

- K. Equipment: Drain tanks, piping, and fixtures. Seal openings with caps or plugs. Protect equipment from exposure to weather.
- L. Plumbing Fixtures: Separate by type and size.
- M. Piping: Reduce piping to straight lengths and store by type and size. Separate supports, hangers, valves, sprinklers, and other components by type and size.
- N. Lighting Fixtures: Separate lamps by type and protect from breakage.
- O. Electrical Devices: Separate switches, receptacles, switchgear, transformers, meters, panel boards, circuit breakers, and other devices by type.
- P. Conduit: Reduce conduit to straight lengths and store by type and size.

3.5 RECYCLING CONSTRUCTION WASTE

- A. Packaging:
 - 1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
 - 2. Polystyrene Packaging: Separate and bag materials.
 - 3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
 - 4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.
- B. Site-Clearing Wastes: Chip brush, branches, and trees on-site at location indicated by owner.
- C. Wood Materials:
 - 1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
 - 2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.
- D. Gypsum Board: Stack large clean pieces on wood pallets and store in a dry location.
 - 1. Clean Gypsum Board: Grind scraps of clean gypsum board using small mobile chipper or hammer mill. Screen out paper after grinding.

3.6 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 - 1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

SECTION 01 74 19
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

- B. Burning: Do not burn waste materials.
- C. Burning: Burning of waste materials is permitted only at designated areas on Owner's property, provided required permits are obtained. Provide full-time monitoring for burning materials until fires are extinguished.
- D. Disposal: Transport waste materials and dispose of at designated spoil areas on Owner's property.
- E. Disposal: Transport waste materials off Owner's property and legally dispose of them.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Starting systems.
- B. Testing, adjusting, and balancing.

1.2 STARTING SYSTEMS

- A. Coordinate schedule for start-up of various equipment and systems.
- B. Notify Architect and Owner 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, or other conditions that may cause damage.
- D. Verify that tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- E. Verify wiring and support components for equipment are complete and tested.
- F. Execute start-up under supervision of responsible Contractors' personnel in accordance with manufacturers' instructions.
- G. When specified in individual specification Sections, require manufacturer to provide installation prior to start-up, and to supervise placing equipment or system in operation.
- H. Submit a written report in accordance with Section 01 40 00 that equipment or system has been properly installed and is functioning correctly.

1.3 TESTING, ADJUSTING, AND BALANCING

- A. Contractor shall employ services of an independent firm to perform testing, adjusting and balancing. Contractor shall pay for services.
- B. The independent firm will perform services specified in Electrical and Mechanical sections.
- C. Reports will be submitted by the independent firm to the Architect indicating observations and results of tests and indicating compliance or non-compliance with specified requirements and with the requirements of the Contract Documents.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Protection for products, including Owner-provided products, after installation.

1.2 PROTECTION AFTER INSTALLATION

- A. Protect installed products and control traffic in immediate area to prevent damage from subsequent operations.
- B. Provide protective covers at walls, projections, corners, jambs, sills and soffits in and adjacent to traffic areas.
- C. Cover walls and floors of elevator cabs, and jambs of cab doors, when elevators are used by construction personnel.
- D. Protect finished floors and stairs from dirt, wear and damage:
 - 1. Secure heavy sheet goods or similar protective materials in place, in areas subject to foot traffic.
 - 2. Lay planking or similar rigid materials in place, in areas subject to movement of heavy objects.
 - 3. Lay planking or similar grid materials in place in areas where storage of products will occur.
 - 4. Distribute loads of heavy stockpile materials, such as gypsum wall board, to prevent floor loading conditions in excess of loading capacity.
- E. Protect waterproofed and roofed surfaces:
 - 1. Restrict use of surfaces for traffic of any kind, and for storage of products.
 - 2. When an activity is mandatory, obtain recommendations for protection of surfaces from installer or manufacturer. Install protection and remove on completion of activity. Restrict use of adjacent unprotected areas.
- F. Restrict traffic of any kind across planted lawn and landscape areas.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not used

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. This section describes Contract closeout procedures.
 - 1. Substantial completion.
 - 2. Final completion.
 - 3. Project record documents.
 - 4. Material and finish data.
 - 5. Operation and maintenance data.
 - 6. Final Payment
- B. Refer to Section 01 78 36 for Warranty requirements.

1.2 SUBSTANTIAL COMPLETION

- A. When Contractor considers the Work or a designated portion thereof is substantially complete, submit written notice, with list of items to be completed or corrected.
 - 1. List ("Punch List"): Format pre-approved by Owner and Architect; tabular form with each space listed required.
- B. Within a reasonable time Owner will inspect status of completion and may add to "Punch List".
- C. Should Owner determine Work is not substantially complete, Contractor will be promptly notified in writing, giving reasons.
- D. Contractor shall remedy deficiencies and send a second written notice of substantial completion; Owner will re-inspect Work.
- E. When Owner determines Work is substantially complete, a letter of notification of Substantial Completion will be prepared.

1.3 FINAL COMPLETION

- A. When Work is complete, submit written certification indicating:
 - 1. Work has been inspected for compliance with Contract Documents.
 - 2. Work has been completed in accordance with Contract Documents and deficiencies listed (in 'Punch List') with Certificate of Substantial Completion have been corrected.
 - 3. Equipment and systems have been tested in presence of Owner's representative and are operational.
 - 4. Work is complete and ready for final inspection.
- B. Special Submittals: In addition to submittals required by Contract, submit following.
 - 1. Provide submittals required by governing authorities to governing authorities with copies included in Project Record Documents.

2. Submit final statement of accounting giving total adjusted Contract Sum, previous payments, and sum remaining due.

1.4 PROJECT RECORD DOCUMENTS

- A. Keep documents current; do not permanently conceal any work until required information has been recorded.
 1. Contractor to maintain a separate set of Drawings for Project Record Documents (Refer to Section 01 78 39).
 2. Store reproducible Drawings, one set of Project Manual, and one copy of each Change Order separate from documents used for construction, for use as Project Record Documents.
 3. Indicate actual work on Drawings; indicate actual products used in Project Manual, including manufacturer, model number and options.
 4. Update Project Record Documents daily and allow for Architect inspection at least once a month.
- B. At Contract close-out submit documents with transmittal letter containing date, Project title, Contractor's name and address, list of documents, and signature of Contractor.

1.5 MATERIAL AND FINISH DATA

- A. Provide data for primary materials and finishes.
- B. Submit two sets prior to final inspection, bound in 8-1/2" by 11" three-ring binders with durable plastic covers, clearly identified regarding extent of contents.
 1. Electronic Format: Where available in electronic format, submit electronic media with material and finish data.
- C. Arrange by Specification division and give names, addresses, and telephone numbers of subcontractors and suppliers. List:
 1. Trade names, model or type numbers.
 2. Cleaning instructions.
 3. Product data.

1.6 OPERATION AND MAINTENANCE DATA

- A. Provide data for:
 1. Electrically operated items.
 2. Mechanical equipment and controls.
 3. Electrical equipment and controls.
- B. Submit **two** sets prior to final inspection, bound in 8-1/2" x 11" three-ring binders with durable plastic covers, clearly identified regarding extent of contents.
- C. Provide a separate volume for each system, with a table of contents and index tabs for each volume.

**SECTION 01 77 00
CONTRACT CLOSEOUT**

- D. Arrange by Specification division and gives names, addresses, and telephone numbers of subcontractors and suppliers. List:
 - 1. Appropriate design criteria.
 - 2. List of equipment and parts lists.
 - 3. Operating and maintenance instructions.
 - 4. Shop drawings and product data.
- E. Electronic Format: Where available in electronic format, submit electronic media with material and finish data.

1.7 FINAL PAYMENT

- A. When, in the opinion of the architect, the project is complete (after all punch list items are complete as described in Item 1.2 Substantial Completion), the Architect will advise the owner and the owner will file the Notice of Completion with the County Recorder.
- B. Should there be items not available due to delays in delivery, or should work remain incomplete, the Architect and the School District may require the Contractor to post a certified check in an agreed upon amount sufficient to cover such incomplete or uncorrected items. Such certified check shall be held until completion of all incomplete Work.
- C. The retention outlined in Section 01 26 00 shall be held by the Owner until forty (40) days after the date of recording of the Notice of Completion by the County Recorder. If no stop notices or encumbrances are filed and if all work is complete, the retention shall be paid the contractor. Assessed liquidated damages and extra services provided by the architect and inspector due to additional inspections of incomplete work shall be deducted from the retention.
- D. Final payment to the contractor will not be made until all requirements have been met and all documents set forth herein have been received, including but not limited to: Record Drawings, Warranties, Operation and Maintenance Manuals, Demonstration/Training and extra stock.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not used

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Compile required and incidental warranties required by Contract Documents.
- B. These warranties shall be in addition to and not a limitation of other rights Owner may have against Contractor under Contract Documents and which may be prescribed by law, regardless of wording of warranty.

1.2 FORM OF SUBMITTAL

- A. Provide duplicate copies, notarized or on Contractor and Manufacturer's letterhead.
 - 1. Assemble documents executed by subcontractors, installers, suppliers, and manufacturers.
 - 2. Provide table of contents and assemble in binder with durable plastic cover, clearly identified regarding extent of contents.
 - 3. Electronic Format: Submit warranties on electronic media in PDF format.
- B. Warranty Form: Use form acceptable to Owner; completed form shall not detract from or confuse interpretations of Contract Documents.
 - 1. General Contractor shall sign warranty.
 - 2. Subcontractor and installer shall sign warranty where specified.
 - a. Provide required manufacturer's warranties for waterproofing and roofing systems countersigned by subcontractor and installer.
- C. Submit final warranties prior to final application for payment.
 - 1. For equipment put into use with Owner's permission during construction, submit within ten days after first operation.
 - 2. For items of Work delayed materially beyond Date of Substantial Completion, provide updated submittal within ten days after acceptance, listing date of acceptance as start of warranty period.
- D. Provide information for Owner's personnel regarding proper procedure in case of failure and instances that might affect validity of warranty.
- E. Size: 8-1/2" by 11" for three-ring binder; fold larger sheets to fit.

1.3 WARRANTIES

- A. Warranties are intended to protect Owner against failure of work and against deficient, defective and faulty materials and workmanship, regardless of sources.

**SECTION 01 78 36
WARRANTIES**

- B. Limitations: Warranties are not intended to cover failures that result from:
1. Unusual or abnormal phenomena of the elements.
 2. Owner's misuse, maltreatment or improper maintenance of work.
 3. Vandalism after substantial completion.
 4. Insurrection or acts of aggression including war.
- C. Related Damages and Losses: Remove and replace work which is damaged as result of failure, or which must be removed and replaced to provide access for correction of warranted work.
- D. Warranty Reinstatement: After correction of warranted work, reinstate warranty for corrected work to date of original warranty expiration, but not less than half original warranty period.
- E. Replacement Cost: Replace or restore failing warranted items without regard to anticipated useful service lives.
- F. Rejection of Warranties: Owner reserves right to reject unsolicited and coincidental product warranties that detract from or confuse interpretations of Contract Documents.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not used

END OF SECTION

**SECTION 01 78 36.10
WARRANTY FORM**

(SUBMIT IN DUPLICATE)

PROJECT Manzanita Elementary School Modernization

LOCATION 1240 Manzanita Hills, Avenue, Redding, CA 96001

WARRANTY FOR _____

We hereby warrant that the _____

_____ work which we have installed in the above project for a period of _____ year(s) in accordance with the warranty period required in the specifications.

We agree to repair or replace any or all such work, together with any other work which may be displaced in so doing that may prove defective in workmanship or materials, within the period of _____ year(s) from date of filing of the **Notice of Completion**, without expense whatsoever to the Owner, ordinary wear and tear and unusual abuse or neglect excepted.

In the event of our failure to comply with the above-mentioned conditions within fifteen (15) days after being notified in writing, we collectively or separately do hereby authorize said Owner to proceed to have the defects repaired and made good at our expense and will pay the costs and charges therefrom immediately upon demand. We also agree to pay all costs related to litigation if we do not pay the costs you demand.

DATE: _____

SUBCONTRACTOR'S SIGNATURE: _____

CONTRACTOR'S SIGNATURE: _____

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for Project Record Documents, including the following:
 - 1. Record Drawings.
 - 2. Record Specifications.
 - 3. Record Product Data.
- B. See Section 01 77 00 Contract Closeout for Operation and Maintenance Manual requirements.
- C. See Divisions 02 through 49 Sections for specific requirements for Project Record Documents of the Work in those Sections.

1.2 SUBMITTALS

- A. Submittal No. 01 78 39 A - Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit one set of marked-up Record Prints.
 - 2. Number of Copies: Submit copies of Record Drawings as follows:
 - a. Initial Submittal: Submit one set of marked-up Record Prints. Architect will initial and date each plot and mark whether general scope of changes, additional information recorded, and quality of drafting are acceptable. Architect will return plots and prints for organizing into sets, printing, binding, and final submittal.
 - b. Final Submittal: Submit one set of marked-up Record Prints, and the following:
- B. Submittal No. 01 78 39 B - Record Specifications: Submit one copy of Project's Specifications, including addenda and contract modifications.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of blue- or black-line white prints of the Contract Drawings and Shop Drawings.
 - 1. Preparation: Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.

SECTION 01 78 39
PROJECT RECORD DOCUMENTS

- b. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
 - 2. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.
 - 3. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
 - 4. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
- 1. Record Prints: Organize Record Prints and newly prepared Record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
 - 2. Record Transparencies: Organize into unbound sets matching Record Prints. Place transparencies in durable tube-type drawing containers with end caps. Mark end cap of each container with identification. If container does not include a complete set, identify Drawings included.
 - 3. Record CAD Drawings: Organize CAD information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each CAD file.
 - 4. Identification: As follows:
 - a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Architect.
 - e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
- 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 - 3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
 - 4. Note related Change Orders, Record Product Data, and Record Drawings where applicable.

2.3 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of

SECTION 01 78 39
PROJECT RECORD DOCUMENTS

the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of Project.
- B. Maintenance of Record Documents and Samples: Store Record Documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Provide equipment and systems demonstration and instruction in accordance with Contract Documents.
2. Video-record seminars and system demonstrations.

1.2 DESCRIPTION

A. Seminar Agenda and Outline:

1. Prepare a seminar agenda and outline in consultation and cooperation with Owner. Include following:
 - a. Equipment and systems that will be included in seminars.
 - b. Name of companies and representatives presenting at seminars.
 - c. Outline of each seminar's content.
 - d. Time and date allocated to each system and item of equipment.
2. Submit preliminary seminar agenda and outline for review and comment by Owner two months before date of completion.

B. Seminar Organization:

1. Qualified Contractor or Sub-contractor personnel familiar with design, operation, maintenance and troubleshooting of equipment and systems shall lead seminars.
2. Coordinate individual presentations and ensure manufacturer's representatives scheduled to be at training seminars are present.
3. Coordinate proposed seminar dates with Owner and select mutually agreeable dates.
4. Video-recording: Arrange for recording of training seminars and system demonstrations, including seminar and demonstration questions and answers.

C. Seminar Content:

1. Contractor or manufacturer's representative will explain design philosophy of primary systems.
2. Include following information in presentations dealing with specific systems.
 - a. An overview of how system is intended to operate.
 - b. Describe design parameters, constraints and operational requirements.
 - c. Describe system operation strategies.
 - d. Provide information to help in identifying and troubleshooting problems.
 - e. Recommended preventative and routine maintenance.

**SECTION 01 79 00
DEMONSTRATION AND TRAINING**

D. System Demonstration:

1. Demonstrate operation of equipment and systems when specified in individual technical sections. Include following in demonstration.
 - a. Start-up and shut down.
 - b. Operation.
 - c. Scheduled and preventative maintenance.
 - d. Troubleshooting.
2. Demonstration may be conducted at time of original starting with Owner's prior approval.
3. Be prepared to answer questions raised by Owner's personnel at demonstrations and seminars.
4. Use manufacturer's operation and maintenance data as basis of instruction.

1.3 SUBMITTALS

- A. Video-records: Submit two copies; include label on each video disc and on each container identifying Project and Seminar content.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Demolition and removal of selected portions of the site and features as described in the Drawings.
2. Remove asphalt and concrete paving and surface debris as designated and as required for completion of sitework as indicated.
3. Repair procedures for selective demolition operations.

1.2 DEFINITIONS:

- A. Remove: Detach items from existing construction and legally dispose of them.
- B. Remove and Salvage: Detach items from existing construction and deliver them to Owner ready for reuse.
- C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.
- D. Existing to Remain: Existing items of construction that are not to be removed.

1.3 MATERIALS OWNERSHIP

- A. Except for items or materials indicated to be salvaged, reinstalled or otherwise indicated to remain the Owner's property, demolished materials shall become the Contractor's property and shall be removed from the site with further disposition at Contractor's option.

1.4 SUBMITTALS

- A. Submittal No. 02 41 13A – Not used.
- B. Submittal No. 02 41 13B – Not used.
- C. Submittal No. 02 41 13C - Schedule of Selective Demolition Activities: Indicate the following:
 1. Detailed sequence of selective demolition work, with starting and ending dates for each activity, and for each Phase indicated on the drawings.
 2. Interruption of utility services.
 3. Coordination for shutoff, capping, and continuation of utility services.
 4. Locations of temporary barriers and means of egress.
 5. Procedures to ensure uninterrupted progress of Owner's on-site operations.
 6. Coordination of Owner's continuing occupancy of portions of existing building(s) and of Owner's partial occupancy of completed Work.
- D. Submittal No. 02 41 13D - Not used.

1.5 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with governing EPA notification regulations before starting selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

SECTION 02 41 13
SELECTIVE SITE DEMOLITION

- B. Pre-Demolition Conference: Conduct conference at Project site to comply with requirements in Division 1 section "Project Management and Coordination." Review methods and procedures related to selective demolition including, but not limited to, the following:
 - 1. Inspect and discuss condition of site work to be selectively demolished.
 - 2. Review and finalize demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
 - 3. Review requirements of work performed by other trades that rely on substrates exposed by demolition operations.

1.6 PROJECT CONDITIONS

- A. Owner will occupy portions of the building immediately adjacent to selective site demolition area.
 - 1. Conduct selective demolition so Owner operations will not be disrupted.
 - 2. Provide the Architect with not less than 72 hours notice prior to activities that will affect Owner operations.
- B. Maintain access to existing walkways, corridors and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from authorities having jurisdiction.
- C. On-site storage or sale of removed items or materials will not be permitted.
- D. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
- E. Fire Protection: Maintain fire-protection services during selective demolition operations.
- F. Dust Control: Provide adequate dust control during selective demolition operations.

PART 2 - PRODUCTS

2.1 REPAIR MATERIALS

- A. Where available and appropriate for use, provide repair materials that are identical to existing materials.
- B. Where identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
- C. Use materials whose installed performance equals or surpasses that of existing materials.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Notify U.S.A. (Underground Service Alert) prior to construction.
- B. Upon discovery of unknown utility or concealed conditions, discontinue affected work; notify Architect/Engineer. Verify that utilities to be removed have been disconnected and capped.
- C. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- D. When encountering unanticipated mechanical, electrical or structural elements that conflict with the intended function or design, investigate and measure the nature and extent of the conflict. Promptly submit a written report to the Architect.

SECTION 02 41 13
SELECTIVE SITE DEMOLITION

- E. Survey the condition of the building to determine whether removing any element might result in a structural deficiency or unplanned collapse of any portion of the structure or adjacent structures during selective demolition.
- F. Temporary Site Control: Remove debris and conduct demolition operations in a manner to ensure minimum interference with roads, streets, walks, walkways, corridors, and other adjacent occupied or used facilities.
- G. Perform surveys as the selective demolition progresses to detect hazards resulting from the activities.
- H. Dangerous Materials: Drain, purge or otherwise remove, collect and dispose of chemicals, gases, explosives, acids, flammables or other dangerous materials before proceeding with selective demolition operations.
- I. Exercise all possible precautions to keep noise to a minimum. Selection and disposition of power equipment shall be made with consideration of the least possible interference due airborne noise.
- J. Do not close or obstruct streets, walks, walkways or other adjacent occupied or used facilities without permission from the Architect and authorities having jurisdiction.
- K. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
- L. Temporary Facilities: Conduct demolition operations in a manner to prevent injury to people and damage to adjacent building and facilities to remain.
 - 1. Provide for safe passage of people around selective demolition area.
- M. Protect existing site improvements, appurtenances and landscaping to remain.
- N. Provide temporary weather protection, during interval between demolition and removal of existing construction, on exterior surfaces and new construction to prevent water leakage or damage to structure or interior areas.
- O. Protect walls and other existing finish work that are to remain and are exposed during selective site demolition operations.
- P. Cover and protect site furnishings and equipment that have not been removed.

3.2 CLEARING

- A. Clear areas required for access to site and execution of Work.
 - 1. Topsoil: Excavated material, graded free of roots, rocks larger than one inch, subsoil, debris, and large weeds.
 - 2. Subsoil: Excavated material, graded free of lumps larger than 6 inches, rocks larger than 3 inches and debris.
 - 3. When excavation through roots is necessary, perform work by hand and cut roots with a sharp axe.
- B. Patch and repair areas damaged by demolition or installation of new improvements.
- C. Cap all electrical, water, sewer and signal lines, exposed by site clearing.
- D. Top Surface of Subgrade: Plus or minus one inch.

3.3 PROTECTION

- A. Protect plant growth and existing improvements remaining as final landscaping.
- B. Protect bench marks and existing work from damage or displacement.
- C. Maintain designated site access for vehicle and pedestrian traffic.
- D. Protect any and all existing utilities, pipes, conduits, vaults, manholes, cleanouts, boxes, and similar such structures not indicated to be removed or demolished from damage during demolition and construction.

3.4 UTILITY SERVICES

- A. Notify Owner's Representative five (5) days in advance of disconnecting utility services which will permanently or temporarily disrupt normal school operations.
- B. Existing Utilities: Maintain services indicated to remain and protect them against damage during selective demolition operations.
- C. Do not interrupt existing utilities serving occupied or operating facilities, except when authorized in writing by the Owner.
- D. Provide temporary services during interruptions to existing utilities, as acceptable to the Owner.
- E. Utility Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services serving areas to be selectively demolished.
- F. Owner will arrange to shut off indicated utilities when requested by Contractor.
- G. Where utility services are required to be removed, relocated or abandoned, provide bypass connections to maintain continuity of service to other parts of the building before proceeding with selective demolition.
- H. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve or plug and seal the remaining portion of pipe or conduit after bypassing.
- I. Do not start selective demolition work until utility disconnection and sealing have been completed and verified.

3.5 POLLUTION CONTROLS

- A. Disposal: Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Cleaning: Clean adjacent structures and site improvements of dust, dirt and debris caused by selective demolition operations. Return adjacent areas to condition existing before start of selective demolition.

3.6 SELECTIVE DEMOLITION

- A. Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete selective demolition within limitations of governing regulations and as follows:
 - 1. Proceed with selective demolition systematically. Conduct work in an order that avoids transporting removed items and debris through areas with completed selective demolition work, and that allows for removal of items before supports for those items are removed in another area.

**SECTION 02 41 13
SELECTIVE SITE DEMOLITION**

2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage adjoining construction to remain. Use hand or small power tools designed for sawing or grinding, not for hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
 3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations, and maintain adequate ventilation when using cutting torches.
 5. Lower removed structural framing members to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
 6. Locate selective demolition equipment throughout the structure and remove debris and materials so as not to impose excessive loads on supporting walls, floors or framing.
 7. Return elements of construction and surfaces to remain to condition existing before start of selective demolition operations.
- B. Existing Facilities: Comply with the Owner's regulations for using and protecting elevators, stairs, walkways, loading docks, building entries and other building facilities during selective demolition operations.
- C. Repair and Storage of Salvaged Items and Items to be Reinstalled:
1. Repair: Clean and repair the materials and equipment to functional condition adequate for intended reuse. Paint damaged or deteriorated painted surfaces of equipment to match new equipment.
 2. Storage: Store the materials and equipment in a secure area until final disposal.
- D. Disposal of Salvaged Items and Items to be Reinstalled:
1. Reinstallation: Where items are indicated to be removed and reinstalled, install the materials and equipment in locations indicated. Comply with installation requirements for new materials and equipment.
 2. Delivery to Owner: Where items are indicated to be removed and salvaged, transport the materials and equipment to the area on-site designated by the Architect or indicated on the Drawings.
- E. Protection of Salvaged Items: Pack or crate salvaged materials and equipment after removal. Identify contents of containers. Protect items from damage during transport and storage.
- F. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by the Architect, items may be removed to a suitable, protected storage location during selective demolition and then cleaned and reinstalled in their original locations.
- G. Air-Conditioning Equipment: Remove equipment without releasing refrigerants.

3.7 PATCHING AND REPAIRS

- A. Promptly patch and repair holes and damaged surfaces caused to adjacent construction by selective demolition operations.
- B. Repairs: Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.

**SECTION 02 41 13
SELECTIVE SITE DEMOLITION**

1. Completely fill holes and depressions in existing masonry walls to remain with an approved masonry patching material, applied according to the manufacturer's written recommendations.
- C. Finishes: Restore exposed finishes of patched areas and extend finish restoration into adjoining construction to remain in a manner that eliminates evidence of patching and refinishing.
- D. Wall Surfaces: Patch and repair wall surfaces where demolished walls or partitions result in extending one finished area into another. Provide a flush and even surface of uniform color and appearance.
 1. Closely match texture and finish of existing adjacent surface.
 2. Patch with durable seams that are as invisible as possible. Comply with specified tolerances.
 3. Where patching smooth painted surfaces, extend final paint coat over entire unbroken surface containing the patch after the patched surface has received primer and other specified undercoats.
 4. Remove existing wall materials and replace with new materials, if necessary to achieve uniform color and appearance.
 5. Where feasible, inspect and test patched areas to demonstrate integrity of the installation.

3.8 DISPOSAL OF DEMOLISHED MATERIALS

- A. Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.
- B. Do not burn demolished materials.
- C. Disposal: Transport demolished materials off Owner property and legally dispose of them.

3.9 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by clearing.
- B. Return adjacent areas to condition existing before clearing began.
- C. Leave site in a clean condition.

END OF SECTION

PART 1 GENERAL

1.1 WORK INCLUDED

- A. Saw-cut and remove portions of existing concrete as designated.
- B. Remove designated building equipment and fixtures.
- C. Remove designated partitions, surface finishes and related components.
- D. Remove designated ceiling finishes and related components.
- E. Remove and cap and identify utilities.
- F. Remove existing unit ventilators where indicated.
- G. Remove existing plumbing fixtures where indicated
- H. Remove existing windows where indicated.
- I. Removal of existing asbestos bearing materials shall be performed by a licensed asbestos abatement contractor, and shall be under separate contract.
- J. Protect existing building from weather damage.
- K. Demolition of Hazardous Materials as identified below.

1.2 EXISTING CONDITIONS

- A. Conduct demolition to minimize interference with adjacent building areas. Maintain protected egress and access at all times.
- B. Provide, erect, and maintain temporary barriers and security devices.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 PREPARATION

- A. Erect and maintain weatherproof closures for exterior openings and roof decks.
- B. Erect and maintain temporary partitions to prevent spread of dust, fumes, noise, and smoke to provide for Owner occupancy of adjacent wings. See plan for area affected.
- C. Protect existing items which are not indicated to be altered.
- D. Disconnect, remove, and cap designated utility services within demolition areas.

**SECTION 02 41 14
DEMOLITION FOR REMODELING**

- E. Mark location of disconnected utilities. Identify and indicate capping locations on Project Record Documents.

3.2 HAZARDOUS MATERIALS

- A. Regulatory Requirements
 1. The contractor and all subcontractors involved in this project shall have current knowledge of the United States Asbestos Hazard Emergency Response Act of 1987.
 2. The contractor and all subcontractors involved in this project shall have current knowledge of Title 8, California Code of Regulations, Section 1532.1 Construction Lead Standards.
- B. Reports: Notify architect or owner immediately upon encountering any asbestos construction materials.

3.3 EXECUTION

- A. Demolish in an orderly and careful manner. Protect existing supporting structural members, utility runs and landscaping. Assume existing components not specifically noted to be removed will remain. Protect to maintain original condition.
- B. Except where noted otherwise, immediately remove demolished materials from site.
- C. Remove materials to be re-installed or retained in manner to prevent damage. Store and protect under provisions of Section 01 60 00.
- D. Remove, store, and protect for re-installation materials and equipment hindering improvements.
- E. Remove material and equipment to be retained by Owner with care to avoid unnecessary damage.
- F. Remove and promptly dispose of contaminated, vermin infested, or dangerous materials encountered.
- G. Report any encounter with asbestos bearing materials to the Architect or Owner immediately and stop work in the area.
- H. Do not burn or bury materials on site.
- I. Remove demolished materials from site as work progresses. Upon completion of work, leave areas of work in clean condition.
- J. Repair areas to remain that are damaged by the Demolition.

END OF SECTION

PART 1 GENERAL

1.1 DESCRIPTION

- A. This section describes the requirements for common work related to concrete including, but not limited to bonding agents and cold and hot weather concreting.

1.2 RELATED WORK

- A. Division 1 – General Requirements
- B. Division 3 - Concrete

1.3 REFERENCES

- A. ACI 301 – Specifications for Structural Concrete Buildings
- B. Title 24, Part 2A, C.C.R. – Chapter 19A
- C. ACI 318 – Building Code Requirements for Structural Concrete
- D. ACI 305 – Hot Weather Concreting
- E. ACI 306 – Cold Weather Concreting

1.4 SUBMITTALS

All submittals shall be submitted under the provisions of Division 1 - General Requirements.

- A. Submittal No. 03 05 00 A – Product Data:
 - 1. Manufacturer's product data, specifications with application and installation instructions for proprietary materials and items, including admixtures, bonding agents, waterstops, joint systems, chemical floor hardeners, and dry shake finish materials.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 301 and ACI 318 Chapter 4.
- B. Obtain materials from the same source throughout the Work.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Bonding Agent:
 - 1. Bonding Materials: Polyvinyl acetate, rewettable type. Use in areas not subject to moisture.
 - 2. Bonding Compound: Latex, non-rewettable type.
 - 3. Bonding Admixture: Latex, non-wettable type.

4. Structural Bonding Epoxy Adhesive: Two-component, 100-percent solids, 100-percent reactive compound suitable for use on dry or damp surfaces.
5. Patching Compound: Free-flowing, polymer-modified cementitious coating.

PART 3 EXECUTION

3.1 PREPARATION

- A. Bonding: Roughen surface of set concrete at joints, except where bonding is obtained by use of concrete bonding agent, and clean surfaces of laitance, coatings, loose particles, and foreign matter.
1. Roughen surfaces to expose bonded aggregate uniformly; leave no laitance, loose particles of aggregate, or damaged concrete at surface.
 2. Bond fresh concrete to new concrete that has set but is not fully cured, as follows:
 - a. At joints between footings and walls or columns, and between walls or columns and beams or slabs they support, and elsewhere unless otherwise specified, dampen, but do not saturate, roughened and cleaned surface of set concrete immediately before placing fresh concrete.
 - b. At joints in exposed work, at vertical joints in walls, at joints in girders, beams, supported slabs and other structural members, and at joints designed to contain liquids, apply a commercial bonding agent or neat cement grout to roughened and cleaned surface of set concrete.
 1. Apply commercial bonding agent in accordance with the manufacturer's printed instructions.
 2. Apply neat cement grout, consisting of equal parts of portland cement and aggregate mixed with water to consistency of thick cream, to dampened concrete surfaces with stiff brush to minimum thickness of 1/16 inch. Deposit fresh concrete before grout has attained its initial set.
 3. Bond fresh concrete to fully cured hardened concrete or existing concrete. Before depositing fresh concrete, thoroughly roughen and clean hardened surfaces.
 4. Bond curbs and equipment pads to base slabs with bonding agent in accordance with manufacturer's directions.
 5. Topping Slab: Prior to placement of metallic floor topping, the base slab shall be cleaned, dampened, and bonding compound or epoxy adhesive applied. Place topping mix after the rewettable bonding compound has dried or while the polymer bonding compound or epoxy adhesive is still tacky.
- B. Cold Weather Placing: Protect concrete work from damage or reduced strength caused by frost, or low temperatures, in compliance with the requirements of ACI 306, and as specified.

**SECTION 03 05 00
COMMON WORK FOR CONCRETE**

1. When air temperature has fallen to or is expected to fall below 40 deg. F., uniformly heat water and aggregates before mixing to obtain a concrete placement temperature of not less than 50 deg. F. and not more than 80 deg, F.
 2. Verify that forms, reinforcing steel, and adjacent concrete surfaces are free of frost, before placing concrete.
 3. Only the specified non-corrosive non-chloride accelerator shall be used. Calcium chloride, thiocyanates or admixtures containing more than 0.05-percent chloride ions are not permitted.
- C. Hot Weather Placing: When hot weather conditions exist that would impair quality and strength of concrete, place in compliance with ACI 305, and as specified.
1. Cool ingredients before mixing to maintain concrete placement temperature below 90 deg. F. Mixing water may be chilled, or chopped ice may be used provided water equivalent of ice is calculated to total amount of mixing water.
 2. Cover reinforcing steel with water soaked burlap so that steel temperature will not exceed ambient air temperature immediately before embedment in concrete.
 3. Fog spray forms, reinforcing steel and subgrade just prior to placing concrete.
 4. Use water reducing retarding admixture when required by high temperatures, low humidity, or other adverse placing conditions.
- D. In case of rain or inclement weather, freshly poured concrete shall be protected against infiltration of external water. Placing shall be terminated against nearest construction joint bulkhead and covered at once with tarpaulins or similar waterproof protection until concrete has set.

END OF SECTION

PART 1 GENERAL

1.1 DESCRIPTION

- A. This Section describes the requirements for providing concrete formwork, shoring and reshoring for cast in place concrete, and installation of items furnished by others, including anchor bolts, setting plates, bearing plates, anchorages, inserts, frames, nosings and other items to be embedded in concrete.
- B. Related Sections:
 - 1. Division 1 – General Requirements
 - 2. Division 3 - Concrete

1.2 QUALITY ASSURANCE

- A. Allowable Tolerances: Design, construct, set, and maintain the formwork to ensure completed work meets the suggested tolerance limits specified in ACI 347.
- B. Placement:
 - 1. Before placement, check lines and levels of erected formwork. Make corrections and adjustments to ensure proper size and location of concrete members and stability of forming systems.
 - 2. During placement, check formwork and related supports to ensure that forms are not displaced and that completed work will be within specified tolerances.

PART 2 PRODUCTS

2.1 FORM MATERIALS

- A. Forms for Exposed Finish Concrete: Plywood, metal, metal framed, plywood faced or other panel type materials providing as cast surfaces
 - 1. Furnish in largest sizes to minimize number of joints and to conform to joint system shown on drawings.
 - 2. Provide form material with sufficient thickness to withstand pressure of placed concrete without bow or deflection beyond allowable tolerances.
 - 3. Plywood: APA grade B-B Plyform Class 1, not less than 5/8 inch thick; solid one side, sound undamaged sheets with straight edges.
- B. Earth Forms: Unless otherwise indicated or required, concrete for footings may be placed directly against vertical excavated surfaces, provided the material will stand without caving, that minimum reinforcing steel clearances indicated are maintained, and suitable provisions are taken to prevent raveling of top edges or sloughing of loose material from walls of excavation. Sides of excavation shall be made with a neat cut and the width made as indicated. Concrete, which is exposed to view on the exterior, shall be formed to a minimum depth of 6 inches below finished grade.
- C. Lumber: Douglas Fir species; No. 1 or No. 2 grade with grade stamp clearly visible

- D. Forms for Textured Finish Concrete: Special forming materials to produce surfaces with face design, arrangement, and configuration shown or required to meet Architect's control sample. Provide solid backing and form supports to ensure stability of textured form liners.
- E. Corrugated Steel Forms: Fabricate of galvanized steel sheets. Metal gauge not less than 20 gauge unless heavier gauge required, or as indicated.
- F. Cylindrical Forms:
 - 1. Heavy glass fiber reinforced plastic or galvanized steel sheets.
 - 2. Butt sections together, with bolted or keyed joints.
 - 3. Finish interior joints of forms smooth so there is no visible seam on finished concrete surfaces.
- G. Form Ties: Factory fabricated, adjustable length cone type, removable or snap off metal form ties, designed to prevent deflection, and to prevent spalling concrete surfaces upon removal.
 - 1. Unless otherwise shown, provide ties so that portion remaining within concrete after removal of exterior parts is 1 inch from outer concrete surface.
 - 2. Unless otherwise indicated, provide form ties, which will leave a hole not larger than 1 inch diameter in concrete surface.
 - 3. Form ties fabricated on project site and wire ties are not acceptable.
- H. Form Release Agent: Commercial formulation release agent that will not bond with, stain, nor adversely affect concrete surfaces; will not impair subsequent treatment of concrete surfaces requiring bond or adhesion, nor impede wetting of surfaces to be cured with water or curing compounds. Form release agent shall be VOC compliant.
- I. Inserts: Metal inserts for anchorage of materials or equipment to concrete construction, not supplied by other trades and required for work.
 - 1. Adjustable wedge inserts of malleable cast iron, complete with bolts, nuts and washers; 3/4 inches bolt size unless otherwise indicated.
 - 2. Threaded inserts of malleable cast iron, furnished complete with full depth bolts; 3/4 inch bolt size, unless otherwise indicated.
 - 3. Sheet metal reglets formed of same type and gauge as flashing metal to be built into reglets, unless otherwise indicated. Fill reglet or cover face opening to prevent intrusion of concrete or debris.
- J. Fillets for chamfered corners: wood strips 3/4 inch by 3/4 inch; maximum possible lengths.

2.2 DESIGN OF FORMWORK

- A. Design, erect, support, brace and maintain formwork so that it will safely support vertical and lateral loads, until such loads can be supported by concrete structure.

1. Carry vertical and lateral loads to ground by formwork system and in place construction that has attained adequate strength.
 2. Design forms and falsework to include assumed values of live load, dead load, weight of moving equipment operated on formwork, ambient temperature, foundation pressures, stresses, lateral stability, and other factors pertinent to safety of the structure during construction.
 3. Design formwork to be removable without impact, shock or damage to cast in place concrete surfaces and adjacent materials.
- B. Fabricate formwork to prevent leakage of cement paste during concrete placement. Solidly butt joints and provide backup material as required to prevent leakage and fins.

PART 3 EXECUTION

3.1 FORM CONSTRUCTION

- A. General:
1. Construct forms to sizes, shapes, lines and dimensions shown and required to obtain accurate location, grades, level and plumb work. Construct and erect forms in accordance with ACI 301 and ACI 347.
 2. Provide for openings, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required.
 3. Select materials to obtain required finishes.
- B. Fabricate forms for easy removal without hammering or prying against concrete surfaces.
1. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces.
 2. Provide top forms for inclined surfaces where slope is too steep to place concrete.
 3. Kerf wood inserts for forming keyways, reglets, and recesses, to prevent swelling and allow easy removal.
- C. Provide temporary openings where interior area of formwork is inaccessible for cleanout, inspection before concrete placement, and placement of concrete.
1. Brace temporary closures and set tightly to forms to prevent loss of concrete mortar.
 2. Locate temporary openings on forms in as inconspicuous location as possible.
 3. Form intersecting planes to provide true, clean cut corners, with edge grain of plywood not exposed as form for concrete.
- D. Falsework: Erect falsework and support, brace, and maintain to safely support loads applied until such loads can be supported by in place concrete structures.

**SECTION 03 11 00
CONCRETE FORMWORK**

- E. Provide shores and struts with positive means of adjustment capable of taking up formwork settlement during concrete placing, using wedges or jacks or a combination thereof. Provide trussed supports when adequate foundations for shores and struts cannot be secured.
- F. Support form facing materials with structural members spaced to prevent deflection.
 - 1. Provide camber in formwork as required for anticipated deflections due to weight and pressure of fresh concrete and construction loads for longspan members without intermediate supports.
 - 2. Inspect falsework and formwork during and after concrete placement to determine abnormal deflection or signs of failure; make necessary adjustments to produce work of required dimension.
- G. Forms for Exposed Concrete:
 - 1. Drill forms to suit form ties used and to prevent leakage of concrete mortar around tie holes. Arrange form ties in a symmetrical and uniform pattern. Do not splinter forms by driving ties through improperly prepared holes.
 - 2. Do not use metal cover plates for patching holes or defects in forms.
 - 3. Provide sharp, clean corners at intersecting planes, without visible edges or offsets. Back joints with extra studs or girts to maintain true, square intersections.
 - 4. Use extra studs, walers and bracing to prevent bowing of forms between studs.
 - 5. Assemble forms so they may be readily removed without damage to exposed concrete surfaces.
 - 6. Form molding shapes, recesses and projections with smooth finish materials, and install in forms with sealed joints to prevent displacement.
- H. Corner Treatment: Form exposed corners of beams and columns to produce square, smooth, solid, unbroken lines, except as otherwise indicated.
 - 1. Form 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.
 - 2. Unexposed corners may be formed either square or chamfered.
- I. Control joints are specified in Section 03 30 00, "Cast In Place Concrete."
- J. Provisions for Other Work:
 - 1. Provide openings in formwork to accommodate work of other Sections, including those under separate contract (if any).
 - 2. Size and location of openings, recesses and chases are responsibility of Section requiring such items.

3. Accurately place and securely support items to be built into forms.
- K. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces. Remove chips, wood, sawdust, dirt and other debris just before concrete is to be placed.

3.2 FORM COATINGS

- A. Coat form contact surfaces with form release agent before reinforcement is placed.
 1. Do not allow excess material to accumulate in forms or to come into contact with reinforcement or surfaces that will be bonded to fresh concrete.
 2. Apply in compliance with manufacturer's instructions.
- B. Coat steel forms with non-staining, rust preventative release agent or otherwise protect against rusting. Rust stained steel formwork is not acceptable.

3.3 INSTALLATION OF EMBEDDED ITEMS

- A. General:
 1. Set and built into work, anchorage devices, anchor bolts and other embedded items attached to, or supported by, cast in place concrete.
 2. Use setting drawings, diagrams, templates, instructions and directions furnished by suppliers of items to be embedded or attached.
- B. Edge Forms and Screed Strips:
 1. Set edge forms or bulkheads and intermediate screed strips for slabs to obtain required elevations and contours.
 2. Provide and secure units to support types of screeds required.

3.4 REMOVAL OF FORMS

- A. General:
 1. Formwork not supporting concrete, such as sides of beams, walls, columns, and similar items may be removed after curing at not less than 50 deg. F for 24 hours after placing concrete; provided concrete is sufficiently hard to not be damaged by form removal operations and curing and protection operations are maintained.
 2. Formwork supporting weight of concrete, such as beam, slab or joist soffits, and other structural elements may not be removed until concrete has attained seventy-five percent (75%) of specified minimum 28 day compressive strength.
 3. Determine potential compressive strength of in place concrete by testing field cured specimens representative of concrete location or members, as specified in Section 03 30 00.
 4. Form facing material may be removed 4 days after placement, only if shores and other vertical supports have been arranged to permit removal without loosening or disturbing shores and supports.

3.5 RE USE OF FORMS

- A. Clean and repair surfaces of forms to be re used in work.
 - 1. Split, frayed, delaminated or otherwise damaged form facing material will not be acceptable.
 - 2. Apply new form release agent material to concrete contact surfaces as specified for new formwork.

- B. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close joints.
 - 1. Align and secure joints to avoid offsets.
 - 2. Do not use "patched" forms for exposed concrete surfaces, except as acceptable to Architect.

END OF SECTION

PART 1 GENERAL

1.1 DESCRIPTION

- A. This Section describes the requirements for providing accessories for concrete including drilled-in anchors.

1.2 RELATED WORK

- A. Division 1 – General Requirements.
- B. Division 3 – Concrete.

1.2 REFERENCES

- A. ASTM A36 – Structural Steel.
- B. ASTM A193-B7 – High Strength Structural Steel.
- C. ASTM A307 – Carbon Steel Bolts and Studs.
- D. ASTM A615 – Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
- E. ASTM B633 – Electrodeposited Coatings of Zinc on Iron and Steel.
- F. ASTM B695 – Coatings of Zinc Mechanically Deposited on Iron and Steel.
- G. ASTM C881 – Epoxy-Resin-Based Bonding Systems for Concrete.
- H. ASTM E488 – Strength of Anchors in Concrete and Masonry Elements.
- I. ASTM E1512 – Testing Bond Performance of Adhesive-Bonded Anchors.
- J. ASTM F593 – Stainless Steel Bolts, Hex Cap Screws, and Studs.
- K. ACI 318 – Building Code Requirements for Structural Concrete.
- L. ACI 355.2 – Standard for Evaluating the Performance of Post-Installed Mechanical Anchors in Concrete.
- M. ACI 355.4 – Qualification of Post-Installed Adhesive Anchors in Concrete.
- N. ICC AC01 – Acceptance Criteria for Expansion Anchors in Concrete and Masonry Elements.
- O. ICC AC58 – Acceptance Criteria for Adhesive Anchors in Masonry Elements.
- P. ICC AC60 – Acceptance Criteria for Unreinforced Masonry Anchors.
- Q. ICC AC70 – Acceptance Criteria for Powder Driver Fasteners in Concrete, Steel and Masonry Elements.
- R. ICC AC106 – Acceptance Criteria for Predrilled Fasteners (Screw Anchors) in Concrete or Masonry.

**SECTION 03 15 00
CONCRETE ACCESSORIES**

- S. ICC AC193 – Acceptance Criteria for Mechanical Anchors in Concrete Elements.
- T. ICC AC308 – Acceptance Criteria for Post-installed Adhesive Anchors in Concrete Elements.
- U. Federal Specifications A-A-1922A, A-A-1923A, A-A-55614 for Expansion and Shield-Type Anchors.

1.3 SUBMITTALS

All submittals shall be made under the provisions of Division 1 – General Requirements.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with the California Building Code Title 24, Part 2, Volume 2, Chapter 19A.
- B. Obtain materials from the same source throughout the Work.
- C. Anchors should be listed as ICC or IAPMO approved for material being installed in.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to site in manufacturer's packaging, undamaged and with installation instructions.
- B. Store materials to prevent damage or deterioration.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Drilled-In Anchors: Acceptable manufacturers for the following products are specified on the drawings. Substitutions under provisions of 01 62 00 require approval by structural engineer and a CCD approved by DSA. Contractor shall pay for CCD preparation and DSA review. Verify with the manufacturer's installation instructions and specifications for more information including hollow substrate requirements, moisture of concrete, hole size and type of bit used to drill holes.
 - 1. Expansion Anchors:
 - a. Cracked Concrete Wedge Anchors: Anchors shall be designed in accordance with ACI 318 Chapter 17, which requires anchors to be evaluated per ACI 355.2. The anchors shall also be tested in accordance with AC 193 for all mandatory and optional tests, specifically seismic and wind testing.
 - b. Wedge Anchors: Anchors shall meet the physical requirements of Federal Specification A-A-1923A, Type 4. Anchors shall have an ICC or IAPMO evaluation report and be tested in accordance with AC 01 for seismic and wind loading, combined shear and tension loads, and critical and minimum edge distance. Anchor materials include carbon steel (zinc plated or mechanically galvanized), Type 304 or 316 stainless steel complying with ASTM A493, or Type 303 stainless free-machine steel complying with ASTM A582.

**SECTION 03 15 00
CONCRETE ACCESSORIES**

- c. Sleeve Anchors: Anchors shall meet the physical requirements of Federal Specification A-A-1922A. Anchors shall have an ICC evaluation report and be tested in accordance with AC 01 for static loading and critical and minimum edge distance and spacing. Anchor materials include carbon steel with electroplated zinc finish, Type 304 stainless steel complying with ASTM A493.
 - d. Flush-Mount, Internally Threaded Shell Anchors: Anchors shall meet the physical requirements of Federal Specification A-A-55614, Type I. Anchors shall have an ICC evaluation report and be tested in accordance with AC 01 for seismic and wind loading, combined shear and tension loads, and critical and minimum edge distance and spacing. Anchor materials include carbon steel with electroplated zinc finish, Type 316 stainless steel complying with ASTM A493, or Type 303 stainless free-machine steel complying with ASTM A582.
2. Adhesive Anchors: Adhesive anchors shall consist of and insert and an adhesive formula. Inserts shall meet the requirements of ASTM A307, A36, A193-B7, or F1554 for threaded rods or ASTM A615 or A706 for reinforcing steel. For exterior conditions the threaded insert shall be galvanized per ASTM A153 or be a 300 series stainless steel with nuts and washers of the same material. Use an adhesive material meeting one of the following criteria.
- a. Epoxy Adhesives: Adhesives shall be a cartridge type, two component, solid epoxy based system dispensed and mixed through a static mixing nozzle supplied by the manufacturer. Anchors shall meet the minimum requirements of ASTM C881, have an ICC evaluation report and be tested in accordance with AC 308 for seismic and wind loading, long term creep at elevated temperatures, static loading at elevated temperatures, damp and water-filled holes, freeze-thaw conditions, and critical and minimum edge distance and spacing. Installation temperatures shall be verified with the manufacturer's instructions.
 - b. Acrylics Adhesives: Adhesive shall be a cartridge type, two component, acrylic based system dispensed and mixed through a static mixing nozzle supplied by the manufacturer. Anchors shall meet the minimum requirements of ASTM C881, have an ICC evaluation report and be tested in accordance with AC 308 for seismic and wind loading, long term creep at elevated temperatures, static loading at elevated temperatures, damp and water-filled holes, freeze-thaw conditions, and critical and minimum edge distance and spacing. Installation temperatures shall be verified with the manufacturer's instructions.
 - c. Encapsulated Adhesives: Capsule shall be a two-component, vinylester based adhesive capsule-within-a-capsule system supplied in a manufacturer's standard packaging. Capsule adhesive shall be tested in accordance with AC 308 for long term creep at elevated temperatures and critical and minimum edge distance and spacing. Installation temperatures shall be verified with the manufacturer's instructions.
3. Concrete Screw Anchors:
- a. Self-Tapping Concrete Screw Anchors: Anchors shall have 360-degree contact with the concrete surface and shall not require oversized or

**SECTION 03 15 00
CONCRETE ACCESSORIES**

undersized holes for installation. Fastener material shall be steel complying with AISI 10B21 or 15B21, heat-treated and zinc-plated, or mechanically galvanized. Anchors shall have an ICC report and be tested in accordance with AC 106 for static tension and shear loading and critical and minimum edge distance and spacing.

4. Powder Actuated Fasteners:
 - a. Fasteners shall be of drive pin and threaded stud types and be manufactured from AISI 1060 to 1065 steel with an electroplated zinc finish. The minimum yield strength shall be 90,000 psi.
 - b. Fasteners shall not be used where spalling of the concrete will occur. If spalling does occur, patch as required per Section 03 30 00.
5. Stair Nosing:
 - a. "Supergrit" 3" wide extruded aluminum Model 231BF by Wooster Products with abrasive tread filler. Provide contrasting yellow color at top and bottom steps. Black color at all other locations.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Anchors:
 1. Install all anchors per the manufacturer's instructions with the appropriate tools.
 2. Where holes are drilled for anchors, holes shall be accurately and squarely drilled and shall be cleaned per the manufacturer's instructions.
 3. The contractor shall arrange for a manufacturer's field representative to provide installation training for all products to be used, prior to commencement of work. Only trained installers shall perform post installed anchor installation. A record of training shall be kept on site and be made available to the EOR/ IOR as requested.
 4. Adhesive anchors installed in horizontal to vertically overhead orientation to support sustained tension loads shall be done by a certified adhesive anchor installer (AAI) as certified through ACI/CRSI (ACI 318 Chapter 17). Proof of current certification kept on site and be made available to the EOR/ IOR as requested.
 5. Adhesive anchors must be installed in concrete aged a minimum of 21 days (ACI 318 Chapter 17). For installations sooner than 21 days consult adhesive manufacturer.
- B. Stair Treads:
 1. Install per manufacturer's written "Guidelines".

3.2 FIELD QUALITY CONTROL

- A. Provide continuous inspection of the installation of all anchors per CBC Table 1705A.3.
- B. Pull or torque test anchors per the requirements of the CBC Section 1910A.5 and ACI 318 Chapter 17, and the tables provided on General Structural Note's sheets. Torque testing of adhesive anchors is not permitted.
- C. Load test 100% of all anchors used in a structural condition (i.e. anchors or holdown bolts). See General Structural Note's sheet for load test values.

END OF SECTION

PART 1 GENERAL

1.1 DESCRIPTION

- A. This Section describes the requirements for providing concrete reinforcement for:
 - 1. Reinforcing steel bars, welded steel wire fabric for cast-in-place concrete
 - 2. Support chairs, bolsters, and bar supports for supporting reinforcement

1.2 RELATED WORK

- A. Division 1 – General Requirements
- B. Division 3 - Concrete

1.3 REFERENCES

- A. ACI 318 – Specifications for Structural Concrete
- B. ACI 315 – Details and Detailing of Concrete Reinforcement
- C. AWS D1.4 – Structural Welding Code Reinforcing Steel
- D. ASTM A615 – Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
- E. CBC Title 24 C.C.R., Chapter 19A
- F. CRSI Manual of Standard Practice
- G. ASTM A706 – Low Alloy Deformed and Plain Bars for Concrete Reinforcement.

1.4 SUBMITTALS

All submittals shall be submitted under the provisions of Division 1 - General Requirements.

- A. Submittal No. 03 21 00 B - Mill Certificates:
 - 1. Steel producer's certificates of mill analysis, tensile and bend tests for reinforcing steel
- B. Submittal No. 03 21 00 C – Shop Drawings.
 - 1. Comply with ACI 315
 - 2. Indicate sizes, spacing and locations and quantities of reinforcing steel, bending and cutting schedules, splice locations, stirrup and tie spacing and supporting and spacing devices.

1.5 QUALITY ASSURANCE

- A. Reinforcement work shall comply with ACI 318 and ACI 315.

**SECTION 03 21 00
CONCRETE REINFORCING STEEL**

- B. Welding procedures, welding operators and welders shall be qualified in accordance with AWS D1.4. Welders whose work fails to pass inspection shall be re-qualified before proceeding with further welding.
- C. Test of Reinforcing Bars: Testing may be waived per CBC Section 1910A.2 provided that certified mill test reports are provided for each shipment of reinforcement. If no reports are provided, testing of bars will be required.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver reinforcement to Project site bundled, tagged and marked. Use metal tags indicating bar size, lengths, and other information corresponding to markings shown on shop drawings.
- B. Store materials to prevent damage and accumulation of dirt or excessive rust.

1.7 FIELD SAMPLES

- A. Provide reinforcement for field sample.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Reinforcing Bars: ASTM A615, deformed, Grade 60
- B. Bars for Welded Splices: ASTM A706, low alloy steel
- C. Steel Wire: ASTM A82-02; 16 gauge minimum
- D. Deformed Wire: ASTM A496
- E. Supports for Reinforcement: Bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcement in place
 - 1. Use wire bar type supports complying with CRSI recommendations, unless otherwise indicated. Do not use wood, brick, and other unacceptable materials.
 - 2. For slabs on grade, use supports with sand plates or horizontal runners where base material will not support chair legs.
 - 3. For exposed to view concrete surfaces, where legs of supports are in contact with forms, provide supports with:
 - a. Plastic protected legs (CRSI, Class 1)
 - b. Stainless steel protected legs (CRSI, Class 2)
 - c. Either plastic protected or stainless steel protected legs, at Contractor's option.

2.2 FABRICATION

- A. General:

**SECTION 03 21 00
CONCRETE REINFORCING STEEL**

1. Fabricate reinforcing bars to conform to required shapes and dimensions, with fabrication tolerances complying with ACI 315 and CRSI "Manual of Standard Practice".
2. Do not re-bend or straighten reinforcing.
3. Unacceptable Materials: Reinforcement with one of the following defects will not be permitted in the work:
 - a. Bar lengths, depths and bends exceeding CRSI fabrication tolerances
 - b. Bends or kinks not indicated
 - c. Bars with reduced cross section

2.3 SOURCE QUALITY CONTROL

- A. The Owner's Project Inspector or Testing Laboratory will collect mill test reports for reinforcement.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Comply with referenced codes and standards.
- B. Clean reinforcement to remove loose rust and mill scale, earth, and other materials that reduce or destroy bond with concrete.
- C. Accurately position, support and secure reinforcement against displacement by formwork, construction, or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers and hangers, as required.
- D. Place reinforcement to obtain minimum coverage for concrete protection.
- E. Ensure bar spacing meets requirements of ACI 318, except that clear distance between bars shall be 1-1/2-inches minimum.
- F. Arrange, space, and securely tie bars and bar supports together with 16 gauge wire to hold reinforcement in position during concrete placement operations. Set wire ties so twisted ends are directed away from exposed concrete surfaces.
- G. Provide sufficient numbers of supports of strength to carry reinforcing.
 1. Do not place reinforcing bars more than 2-inches beyond the last leg of continuous bar supports.
 2. Do not use supports as bases for runways for concrete conveying equipment and similar construction loads.
- H. Splices: Splice bars by lapping ends and tightly wire tying. Comply with requirements of ACI 318 for minimum lap of spliced bars.

**SECTION 03 21 00
CONCRETE REINFORCING STEEL**

- I. The Architect the Division of the State Architect shall be notified 48 hours before pouring concrete for form and steel placement inspection.

END OF SECTION

PART 1 GENERAL

1.1 DESCRIPTION

- A. This Section describes the requirements for providing cast in place concrete.

1.2 RELATED WORK

- A. Division 1 – General Requirements
- B. Division 3 - Concrete

1.3 REFERENCES

- A. ACI 301 – Specifications for Structural Concrete Buildings
- B. ASTM C33 – Concrete Aggregates
- C. ASTM C94 – Specifications for Ready-Mixed Concrete
- D. ASTM C150 – Portland Cement
- E. CBC Title 24, Part 2, C.C.R. – Chapter 19A
- F. ASTM C309 – Liquid Membrane – forming compounds for curing concrete
- G. ACI 614 – Recommended Practice for Measuring, Mixing and Placing Concrete
- H. ASTM C31 – Making and Curing Concrete Test Specimens in the Field
- I. ASTM C39 – Test Method for Compressive Strength of Cylindrical Concrete Specimens
- J. ACI 318 – Building Code Requirements for Structural Concrete
- K. ACI 305 – Hot Weather Concreting
- L. ACI 306 – Cold Weather Concreting

1.4 SUBMITTALS

All submittals shall be submitted under the provisions of Division 1 – General Requirements.

- A. Submittal No. 03 30 00 A – Mix Designs:
 - 1. Provide mix design for each class of concrete specified.
- B. Submittal No. 03 30 00 B – Laboratory Test Reports:
 - 1. Laboratory test reports for concrete.
- C. Submittal No. 03 30 00 C – Material Certificates:
 - 1. Furnish materials certificates in lieu of laboratory test reports when permitted by Architect. Material producer and Contractor certifying that each material item

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

complies with, or exceeds specified requirements should sign material certificates.

- D. Submittal No. 03 30 00D (#) – Delivery Tickets:
 - 1. Furnish copies of delivery tickets for each load of concrete delivered to site to Project Inspector. Provide information specified.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 301 and the California Building Code Title 24, Part 2, Section 1905A.
- B. Obtain materials from the same source throughout the Work.
- C. Concrete Testing:
 - 1. Owner shall employ a testing laboratory experienced in design and testing concrete materials and mixes to perform material evaluation tests.
 - 2. Materials and installed work may require testing and retesting, as directed by Architect, during progress of work.
 - a. Allow access to material stockpiles and facilities.
 - b. Testing shall be paid for by Owner. Retesting of concrete that replaces previously rejected concrete, and core testing required to establish the adequacy of in-place concrete, shall be done at Contractor's expense.
 - c. All tests as required by ACI 318 Chapter 26 and as outlined in the General Structural Notes of the construction drawing set, the DSA T&I and the CBC.

PART 2 PRODUCTS

2.1 CONCRETE MATERIALS

- A. Portland Cement: ASTM C150, Type II gray color unless otherwise approved. Use only one brand of cement for each required type throughout Project, unless otherwise approved by Architect.
- B. Normal Weight Aggregates: ASTM C33.
- C. Water: Clean, fresh and not detrimental to concrete.
- D. Admixtures: Use in compliance with manufacturer's printed instructions. Do not use admixtures which have not been incorporated and tested in accepted mixes, unless otherwise approved by Architect.
 - 1. Water Reducing Admixture: Polymer based conforming with ASTM C494.
 - 2. Water Reducing, Retarding Admixture: ASTM C494.

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CAST-IN-PLACE CONCRETE

3. High Range Water Reducing Admixture: ASTM C494, Type F or G.
4. Air Entraining Admixture: ASTM C260.
5. Non-Corrosive, Non-Chloride Accelerator: ASTM C494, Type C or E.
6. Prohibited Admixtures: Calcium chloride, thiocyanates or admixtures containing more than 0.05-percent chloride ions are not permitted.

2.2 PROPORTIONING AND DESIGN OF MIXES

- A. Where the concrete production facility can establish the uniformity of its production for concrete of similar strength and materials based on recent test data, the average strength used as a basis for determining mix design proportions shall exceed the specified design strength by the requirements of ACI 318 or ACI 301
- B. When a concrete production facility does not have field test records for calculation of standard deviation, the required average strength used as the basis for determining mix design proportions shall be at least 1000 psi greater than the specified concrete strength of less than 3000 psi concrete and 1200 psi greater than the specified compressive strength of 3000 psi or greater concrete.
- C. Mix design submission shall be accompanied by complete standard deviation analysis or trial mixture test data.
- D. Submit written reports to Architect of each proposed mix for each type of concrete at least 15 days prior to start of work. Do not begin concrete production until mixes have been reviewed and accepted.
- E. Admixtures:
 1. Concrete shall contain the specified water-reducing or water-reducing retarding admixture and/or high-range water-reducing admixture. Concrete required to be air-entrained shall contain and approved air-retraining admixture. Pumped concrete, concrete for industrial slabs, fiber concrete, architectural concrete, concrete required to be watertight, and concrete with a water-cement ratio below 0.50 shall contain the specified high-range water-reducing admixture.
 2. Use air entraining admixture in exterior concrete, unless otherwise indicated. Add at manufacturer's prescribed rate to result in concrete at the point of placement having air content as specified.
- F. Concrete Types: Concrete Strengths (all normal weight)

**SECTION 03 30 00
CAST-IN-PLACE CONCRETE**

Location	28-day Compressive Strength (f'c)	Max. Water Cement Ratio	Air Content
Footings, drilled piers, grade beams, & other below grade conc.	3000 psi	0.60	0-2%
Interior slabs on grade, walls	3000 psi	0.50	0-2%
Shade Structure	5000 psi	0.50	0-2%

- G. Slump Limits: Concrete containing the high-range water-reducing admixture shall have a maximum slump of 9-inches unless otherwise approved by the Architect. The concrete shall arrive at the Project site at a slump of 2- to 3-inches, be verified, then the high-range water-reducing admixture added to increase the slump to the approved level. All other concrete shall have a maximum slump of 4 inches for slabs and 5 inches for other members.
- H. Chloride ion content of aggregates of constituents shall be tested by the laboratory when directed by the Architect. The total chloride ion content of the mix including all constituents shall not exceed 0.06-percent or 0.10-percent or 0.15-percent chloride ions by weight of cement.
- I. Requirements for Fly Ash: Fly ash shall conform to ASTM C618, Class N or F. Fly Ash shall not exceed 15% of cement by weight, and shall not experience a loss on ignition of greater than 1%.

2.3 SOURCE QUALITY CONTROL

- A. The Owner's Testing Laboratory will provide source quality control as outlined in the General Structural Notes of the construction drawing set.

PART 3 EXECUTION

3.1 PREPARATION

- A. Pre-placement Inspection:
 - 1. Before placing concrete, inspect formwork, reinforcing steel, and items to be embedded or cast in as outlined in the General Structural Notes of the construction drawing set.
 - 2. Moisten wood forms immediately before placing concrete where form coatings are not used.
 - 3. Soil at bottom of foundation systems is subject to testing for soil bearing value by the testing laboratory as specified in Section 31 00 00, "Earthwork." Place concrete immediately after approval of excavations.

4. Coordinate installation of joint materials and moisture barriers with placement of forms and reinforcing steel.
- B. Moisture Barrier Material: Where concrete slabs are indicated to be placed over moisture barrier; spread moisture barrier over subbase with edges and ends lapped 6 inches and sealed.

3.2 CONCRETE MIXING

- A. Measurement: Materials for concrete shall be measured by weighing the aggregates and cement using equipment that is suitable, designed and constructed for this purpose. Each size of aggregate and the cement shall be weighed separately. The accuracy of measuring devices shall be such that quantities are measured to within the following percentages of the desired amount: 1-percent for cement and water, 2-percent for aggregates, 3-percent for admixtures. Mixing water and admixtures shall be measured by volume.
- B. Mixing: All concrete shall be transit mixed. Deposit concrete into final position within one-hour of introduction of mixing water.

3.3 CONCRETE PLACEMENT

- A. Notify the Architect the Division of the State Architect a minimum of 48 hours prior to commencement of concreting procedures.
- B. Placing Record: Record time and date of casting concrete in units of building; maintain record open to inspection by the Architect.
- C. General: Place concrete in compliance with ACI 301, ACI 614 and ACI 318.
 1. Deposit concrete continuously or in layers so that concrete will not be placed on concrete which has hardened sufficiently to cause formation of seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as specified. Deposit concrete as nearly as possible to its final location to avoid segregation.
 2. Concrete shall not be placed until reinforcement, pipes, conduits, or other set in items have been inspected and approved by the Architect. Concrete shall not be placed on soft or water soaked ground, in water, on frozen ground or surfaces, which are covered by frost. Wood forms shall be thoroughly wetted before concrete is placed.
 3. Screed concrete to receive other construction to proper level to avoid excessive skimming or grouting.
 4. Do not use concrete which becomes non plastic and unworkable, does not meet required quality control limits, or which has been contaminated by foreign materials.
 5. Do not re-temper concrete.
 6. Remove rejected concrete from Project site.

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CAST-IN-PLACE CONCRETE

- D. Concrete Conveying: Handle concrete from point of delivery and transfer to concrete conveying equipment and to locations of final deposit as rapidly as possible by methods to prevent segregation and loss of mix materials.
1. Provide mechanical equipment for conveying concrete to ensure continuous flow at delivery end.
 2. Provide runways for wheeled concrete conveying equipment from delivery point to locations of final deposit.
 3. Keep interior surfaces of conveying equipment, including chutes, free of hardened concrete, debris, water, snow, ice and other deleterious materials.
 4. Maximum height of fall of concrete shall be 4' 0", except when tremies, tubes or elephant trunks are used. Concrete mix with a temperature above 80 degrees F will not be accepted.
- E. Placing Concrete into Forms:
1. Deposit in forms in horizontal layers not deeper than 24 inches, in a manner to avoid inclined construction joints.
 2. Where placement consists of several layers, place each while preceding layer is still plastic to avoid cold joints.
 3. Remove temporary spreaders in forms when concrete placing has reached elevations of spreaders.
 4. Consolidate concrete by mechanical vibrating equipment supplemented by hand spading, rodding or tamping. Do not vibrate forms and reinforcing.
 5. Do not use vibrators to transport concrete inside forms.
 - a. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than the visible effectiveness of machine.
 - b. Place vibrators to rapidly penetrate at least 6 inches into preceding layer.
 - c. Do not insert vibrators into lower layers of concrete that have begun to set.
 - d. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other items without causing segregation of mix.
- F. Placing Concrete Slabs:
1. Deposit and consolidate concrete slabs in continuous operation, within limits of construction joints, until the panel or section is completed.
 2. Separate exterior slabs on fill from vertical surfaces with joint filler. Extend joint filler from bottom of slab to within 1/2 inch of finished slab surface.
 3. There shall be no variations in the concrete slab that exceed 1/8" in a 10' radius.

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CAST-IN-PLACE CONCRETE

- G. Consolidate concrete during placing operations using mechanical vibrating equipment, so that concrete is thoroughly worked around reinforcement, other embedded items, and into corners.
- H. Bring slab surfaces to correct level with a straightedge and strike off.
 - 1. Use bull floats or darbies to smooth surface, leaving it free of humps or hollows.
 - 2. Do not disturb slab surface prior to beginning finishing operations.
- I. Maintain reinforcing steel in proper position during concrete placement operations.
- J. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Architect/Engineer upon discovery.
- K. Use of additional water in mixing the concrete to promote free flow in chutes of low inclination or any other reason will not be allowed.
- L. In case of rain or inclement weather, freshly poured concrete shall be protected against infiltration of external water. Placing shall be terminated against nearest construction joint bulkhead and covered at once with tarpaulins or similar waterproof protection until concrete has set.

3.4 FINISH ON FORMED SURFACES

- A. Rough Form Finish: Provide as cast rough form finish to formed concrete surfaces concealed in finish work or by other construction, unless otherwise indicated.
 - 1. Standard rough form finish shall be the texture imparted by the form facing material used, with tie holes and defective areas repaired and patched, and fins and other projections exceeding 1/4 inch in height rubbed down or chipped off.
- B. Smooth Form Finish: Provide as cast smooth form finish for formed surfaces exposed to view, or that are covered with a coating material applied directly to concrete, or a covering material bonded to concrete such as waterproofing, damp proofing, painting, or similar system.
 - 1. Produce smooth form finish by selecting form material to impart a smooth, hard, uniform texture and arranging them orderly and symmetrically with a minimum of seams.
 - 2. Repair and patch defective areas; remove and smooth fins and other projections.

3.5 CONCRETE SURFACE REPAIRS

- A. Repair of defective concrete is subject to DSA Approval.
- B. Patch defective areas with specified proprietary patching mortar or cement mortar immediately after removal of forms, when directed by Architect.
 - 1. Cut out honeycomb, rock pockets, and voids over 1/4 inch and holes left by tie rods and bolts, down to solid concrete.
 - a. Make edges of cuts perpendicular to concrete surface.

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

- b. Before placing patching mortar, clean, dampen with water, and brush coat area to be patched with bonding agent.
 2. For exposed to view surfaces, blend white portland cement and standard portland cement so that when dry, patching mortar will match color of surrounding concrete.
 - a. Provide test areas at inconspicuous locations to verify mixture and color match before proceeding with patching.
 - b. Compact mortar in place and strike off slightly higher than surrounding surface.
- C. Repair of Formed Surfaces: Repair exposed to view formed concrete surfaces that contain defects impacting finish appearance.
 1. Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of Architect.
 2. Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets; fins and other projections on surface; and stains and other discolorations that cannot be removed by cleaning.
 3. Flush out form tie holes, fill with dry pack mortar, or precast cement plugs secured in place with bonding agent.
 4. Repair concealed formed concrete surfaces containing defects that adversely affect durability of concrete. If defects cannot be repaired, remove and replace concrete having defective surfaces.
- D. Repair of Unformed Surfaces: Test unformed surfaces, for smoothness and to verify surface plane to specified tolerances. Correct low and high areas as specified.
 1. Test unformed surfaces sloped to drain for trueness of slope, in addition to smoothness, using template having required slope. Correct high and low areas as specified.
 2. Repair finished unformed surfaces containing defects affecting durability of concrete. Surface defects include cracks in excess of 0.01 inch wide or which penetrate to reinforcement or completely through non reinforced sections regardless of width, spalling, popouts, honeycomb, rock pockets, and other conditions.
 3. Correct high areas by grinding, after concrete has cured at least 14 days.
 4. Correct low areas during, or immediately after completion of surface finishing operations by cutting out low area and replacing with fresh concrete.
 5. Repair defective areas, except random cracks and single holes not exceeding 1 inch diameter, by cutting out and replacing with fresh concrete.
 - a. Remove defective areas to sound concrete with clean, square cuts, and expose reinforcing steel with at least 3/4 inch clearance around.

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

- b. Dampen concrete surfaces in contact with patching concrete and apply bonding compound.
 - c. Mix patching concrete to produce concrete of same type or class as original adjacent concrete.
 - d. Place, compact and finish as required to blend with adjacent finished concrete.
 - e. Cure in same manner as adjacent concrete.
6. Repair isolated random cracks and single holes not over 1 inch in diameter by dry pack method.
- a. Groove top of cracks, and cut out holes to sound concrete and remove dust, dirt and loose particles.
 - b. Dampen cleaned concrete surfaces and brush with a neat cement grout coating.
 - c. Mix dry pack, consisting of 1 part portland cement to 2 1/2 parts fine aggregate passing a No. 16 mesh sieve, using only enough water required for handling and placing.
 - d. Place dry pack after bonding compound has dried.
 - e. Compact dry pack mixture in place and finish to match adjacent concrete.
 - f. Keep patched areas moist for not less than 72 hours.

END OF SECTION

PART 1 GENERAL

1.1 DESCRIPTION

- A. This Section describes the requirements for the curing of concrete.

1.2 RELATED WORK

- A. Division 1 – General Requirements
- B. Division 3 - Concrete

1.3 REFERENCES

- A. ACI 301 – Specifications for Structural Concrete Buildings
- B. ASTM C94 – Specifications for Ready-Mixed Concrete
- C. CBC Title 24, Part 2A, C.C.R. – Chapter 19A
- D. ASTM C171 –Sheet Materials for Curing Concrete
- E. ASTM C309 – Liquid Membrane-Forming compounds for Curing Concrete
- F. ACI 318 – Building Code Requirements for Structural Concrete

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 301 and ACI 318 Chapter 5.
- B. Obtain materials from the same source throughout the Work.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Absorptive Cover: Burlap cloth made from jute or kenaf, weighing approximately 9 ounces per sq. yd.
- B. Moisture Retaining Cover: Polyethylene film complying with ASTM C171.
- C. Curing Compound: VOC compliant, clear, with a drying time of 40-minutes, complying with ASTM C309, Type 1, Class B when applied at 200-square feet per gallon.

PART 3 EXECUTION

3.1 CONCRETE CURING AND PROTECTION

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
- B. Curing and Protection: Surfaces not in contact with forms.
 - 1. Curing shall be by application of the specified curing and sealing compound or by application of waterproof sheet materials conforming to ASTM C171.

**SECTION 03 39 00
CONCRETE CURING**

2. Liquid membrane-forming curing and sealing compounds shall be applied in accordance with the manufacturer's recommendations and as specified.
 3. Application of sheet materials shall be as specified.
 4. Membrane curing compound used in floor slabs receiving applied finish flooring shall be guaranteed by the manufacturer, in writing, not to impair bonding of adhesive.
 5. For slabs to receive terrazzo, bonded cementitious materials, epoxy or urethane coatings, liquid floor hardener, waterproofing, use a curing treatment of moisture-retaining covers.
 6. Apply curing compound immediately after final finishing.
 7. For curing by waterproof sheet material, the concrete shall be continually moist-cured for a minimum of 7-days. The curing process shall begin immediately after final finishing.
- C. Interior slabs and exterior slabs, sidewalks, and curbs shall be cured with clear curing and sealing compound. Maximum coverage shall be 400-sq. ft. per gal. on steel troweled surfaces and 300-sq. ft. per gal. on floated or broomed surfaces. The curing period shall be continuous for a minimum duration of 7-days when the ambient temperature exceeds 50-deg. F.
- D. Moisture Cover Curing:
1. Cover concrete surfaces with moisture retaining cover conforming to ASTM C171 for curing concrete, placed in the widest possible width, with sides and ends lapped at least 3 inches and sealed by waterproofing tape or adhesive.
 2. Repair holes or tears during curing period using cover material and waterproof tape.
- E. Liquid Membrane Curing:
1. Apply membrane forming curing compound to damp concrete surfaces as soon as possible after final finishing operations are complete, but no later than 2 hours.
 2. Apply uniformly in continuous operation by power spray or rollers in accordance with manufacturer's directions.
 3. Recoat areas which are subjected to heavy rainfall within 3 hours after initial application.
 4. Maintain continuity of coating and repair damage during curing period.
 5. Apply to horizontal surfaces when concrete is dry to touch with power spray or hair broom, in accordance with manufacturer's directions.
 6. Apply to vertical surfaces within 24 hours after forms are stripped in accordance with manufacturer's directions. Do not use where oil form coatings have been used.

**SECTION 03 39 00
CONCRETE CURING**

- F. Curing Formed Surfaces: Cure formed concrete surfaces, including undersides of beams, supported slabs and similar surfaces by moist curing with forms in place for full curing period or until forms are removed. If forms are removed, continue curing by methods specified above.
- G. Temperature of Concrete During Curing: When atmospheric temperature is 40 deg. F and below, maintain concrete temperature between 50 deg. F and 70 deg. F throughout curing period.
1. When necessary, arrange for heating, covering, insulation or housing required to maintain specified temperature and moisture conditions during the curing period.
 2. When concrete slab placements are subject to high temperatures, wind, and/or low humidity, the Architect may require the use of the evaporation retarder to minimize plastic cracking. The compound may be required to be applied one or more times during the finishing operations. The initial application shall be made after the strike-off operation.
 3. Protect concrete continuously during curing period.
 4. Maintain concrete temperature as uniformly as possible, and protect from rapid atmospheric temperature changes. Avoid temperature changes in concrete which exceed 5 deg. F. in one hour, and 50 deg. F. in 24 hour periods.
 5. Protect from Mechanical Injury: During curing period, protect concrete from load stresses, heavy shock, excessive vibration, and damage caused by rain or flowing water. Protect finished concrete surfaces from damage by subsequent construction operations.

END OF SECTION

PART 1 GENERAL

1.1 DESCRIPTION

- A. This Section describes the requirements for furnishing and installing metal fabrications made from steel shapes, plates, bars, strips, tubes, pipes and castings not a part of structural steel or specified in other Sections.

1.2 WORK INCLUDED

- A. Exterior hand rails at ramps and stairs.
- B. Rain water leaders.
- C. Cast aluminum stair nosings.

1.3 SYSTEM PERFORMANCE REQUIREMENTS

- A. Railings: Design, engineer, fabricate and install railings to withstand the following structural loads:
 - 1. Top Rail of Railing System: Capable of withstanding a concentrated load of 300-pounds applied at any point and a uniform load of 50-pounds per linear foot applied at any direction.
 - 2. Railings shall comply with Uniform Building Code requirements.

1.4 RELATED WORK

- A. Division 1 – General Requirements
- B. Division 5 - Steel

1.5 SUBMITTALS

All submittal shall be submitted under the provisions of Division 1 – General Requirements.

- A. Submittal No. 05 50 00 A – Product Data:
 - 1. Manufacturer's specifications, anchor details and installation instructions, including paint products and grout.
- B. Submittal No. 05 50 00 B - Shop Drawings:
 - 1. Include plans, elevations and details of metal fabrications and their connections. Show anchorage and accessory items.

1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: Firm experienced in successfully producing metal fabrications similar to that indicated for this Project, with sufficient production capacity to produce required units without causing delay in the work.

**SECTION 05 50 00
METAL FABRICATIONS**

- B. Welding Qualifications: Qualify welding processes and welding operators in accordance with AWS D1.1, D1.3, and D1.2 as applicable. Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved.

1.7 PROJECT CONDITIONS

- A. Field Measurements: Check actual locations of walls and other construction to which metal fabrications must fit, by accurate field measurements before fabrication. Show recorded measurements on shop drawings. Coordinate fabrication schedule to avoid delay of work.

1.8 SEQUENCING AND SCHEDULING

- A. Painting: Items specified in this Section as having a shop applied prime coat will be job painted as specified in Section 09 90 00, unless otherwise noted.
- B. Furnish templates for anchors and bolt installation by other Sections.

PART 2 PRODUCTS

2.1 MATERIALS

- A. General: For fabrication of metal work, which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness.
- B. Wide Flange Steel Shapes: ASTM A992
- C. Steel Plates, Shapes and Bars: ASTM A36
- D. Steel Tubing: Cold formed, ASTM A500; or hot rolled, ASTM A501
- E. Steel Rainwater Leaders (Downspouts).
- F. Galvanized Structural Steel Sheet: ASTM A653
- G. Steel Pipe: ASTM A53; type and grade selected by fabricator; black finish unless galvanizing is indicated or specified; standard weight, schedule 40, unless otherwise indicated
- H. Brackets, Flanges and Anchors: Cast or formed metal of same type material and finish as supported rails, unless otherwise indicated
- I. Cast Aluminum Stair nosings.
- J. Fasteners: Steel fasteners, galvanized in accordance with ASTM A153, selected by fabricator
- K. Paint: Per Section 09 90 10.

2.2 FABRICATION, GENERAL

- A. Workmanship:

**SECTION 05 50 00
METAL FABRICATIONS**

1. Use materials of size and thickness indicated or required to produce strength and durability in finished product for use intended.
 2. Work to dimensions indicated,
 3. Form exposed work true to line and level with accurate angles and surfaces and straight, sharp edges.
 4. Ease exposed edges to a radius of approximately 1/32 inch, unless otherwise indicated.
 5. Form bent metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
 6. Weld corners and seams continuously, complying with AWS recommendations. At exposed connections, grind exposed welds smooth and flush to match and blend with adjoining surfaces. Welds shall be imperceptible in the finished work.
 7. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible. Use Phillips flat head countersunk screws or bolts for exposed fasteners, unless tamperproof security screws are indicated.
 8. Cut, reinforce, drill and tap miscellaneous metal work as indicated to receive finish hardware and similar items.
- B. Galvanizing: Provide zinc coating for items indicated or specified to be galvanized, as follows:
1. ASTM A153 for galvanizing iron and steel hardware.
 2. ASTM A123 for galvanizing both fabricated and un-fabricated iron and steel products made of uncoated rolled, pressed, and forged shapes, plates, bars, and strip 0.0299-inch thick and heavier.
- C. Fabricate joints exposed to the weather to exclude water or provide weep holes.
- D. Shop Painting:
1. Shop paint miscellaneous metal work, except members or portions of members to be embedded in concrete or masonry, surfaces and edges to be field welded, and galvanized surfaces.
 2. Remove scale, rust and other deleterious materials before applying shop coat. Clean off heavy rust and loose mill scale in accordance with SSPC SP 2, SP 3, or SP 7.
 3. Remove oil, grease and similar contaminants in accordance with SP 1.
 4. Brush or spray on primer in accordance with manufacturer's instructions, at a rate of 2.0 mils thickness for each coat.

**SECTION 05 50 00
METAL FABRICATIONS**

5. Apply one shop coat to fabricated metal items, except apply 2 coats to inaccessible surfaces after assembly or erection. Change color of second coat to distinguish from the first.
6. Primer on exposed to view items to be field painted shall be smooth and suitable for application of final finish coats specified in Section 09 90 00.
7. Apply a heavy coat of bituminous paint, compounded for application in 30 mil coat, to metal surfaces in contact with concrete, masonry and dissimilar metals. Do not apply on exposed surfaces.

2.3 MISCELLANEOUS METAL FABRICATIONS

A. Steel Rainwater Leaders:

1. Fabricate to design, dimension and details indicated.
2. Steel tubing, cold formed, ASTM A500 or hot rolled, ASTM A501.
3. Flanges, fitting and anchors: Provide flanges, misc. fittings and anchors for interconnections of pipe or tubing and attachment to other work.

B. Curb Nosings:

1. Fabricated aluminum construction with mitered corners and continuously welded joints.
2. Provide anchors welded to nosings for embedding in concrete construction, spaced not more than 6-inches from each curb end, 6-inches from corners and 24-inches on center unless otherwise indicated.
3. Finish: Cast Aluminum.

C. Steel Pipe or Tube Railings: Fabricate to design, dimensions and details indicated.

1. Interconnect railing members by butt welding or welding with internal connectors.
2. Provide coped joints at tee and cross sections.
3. Form simple and compound curves by bending pipe or tubing in jigs to produce uniform curvature for each repetitive configuration. Maintain cylindrical cross section of pipe or tube throughout entire bend without buckling, twisting or deforming exposed surfaces.
4. Close exposed ends of pipe by welding 3/16 inch steel plate in place or by using prefabricated fittings.
5. Flanges, Fittings and Anchors: Provide end closures, flanges, miscellaneous fittings and anchors for interconnections of pipe or tubing and attachment of railings to other work. Furnish inserts and other anchorage devices for connecting to concrete or masonry.
6. Pipe Sleeves:

**SECTION 05 50 00
METAL FABRICATIONS**

- a. Provide galvanized pipe sleeves not less than 6 inches long with an inside diameter not less than 1/2 inch greater than the outside diameter of pipe or tube.
 - b. Provide steel plate closure welded to bottom of sleeve, width and length not less than 1 inch greater than outside diameter of sleeve.
 - c. Provide friction fit, removable covers designed to keep sleeves clean and hold top edge of sleeve 1/2 inch below finished surface of concrete.
- D. Interior Steel Railings:
1. Fabricate to design, dimensions and details as indicated in sections and details.
 2. Provide steel brackets welded to handrails at intervals throughout stairwell as required to support handrails with fasteners sufficient to
 3. Form simple and compound curves by bending pipe or tubing in jigs to produce uniform curvature for each repetitive configuration. Maintain cylindrical cross section of pipe or tube throughout entire bend without buckling, twisting or deforming exposed surfaces.
 4. Interconnect railing members by butt welding or welding with internal connectors.
 5. Provide black steel pipe or tubing for interior railings, shop primed.

PART 3 EXECUTION

3.1 PREPARATION

- A. Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, such as concrete inserts, sleeves, anchor bolts and miscellaneous items having integral anchors.

3.2 INSTALLATION

A. General:

1. Fastening to In Place Construction: Provide threaded fasteners for concrete and masonry inserts, toggle bolts, through bolts, lag bolts, wood screws and other connectors as required
2. Cutting, Fitting and Placement:
 - a. Perform cutting, drilling and fitting required for installation of miscellaneous metal fabrications.
 - b. Set work accurately in location, alignment and elevation, plumb, level, true and free of rack, measured from established lines and levels.

3. Fit exposed connections together forming tight hairline joints.
 - a. Weld connections not shop welded.
 - b. Grind exposed joints smooth and imperceptible, and touch up shop paint coat.
 - c. Do not weld, cut or abrade the surfaces of exterior units which have been hot dip galvanized after fabrication, and intended for bolted or screwed field connections.
 4. Field Welding: Comply with AWS for procedures of manual shielded metal arc welding, appearance and quality of welds, and methods used in correcting welding work.
 5. Install prefabricated items in accordance with manufacturer's instructions.
- B. Steel Pipe or Tube Railings:
1. Adjust railings prior to anchoring to ensure matching alignment at abutting joints.
 2. Space posts as indicated and plumb posts in each direction.
 3. Anchor posts in concrete with pipe sleeves preset and anchored into concrete. After posts are inserted in sleeves, fill annular space between post and sleeve solid with non-shrink, non-metallic grout mixed and placed to comply with grout manufacturer's directions.
 4. Anchor posts to steel with steel oval flanges, angle type or floor type as required by conditions, welded to posts and bolted to steel supporting members.
 5. Expansion Joints: Provide at intervals not exceeding 40 feet. Provide slip joint with internal sleeve extending 2 inches beyond joint on either side; fasten internal sleeve securely to one side; locate joint within 6 inches of posts.

3.3 ADJUST AND CLEAN

- A. Touch-Up Painting: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material used for shop painting. Apply by brush or spray to provide a minimum dry film thickness of 2.0 mils.
- B. Galvanized Surfaces: Clean field welds, bolted connections and abraded areas and spot prime with specified primer applied to a minimum dry film thickness of 2.5 mils.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
1. Steel pipe and tube railings.

1.2 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide railings capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Handrails:
 - a. Uniform load of 50 lbf/ ft. applied in any direction.
 - b. Concentrated load of 200 lbf applied in any direction.
 - c. Uniform and concentrated loads need not be assumed to act concurrently.
2. Top Rails of Guards:
 - a. Uniform load of 50 lbf/ ft. applied in any direction.
 - b. Concentrated load of 200 lbf applied in any direction.
 - c. Uniform and concentrated loads need not be assumed to act concurrently.
3. Infill of Guards:
 - a. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft.
 - b. Uniform load of 25 lbf/sq. ft. applied horizontally.
 - c. Infill load and other loads need not be assumed to act concurrently.

- B. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1.3 SUBMITTALS

- A. Submittal No. 05 52 13 A - Product Data: For mechanically connected railings, grout, anchoring cement, and paint products.
- B. Submittal No. 05 52 13 B - Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
1. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- C. Submittal No. 05 52 13 C - Samples: For each exposed finish required.
- D. Submittal No. 05 52 13 D - Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, according to ASTM E 894 and ASTM E 935.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Steel Pipe and Tube Railings:
 - a. Pisor Industries, Inc.
 - b. Sharpe Products.
 - c. Wagner, R & B, Inc.; a division of the Wagner Companies.

2.2 METALS

- A. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails, unless otherwise indicated.
- B. Aluminum: Provide alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with not less than the strength and durability properties of alloy and temper designated below for each aluminum form required.
 - 1. Extruded Tubing: ASTM B 221 Alloy 6063-T5/T52.
 - 2. Extruded Structural Pipe and Round Tubing: ASTM B 429, Alloy 6063-T6.
 - 3. Drawn Seamless Tubing: ASTM B 210, Alloy 6063-T832.
 - 4. Plate and Sheet: ASTM B 209, Alloy 6061-T6.
 - 5. Die and Hand Forgings: ASTM B 247, Alloy 6061-T6.
 - 6. Castings: ASTM B 26/B 26M, Alloy A356.0-T6.
 - 7. Woven-Wire Mesh: Intermediate-crimp, 2-inch woven-wire mesh, made from 0.162-inch nominal diameter wire complying with ASTM B 211, Alloy 6061-T94.
- C. Steel and Iron:
 - 1. Tubing: ASTM A 500 cold formed.
 - 2. Pipe: ASTM A 53/A 53M, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.
 - 3. Plates, Shapes, and Bars: ASTM A 36/A 36M.
 - 4. Castings: Either gray or malleable iron, unless otherwise indicated.
 - a. Gray Iron: ASTM A 48/A 48M, Class 30, unless another class is indicated or required by structural loads.
 - b. Malleable Iron: ASTM A 47/A 47M.

2.3 MISCELLANEOUS MATERIALS

- A. Fasteners: Provide concealed fasteners, unless unavoidable or standard for railings indicated.
 - 1. Steel Railings: Plated steel fasteners complying with ASTM B 633, Class Fe/Zn 25 for electrodeposited zinc coating.

**SECTION 05 52 13
PIPE AND TUBE RAILINGS**

- B. Anchors: Provide anchors, fabricated from corrosion-resistant materials with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and equal to four times the load imposed when installed in concrete, as determined by testing per ASTM E 488.
- C. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
- D. Shop Primers: Provide primers that comply with Division 09.
- E. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79.
- F. Zinc-Rich Primer: Complying with SSPC-Paint 20 or SSPC-Paint 29 and compatible with topcoat.
- G. Shop Primer for Galvanized Steel: Zinc-dust, zinc-oxide primer compatible with finish paint systems indicated, and complying with SSPC-Paint 5.
- H. Grout and Anchoring Cement: Factory-packaged, nonshrink, nonmetallic grout complying with ASTM C 1107; or water-resistant, nonshrink anchoring cement; recommended by manufacturer for exterior use.

2.4 FABRICATION

- A. General: Fabricate railings to comply with design, dimensions, and details indicated.
- B. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
- C. Welded Connections for Aluminum Pipe: Fabricate railings to interconnect members with concealed internal welds, using manufacturer's standard system of sleeve and socket fittings.
- D. Non-welded Connections: Connect members with concealed mechanical fasteners and fittings.
- E. Form changes in direction by bending or by inserting prefabricated elbow fittings as detailed.
- F. Form curves by bending in jigs to produce uniform curvature; maintain cross section of member throughout bend without cracking or otherwise deforming exposed surfaces.
- G. Close exposed ends of railing members with prefabricated end fittings.
- H. Provide wall returns at ends of wall-mounted handrails, unless otherwise indicated.
- I. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work, unless otherwise indicated.

2.5 FINISHES

- 1. Powder-Coat Finish: Paint new pipe rails per Section 09 90 10.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation.
 - 1. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
 - 2. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.
- B. Coat concealed surfaces of aluminum that will be in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.
- C. Anchor railing ends to concrete with round flanges connected to railing ends and anchored to wall construction with anchors and bolts.
- D. Attach handrails to wall with wall brackets.
 - 1. Use type of bracket with flange tapped for concealed anchorage to threaded hanger bolt.
 - 2. For wood stud partitions, use hanger or lag bolts set into wood backing between studs.
- E. Adjusting and Cleaning:
 - 1. Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop painting.
 - 2. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION

PART 1 GENERAL

1.1 WORK INCLUDED

- A. Structural and non-structural framing and sheathing.
- B. Miscellaneous concealed and exterior lumber and sheet materials as shown or required.
- C. Roof curbs and cants.
- D. Blocking in wall and roof openings.
- E. Concealed wood blocking for support of washroom accessories and wall cabinets.
- F. Wood Blocking.
- G. Treatment of wood members where required.

1.2 RELATED WORK

- A. Division 1 - General Requirements
- B. Division 6 - Wood, Plastics and Composites

1.3 REFERENCE STANDARDS

- A. NFPA National Design Specification of Stress-Grade Lumber and its Fastening.
- B. WCLIB - West Coast Lumber Inspection Bureau: Standard Grading Rules for West Coast Lumber.
- C. WWPA - Western Wood Products Association.
- D. ASTM E84 - Fire Test.
- E. FS TT-W-571 - Wood Preservation: Treating Practices.
- F. California Building Code Title 24, Chapter 23.
- G. AWPA - American Wood Preservers' Association: Book of Standards.
- H. FS FF-N-105B – Common Wire Nails.
- I. National Design Specification

1.4 QUALITY ASSURANCE

- A. Lumber to have visible grade stamp of an agency certified by AF & PA.
- B. Provide written certification stating that materials provided meet specified requirements, including but not limited to their compliance with referenced standards relative to:
 - 1. Grade mark for the use intended

- 2. Preservative treatment
- 3. Fire retardant treatment

1.5 DELIVERY, STORAGE AND HANDLING

- A. Protect materials from weather while in transit. Place under cover and protect from weather immediately upon delivery.
- B. Store flat, off the floor, in well ventilated area where there will be no great variations in heat and humidity.
- C. All pieces of lumber shall be grade stamped with WCLIB or WWPA grade stamp.

1.6 WARRANTY

- A. Warrant the Work specified herein for two (2) years against becoming unserviceable or causing an objectionable appearance resulting from defects in materials and workmanship.
- B. Warrant that products comply with the Contract Documents and local use restrictions, and are compatible with adjoining materials, substrates and other conditions of installation.
- C. Defects shall include, but not be limited to:
 - 1. Buckling or warping of surfaces
 - 2. Loose or missing parts
 - 3. Faulty installation, attachment or alignment
 - 4. Deterioration due to lack or loss of preservative treatment

PART 2 PRODUCTS

2.1 LUMBER

- A. Lumber Species and Materials: Framing Lumber: Shall be Douglas Fir - Larch, unless noted otherwise, and shall comply with the grading rules of WWPA or WCLIB. All lumber shall be stamped as to grade by an approved grading agency. End jointed lumber shall not be used. All structural wood members with the least dimension 2 1/2" or greater shall be free of heart center. All sides surfaced. Grades as follows unless otherwise noted on Drawings:

	USE Grade	Max moisture content at time of installation
1 inch boards	"Construction"	19%
Beams & Headers	No. 1	19%
Roof & Ceiling Joists	No. 1	19%
Studs, Sills, Plates	No. 1	19%
Posts & Timbers	No. 1	19%
Miscellaneous Blocking, & Framing not noted	No. 1	19%

- B. Preservative Treated Wood Materials: Pressure-treated in accordance with Standard Specifications of AWPA for treating structural timbers and FS TT-W-571.

2.2 ACCESSORIES

- A. Furnish and install all connecting hardware indicated on Drawings, specified herein or required to complete the work.
- B. Materials:
 - 1. Nails, Screws, Bolts and Fasteners: Hot-dipped galvanized steel for exterior, high humidity, and treated wood locations; plain finish elsewhere; size and type to suit condition.
 - 2. Nails for light gauge metal connectors: Common wire nails, sizes as indicated or as specified by metal connector manufacturer
 - 3. Screws: Standard domestic manufacturer, bright steel. Galvanized for exterior use. Brass, bronze, aluminum or stainless when used to fasten items made of those metals.
 - 4. Screws: For attaching interior trim and finish to drywall partitions, use Type S, self drilling, self tapping anodized steel drywall screws of indicated lengths
 - 5. Bolts: ASTM A307 machine bolts with standard hex nuts and steel plate or cut washers or carriage bolts with standard hex nuts and cut washers as indicated. Bolts, nuts and washers wholly or partially exposed on exterior shall be galvanized. Sill plate anchor bolts shall use 3" x 3" x 0.229" Plate Washers.
 - 6. Steel Plates and Angles: ASTM A36
 - 7. Lag Screws, Shear Plates, and Split Ring Connectors: As per American Forest & Paper Association "National Design Specifications for Wood construction".
 - 8. Framing Anchors, Joist Hangers, Etc: As made by Simpson Company and indicated on drawings, or equivalent devices as approved by Architect and DSA. All framing connectors and joist hangers in contact with preservative-treated wood shall be coated to meet the requirements of CBC Section 2304.10.5.1. Connectors in contact with preservative-treated wood should have a minimum coating meeting the connector manufacturer's recommendations based upon the type of preservative treatment used. At outdoor installations, in the absence of manufacturer's recommendations, the connectors in contact with preservative-treated wood shall have a minimum coating meeting ASTM A653, type G185 per the CBC.
 - 9. Power Driven Inserts: "Hilti" or as approved by Architect and DSA; install as per manufacturer's directions.
 - 10. Miscellaneous Clips, Steel Assemblies: As per ASTM A36.
 - 11. Provide drilled anchors (i.e. Hilti Kwik Bolt TZ) as indicated on plan in concrete. Pull or torque test as indicated on DSA structural test and inspection form and per table in General Structural Notes of construction drawing set.

2.3 BUILDING PAPER

- A. Two (2) layers 15 lb. felt

PART 3 EXECUTION

3.1 SITE TREATMENT

- A. Field apply a compatible preservative or fire-retardant treatment, as applicable, to site-sawn ends of treated members in accordance with manufacturer's recommendations. Allow treatment to cure prior to placing members.
- B. Locations requiring preservative treatment:
 - 1. Sill Plates for wood framing in contact with concrete or masonry.
 - 2. Blocking or grounds in contact with concrete or masonry.
 - 3. Blocking or grounds concealed in construction in such a manner as to prevent exposure to circulating air.
- C. Locations requiring fire retardant treatment:
 - 1. Concealed backing and blocking within partition or ceiling construction.
 - 2. Other interior locations as shown or required by code.

3.2 SELECTION AND USE OF LUMBER

- A. Examine each piece of lumber separately. Select for strength, warp and appearance, using the best pieces for the most demanding purposes.
- B. Discard inferior portions of members where shorter pieces are required.

3.3 INSTALLATION

- A. Execute carpentry Work carefully with neat cuts and close joints. Fit members to give firm seating and bearing.
- B. Place members true to lines and levels. Secure rigidly in place.
- C. Construct continuous members with pieces of longest possible lengths.
- D. Install members where indicated or needed to provide proper nailing, furring or bracing. Provide all blocking as required to hold Work in proper position.
- E. Bore bolt holes only slightly larger than size of bolts. Provide washers for all bolts where heads or nuts bear on wood. Where required, countersink heads, nuts and washers.
- F. Plywood Sheathing: install plywood roof sheathing and sub flooring with long dimension perpendicular to joints.
- G. Fire Blocking: provide in accordance with CBC Section 708.

3.4 FRAMING

- A. General: Install all wood framing making proper provisions for work of other trades. Do all cutting of wood required to accommodate plumbing, heating and ventilating, electrical and other trades. Fit neatly around all exposed items such as outlet boxes, conduit, pipes and ducts.
- B. Exterior Base Plates or Bearing or Sheathed Wall Sills Resting on Concrete: Bed in cement mortar to obtain a continuous bearing as necessary. Mortar shall consist of one part cement to three parts sand. Mix mortar in small quantities so it can be used promptly. Size all plates or sills and set level true to line. Bolt down with bolts of size, length and spacing indicated, with a bolt not more than nine inches from the end of any piece. Each piece shall receive at least two bolts.
- C. Rough Framing: Fit closely; set accurately to required lines and levels and secure rigidly in place. Set horizontal and inclined members with crown edge up. Do not cut, notch, or bore structural members without specific approval. Reinforce cut members as directed. Bolt, nail and spike thoroughly with not less than sizes and quantities indicated. Structural members shall provide full contact at all bearing surfaces. Joists shall be spliced over bearings unless shown otherwise.
- D. Studs: Make walls and partitions of nominal 2x4, 2x6, 4x6, 2x8, or 4x8 studs, 16 inches on center, unless otherwise indicated or required to be larger to accommodate mechanical or electrical equipment, piping, and fixtures or the fixtures or equipment of any other trade. Unless otherwise indicated, all panels, valve covers, cleanouts, devices, access doors, recessed cabinet boxes, etc. shall be mounted flush with the adjacent wall surface. When any such item is of a depth where it is not practical to use solid studding to the full thickness of the wall, the wall shall be furred. When furring is required, it shall extend the full width of the room on the wall in which it occurs and from floor to roof or ceiling joists. The studs comprising all interior partitions and the wall material affixed to them shall extend from floor to ceiling joist framing except as otherwise indicated. Staggered stud walls shall be constructed where indicated on drawings.
- E. Top Plates in Bearing Partitions: shall be doubled and lapped at each intersection with walls or partitions. Stagger joints in upper and lower members of top plate not less than 4 feet and splice as shown.
- F. Provide blocking not less than 2 inches in thickness of same width as studs as shown on drawings. Also install all fire stopping as required by Section 708 of the California Building Code.
- G. Frame corners solid where stud walls or partitions meet, or as indicated on drawings.
- H. Retighten anchor bolts before closing in.

3.5 WOOD BACKING AND NAILING STRIPS

- A. Provide all wood backing, furring or blocking indicated or required for proper installation and attachment or work of other trades. Form lumber, which has been cleaned and is in sound conditions, may be used, unless other material is indicated.
- B. Provide wood stripping where indicated for attachment of finish materials to wood or concrete surfaces

3.6 TOLERANCES

- A. Framing Members: 1/4 inch maximum from true position.
- B. Surface Flatness of Floor: 1/4 inch in 10 feet maximum.

3.7 CLEANUP

- A. Upon completion of installation activity, remove all waste, sawdust, dirt, wrappings and excess materials, tools and equipment. Thoroughly clean all surfaces to the satisfaction of the Architect.

END OF SECTION

PART 1 GENERAL

1.1 WORK INCLUDED

- A. Includes but not limited to:
 - 1. Wall sheathing
 - 2. Roof and floor sheathing

1.2 RELATED WORK

- A. Division 1 - General Requirements
- B. Division 6 - Wood, Plastics and Composites

1.3 REFERENCES

- A. Title 24 C.C.R. CBC, Chapter 23
- B. PS-1 - Construction and Industrial Plywood
- C. PS-2 – Performance Standard for Wood-Based Structural Panels
- D. APA - American Plywood Association
- E. ASTM F1667 – Common Wire Nails
- F. National Design Specification

1.4 QUALITY ASSURANCE

- A. Grading Agency: Certified by APA

1.5 REGULATORY REQUIREMENTS

- A. Conform to the California Building Code, Chapter 23

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store and protect products under provisions of Section 01 66 00
- B. All pieces of sheathing shall be stamped with grade stamp

PART 2 PRODUCTS

2.1 STRUCTURAL SHEATHING:

- A. Sheathing shall conform to the requirements of U.S. Product Standard PS 1 or PS 2. Each piece shall be clearly and legibly grade marked with established symbols of the American Plywood Association. Grades shall be as shown on the Drawings. Exterior glue required.

2.2 CONNECTING HARDWARE:

- A. Furnish and install all connecting hardware indicated on Drawings, specified herein or required to complete the work.
- B. Materials:
 - 1. Nails for wood-to-wood connections for attachment of sheathing: Common wire nails u.o.n., galvanized for exterior work and pressure treated wood.

PART 3 EXECUTION

3.1 FRAMING

- A. General: Install all wood framing making proper provisions for work of other trades. Do all cutting of wood required to accommodate plumbing, heating and ventilating, electrical and other trades. Fit neatly around all exposed items such as outlet boxes, conduit, pipes and ducts.
- B. Sheathing: Install roof sheathing and subflooring with long dimension perpendicular to joists. Install wall sheathing with long dimensions vertical. Sheathing shall have edges blocked and butted tightly and nailed for diaphragm or shear wall stresses as indicated on drawings. Sheathing panels in non-shear walls shall be spaced with a gap of 1/8" where installed under cement plaster finish. All sheathing shall be laid with the best face on exposed side. Stagger joints if more than one layer is indicated. Machine nailing is subject to satisfactory jobsite performance.
- C. Provide blocking not less than 2 inches in thickness of same width as studs as shown on drawings. Also install all fire stopping as required by Section 708 of the California Building Code.

3.2 SHEATHING

- A. Secure wall sheathing horizontally perpendicular to wall studs, with ends staggered over firm bearing. Provide solid blocking between sheathing.
- B. Secure roof sheathing perpendicular to framing members with ends staggered. Secure sheet edges over firm bearing. Provide solid blocking between sheathing where noted.

3.3 TOLERANCES

- A. Framing Members: 1/4 inch maximum from true position
- B. Surface Flatness of Floor: 1/4 inch in 10 feet maximum

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Finish carpentry items, other than shop-prefabricated casework, with accessories as required for complete installation.
 - 1. Window trims, sills, chair rails and other wood trims.
 - 2. Exterior fascias and trims .

1.2 SUBMITTALS

All submittals shall be submitted under the provisions of Section 01 33 00.

- A. Submittal No. 06 20 00 A - Product Data: Submit literature for manufactured items.
- B. Submittal No. 06 20 00 B - Shop Drawings: Indicate materials and wood species, component profiles, fastening, joining details, finishes, and accessories to a minimum scale of 1-1/2 inch to one foot.
- C. Submittal No. 06 20 00 C - Samples: Furnish samples of each type of finish carpentry, 12" long min.

1.3 QUALITY ASSURANCE

- A. Standards: Perform finish carpentry in accordance with standards of Woodwork Institute (formerly Woodwork Institute of California) "Manual of Millwork."

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver materials until site conditions are adequate to receive work; protect items from weather while in transit.
- B. Store materials indoors, in ventilated areas with constant but minimum temperature of 60 degrees F and maximum relative humidity of 25% to 55%.
- C. Do not begin installation of finish carpentry until space is fully enclosed and mechanical systems are fully operational.
 - 1. Maintain interior installation areas at 70 degrees F and 50% to 55% relative humidity.
- D. Immediately remove from site materials with visible mold and materials with mildew.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Lumber: DOC PS 20 and applicable grading rules of inspection agencies certified by ALSC's Board of Review.
- B. Softwood Plywood: DOC PS 1.
- C. Hardboard: AHA A135.4.
- D. MDF: ANSI A208.2, Grade 130, made with binder containing no urea-formaldehyde resin.
- E. Lumber for Shimming, Blocking, and Backing: No. 2 Douglas Fir.
- F. Anchors, Nails and Screws: Select the material, type, size and finish required by each substrate for secure anchorage; provide toothed steel or lead expansion bolt screws for drilled-in-place anchors.
- G. Wood Filler: Color to match wood being filled.

2.2 FABRICATION

- A. Fabricate finish carpentry items to Woodwork Institute Premium standards.
- B. Use exposed fastening devices or nails only when approved in writing by Architect and unavoidable; arrange neatly.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication where possible; do not delay job progress, allow for trimming and fitting.
- B. Verify surfaces are ready to receive work and field measurements are as shown on shop drawings.
 - 1. Beginning installation signifies acceptance of conditions.
- C. Ensure mechanical and electrical items affecting work are properly placed, complete, and have been inspected by applicable authorities prior to commencement of installation.
- D. Inspect each piece of finish carpentry and discard damaged and defective pieces.

3.2 INSTALLATION

- A. Install work consistent with specified WI MoM quality grade, plumb, level, true and straight with no distortions; shim as required, using concealed shims.
 - 1. Prime paint surfaces in contact with cementitious materials prior to installation; comply with requirements of Section 09 90 00 – Painting and Coating.

**SECTION 06 20 00
FINISH CARPENTRY**

- B. Secure work to blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation.
- C. Scribe and cut for accurate fit to other finished work.
- D. Install trim in single, unjointed lengths for openings and for runs less than 10'-0".
 - 1. For longer runs, use only one piece less than 10'-0" in any straight run; provide scarf joints between members.
 - 2. Stagger joints in adjacent members.
 - 3. Cope at returns and miter at corners.
- E. Accessories: Install accessories in accordance with manufacturer's recommendations in locations indicated or as directed by Architect.
- F. Acceptable Tolerances:
 - 1. Variation from True Position: Maximum 1/16" at any position and maximum 1/8" in any 10'-0" length.
 - 2. Adjoining Surfaces of Same Material: No variation permitted.
 - 3. Offset with Abutting Materials: Maximum 1/32".
- G. Preparation for Field Finishing:
 - 1. Sand work smooth and set exposed nails and screws.
 - 2. Apply wood filler in exposed nail and screw indentations and leave ready to receive site-applied finishes.
 - 3. Seal concealed and semi-concealed surfaces; brush apply only, using primer consistent with finish coats specified under Section 09 90 00 – Painting and Coating.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Provide mill fabricated architectural woodwork with accessories as required for complete finished installation including cabinet hardware.
 - 1. Provide cabinet hardware as shown in drawings.
 - 2. Provide plastic laminate countertops.
 - 3. Coordinate classroom sink locations with other trades.

1.2 SUBMITTALS

All submittals shall be submitted under the provisions of Section 01 33 00.

- A. Submittal No. 06 40 00 A - Product Data: Submit literature for manufactured items.
- B. Submittal No. 06 40 00 B - Product Shop Drawings:
 - 1. Include materials, dimensioned plans, elevations, and sections, fastening methods, assembly methods, joint details, accessory listings, and schedule of finishes. Provide elevations at 3/8" scale minimum and indicate plan views of all countertops. Include depths of all casework in submittal.
- C. Submittal No. 06 40 00C - Samples: Furnish samples of each exposed architectural woodwork finish on each type of specified wood, and including each exposed cabinet and display case hardware.

1.3 QUALITY ASSURANCE

- A. Fabricator Qualifications: Member of Woodwork Institute (formerly Woodwork Institute of California) with minimum five years successful experience fabricating architectural woodwork similar to that required for Project.
- B. Standards: Perform architectural woodwork in accordance with recommendations Woodwork Institute (formerly Woodwork Institute of California) "Manual of Millwork" (WI MoM).
- C. Field Sample: Provide one full size field sample of residential unit base and wall cabinet and countertop, including drawer, doors and shelves.
- D. Seismic Anchorage: Provide seismic anchorage for wall and base cabinets as required by California Code of Regulations (CCR), Title 24, Part 2.

1.4 DELIVERY, STORAGE, AND HANDLING

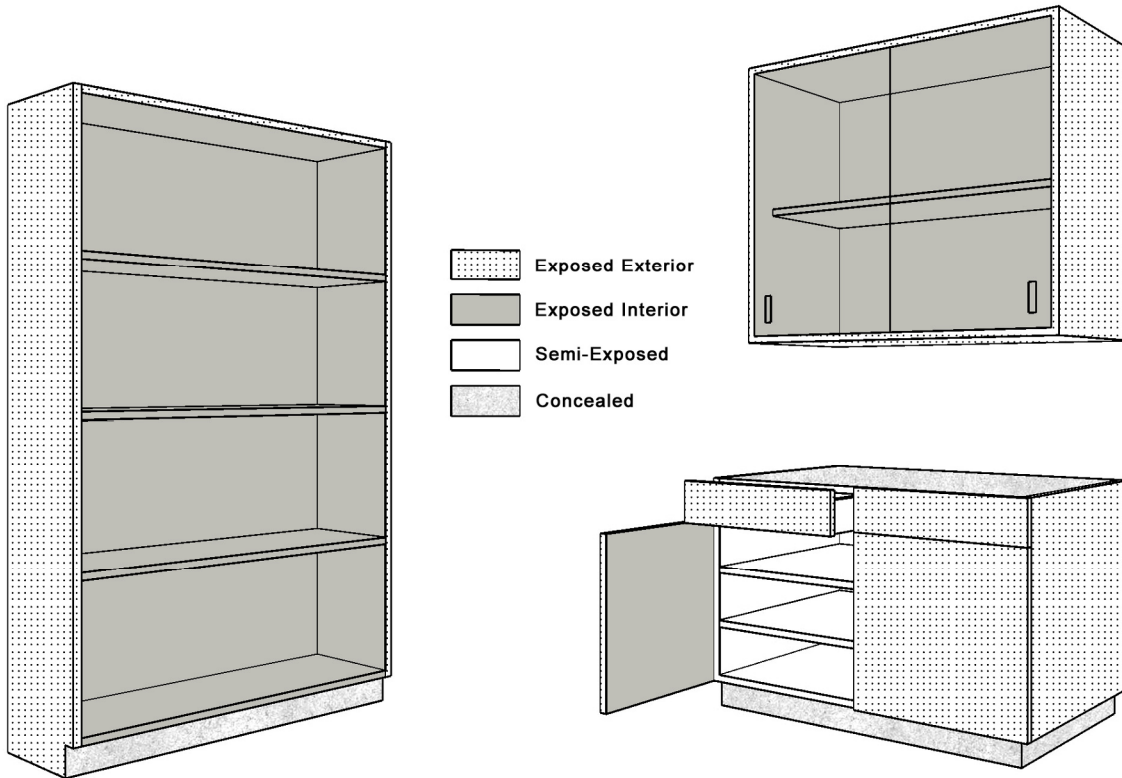
- A. Do not deliver architectural woodwork until site conditions are adequate to receive work; protect items from weather while in transit.
 - 1. Allow architectural woodwork shop finish to completely dry prior to delivery to site; allow materials to off-gas volatile organic compound (VOC) emissions off site.
- B. Store materials indoors, in ventilated areas with constant but minimum temperature of 60 degrees F and maximum relative humidity of 25% to 55%.

**SECTION 06 40 00
CUSTOM CASEWORK**

- C. Do not begin installation of finish carpentry until space is fully enclosed and mechanical systems are fully operational.
 - 1. Maintain interior installation areas at 70 degrees F and 50% to 55% relative humidity.
- D. Immediately remove from site materials with visible mold and materials with mildew.

1.5 SURFACE DEFINITIONS

- A. Surface Definitions shall be in accordance with those of the Architectural Woodwork Standards (1st Edition, October 2009) as depicted in the graphic below.
- B. Material for the Exposed Exterior and Exposed Interior surfaces shall be high-pressure thermoplastic laminate. White melamine will not be allowed. Melamine may be used at Semi-Exposed surfaces.



PART 2 - PRODUCTS

2.1 MATERIALS

- A. Plastic Laminate Finished Casework and Countertops:
 - 1. Quality: WI MoM/Custom Grade, Type I, Style A, frameless, multiple unit construction.

2. Plastic Laminates:
 - a. Types: NEMA LD-3.1 high pressure laminates.
 - 1) Horizontal Surfaces: General Purpose Type, nominal 0.045".
 - 2) Vertical Surfaces: Vertical Surface Type, nominal 0.032".
 - 3) Unexposed Surfaces: Balanced with 0.030" melamine backing sheet.
 - 4) Formed Surfaces: Postforming Type, nominal 0.042".
 - b. Manufacturers:
 - 1) Formica
 - 2) Nevamar
 - 3) Wilsonart
 - 4) Pionite
 - 5) Substitutions: Refer to Section 01 62 00.
 - c. Colors: As selected by Architect from manufacturer's full range of available colors and patterns, including premium line, and excluding metallics.
 3. Particleboard Core: Provide Medite Corp. (Sierrapine)Medite II or Rodman Industries/Resincore I formaldehyde-free medium density fiberboard (MDF) or particleboard made from recycled wood products.
 4. Provide 1 1/8" thick plastic laminate covered plywood shelving at all open casework units and at all locations where shelving span exceeds 36" (thirty-six inches)
 5. Particleboard Core: Provide Medite Corp. (Sierrapine)Medite II or Rodman Industries/Resincore I formaldehyde-free medium density fiberboard (MDF) or particleboard made from recycled wood products.
 6. Provide 1 1/8" thick plastic laminate covered plywood shelving at all open casework units and at all locations where shelving span exceeds 36" (thirty-six inches).
 7. Edgebanding: Provide Doelken-Woodtape, Stock Program including SpecLine, Woodgrain Selector, and KwikEdge.
- B. Casework Hardware: Provide casework hardware items as required for complete installation as indicated; provide types as listed in WI MoM "Manual" but no less than following types. Plug-In Pin Type Shelf Supports (Transparent Finished Casework): Provide holes 1" on center.
1. Adjustable Shelf Standards and Supports (Contractor Option at Plastic Laminate Casework): Flush mounted in cabinet.
 - a. Manufacturers:
 - 1) Futura/No. AS 662 with AS 563/663 support.
 - 2) Knape & Vogt/No. 255 with No. 256 support.
 - 3) Substitutions: Refer to Section 01 62 00.

**SECTION 06 40 00
CUSTOM CASEWORK**

2. Cabinet Hinges: European concealed type, minimum 160 degree opening, with spring closer.
3. Cabinet and Drawer Pulls: Wire type, 4" center to center, satin chrome finish.
 - a. Manufacturers:
 - 1) Baldwin Hardware Manuf. Corp./No. 4672.
 - 2) Stanley Hardware/No. 4484.
 - 3) The Engineered Products Co./No. MC-4023.
 - 4) Substitutions: Refer to Section 01 62 00.
4. Drawer Slides: Full extension, rail mounted type, minimum 100 lb. capacity with ball-bearing rollers.
 - a. Manufacturers:
 - 1) Accuride.
 - 2) Knappe & Vogt.
 - 3) Substitutions: Refer to Section 01 62 00.
5. Cabinet Locks: Pin and tumbler slide bolt lock, two keys each.
 - a. Manufacturers:
 - 1) Schlage Lock Co./46-002 Cabinet Locks.
 - 2) Best Access Systems/5L Series.
 - 3) CompX International/Timberline Locks.
 - 4) Substitutions: Refer to Section 01 62 00.
- C. Anchors, Nails and Screws: Select material, type, size and finish required by each substrate for secure anchorage; provide toothed steel or lead expansion bolt screws for drilled-in-place anchors.
- D. Wood Filler: Color to match wood being filled.

2.2 FABRICATION

- A. General: Fabricate architectural woodwork in accordance with specified quality standards.
- B. Plastic Laminate:
 1. Apply plastic laminate finish in full, uninterrupted sheets consistent with manufactured sizes.
 2. Make corners and joints hairline; slightly bevel arises.
 3. Locate butt joints at least 2'-0" from cutouts.
 4. Cap exposed edges with plastic laminate of same finish and pattern.
 5. Apply laminate backing sheet to reverse side of laminate surfaces.
 6. Provide cutouts for inserts, fixtures and fittings; verify locations from on-site dimensions.

7. Prime paint contact surfaces of cutouts.
 8. Plastic Laminate Countertops: Square butt joints and self edging; applied plastic or metal edging not permitted.
- C. Countertops: Provide maximum sizes available. Locate butt joints at least 2'-0" from cutouts where more than one piece countertops are required.
1. Make corners and joints hairline; slightly bevel arises.
 2. Provide cutouts for inserts, fixtures and fittings; verify locations from on-site dimensions.
- D. Use exposed fastening devices or nails only when approved and unavoidable; arrange neatly.
- E. Assemble woodwork in shop in sizes easily handled and to ensure passage through building openings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication where possible; do not delay job progress, allow for trimming and fitting.

3.2 INSTALLATION

- A. Install work consistent with specified quality grade, plumb, level, true and straight with no distortions.
1. Shim as required, using concealed shims.
- B. Ensure mechanical and electrical items affecting architectural woodwork are properly placed, complete, and have been inspected by Architect prior to commencement of installation.
- C. Secure work to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation.
- D. Scribe and cut for accurate fit to other finished work.
- E. Install architectural woodwork under supervision of factory-trained mechanics.
- F. Attach architectural woodwork securely in place with uniform joints providing for thermal and building movements.
- G. Acceptable Tolerances:
1. Variation from True Position: Maximum 1/16" at any position and maximum 1/8" in any 10'-0" length.
 2. Adjoining Surfaces of Same Material: No variation permitted.

END OF SECTION

PART 1 – GENERAL

1.1 SUMMARY

1.1 Section Includes:

1. Provide thermal insulation system at exterior walls and acoustic batt insulation at interior walls with accessories as required for complete installation.

1.2 SUBMITTALS

All submittals shall be submitted under the provisions of Section 01 33 00.

2.1 Submittal No. 07 21 00A - Product Data: Furnish manufacturer's literature for each type of insulation.

1. Indicate thermal insulation name and number as included in California Energy Commission's Directory of Certified Material.
2. Submit Underwriter's Laboratory approval numbers for required fire ratings; approvals of other laboratories contingent upon acceptance of applicable authorities.
3. Installation Instructions: Submit manufacturer's installation instructions.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Acceptable Manufacturers:

1. Knauf Insulation
2. Owens-Corning Fiberglas Corp./Fiberglas FS-25 Insulation.
3. Certainteed.
4. Rockwool, Milton, Ontario.
5. Substitutions: Refer to Section 01 62 00.

B. Materials

1. Exterior Wall Batt Insulation within closed wall cavity: R-19 Preformed kraft-faced fiberglass batts at all exterior walls.
2. Exterior Wall Batt Insulation exposed to spaces above ceiling: R-19 Preformed foil-faced fiberglass batts at all walls.
3. Acoustic Batt Insulation at Interior Walls: R-11 unfaced.

**SECTION 07 21 00
BATT INSULATION SYSTEMS**

4. Unfaced Batt Mineral Wool in thicknesses as required to fill concealed spaces in framing and where noted in drawings and details.
5. Insulation Supports: Galvanized or electroplated steel wire supports with friction attachment to framing.
6. Nails or staples: Steel wire; electroplated; type and size to suit application.
7. Line Wire: Galvanized steel, 19 gauge wire.
8. Wire Mesh: 1 ½" x 17 gauge poultry netting.
9. Vapor Retarder: Type III, aluminum vapor retarder on one side.
10. Vapor Retarder Tape: Minimum 2" wide self-adhering type designed to maintain vapor retarder integrity and complying with fire resistance ratings as required by applicable codes.
11. Accessories: Furnish as recommended by insulation manufacturer for insulation types, substrates, and conditions involved.
12. Insulation shall comply with California standards for insulating material.
 1. Flame Spread/Smoke Density Rating: Maximum 25/450, ASTM E84.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify substrate and adjacent materials are dry and ready to receive insulation; beginning installation signifies acceptance of conditions.
- B. Ensure mechanical and electrical items affecting work are properly placed, complete, and have been inspected prior to commencement of installation.

3.2 INSTALLATION

- A. Install insulation in accordance with manufacturer's instructions.
- B. Cut and trim insulation neatly, to fit spaces.
 1. Backed Insulation: Use insulation free of ripped backs and edges.
- C. Fit insulation tight within spaces and tight to and behind mechanical and electrical services within insulation plane; leave no gaps or voids; maintain integrity of thermal barrier.
- D. Maintain minimum ventilating airspace as required by the Drawings.
- E. Friction fit in place; use tape or friction supports as necessary to assure permanent installation.
 1. Taping: Tape joints and tears in vapor retarder, including joints between insulation and surrounding construction, to ensure vapor-tight installation.

**SECTION 07 21 00
BATT INSULATION SYSTEMS**

2. Penetration Supports: Cut or bend pins in locations accessible to maintenance personnel, to eliminate potential hazards from exposed pin points.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Flashings and Sheet Metal Underlayment: Provide sheet membrane underlayment at flashings and sheet metal, with accessories as required for complete watertight installation.
2. Membrane Flashing at Penetrations: Provide sheet membrane underlayment and flashing for around penetrations through building paper including windows and doors, with accessories as required for complete watertight installation.
3. Sheet Membrane at Walls: Limit sheet membrane at walls to areas around penetrations through building paper (including doors and window penetrations) and at metal flashings.
 - a. Do not apply vapor retardant sheet membranes at areas indicated to receive foil-faced insulation; application of vapor retarder on both interior and exterior surface results in vapor lock which is detrimental to building.

1.2 SUBMITTALS

All submittals shall be submitted under the provisions of Section 01 33 00.

- A. Submittal No. 07 25 00 A - Product Data: Furnish manufacturer's literature for each type of underlayment.
- B. Submittal No. 07 25 00 B - Shop Drawings: Submit for metal flashings, as related to underlayment.
 1. Clearly indicate general construction, configurations, jointing methods and locations, fastening methods and locations and installation details.
- C. Submittal No. 07 25 00 C - Samples: Furnish samples of each material.

1.3 QUALITY ASSURANCE

- A. Pre-Installation Meeting: Convene one week prior to commencing work; require attendance of parties directly affecting underlayment.
 1. Review procedures and coordination required with related work.

1.4 WARRANTY

- A. Special Warranty: Provide for correcting failure of underlayment to resist penetration of water. Repair underlayment and pay for or replace damaged materials or surfaces.
 1. Special Warranty Period: Two years.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Sheet Metal and Flashing Underlayment: Rubberized sheet membrane with primers and seam sealers as required for complete watertight installation; type as recommended by manufacturer for substrate and for applications indicated.
 - 1. Manufacturers:
 - a. Grace Construction Products: Vycor V40.
 - b. Carlisle Corp.
 - c. Protecto Wrap Company.
 - d. Substitutions: Refer to Section 01 62 00.
- B. Membrane Flashing at Penetrations: Rubberized sheet membrane with primers and seam sealers as required for complete watertight installation; type as recommended by manufacturer for substrate and for applications indicated.
 - 1. Manufacturers:
 - a. Grace Construction Products: Vycor V40.
 - b. Substitutions: Refer to Section 01 62 00.
- C. Concealed Metal Flashings Integral with Underlayments: Minimum 26 gage thick steel with minimum 0.90 oz/sq.ft. galvanized coating; ASTM A653.
 - 1. Fasteners: Standard round wire type of hot dipped galvanized steel; minimum 19/64" head diameter and 0.104" shank diameter; minimum 7/8" long.
- D. Bituminous Paint: Acid and alkali resistant type; black color.
- E. Accessories: Provide as recommended by underlayment manufacturers for specific applications.
 - 1. Plastic Cement: Cutback asphaltic type with mineral fiber components, for sealing and coating flashings; free of toxic solvents and free of asbestos. Capable of setting within 24 hours at temperatures of approximately 75 degrees F and 50% R.H.
- F. Volatile Organic Compound (VOC) Emissions: Provide materials conforming to applicable air quality management district limitations on volatile organic compound (VOC) emissions.

2.2 FLASHING FABRICATION

- A. Fabricate metal flashings as recommended by Sheet Metal and Air Conditioning Contractors National Association (SMACNA) "Sheet Metal Manual".
- B. Form flashings to drain water to exterior at roofing and siding construction for penetrations, sill and header flashings.
- C. Form sections square, true and accurate to size, in maximum possible lengths and free from distortion and other defects detrimental to appearance or performance.
- D. Hem exposed edges of metal flashings minimum 1/4" on underside.

- E. Apply bituminous paint on concealed surfaces of metal flashings.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Install underlayment over surfaces that are dry, free of ridges, warps and voids that could damage paper.
- B. Weatherlap joints minimum 2" and seal with plastic cement; secure in place.
- C. Coordinate installation with installation of components and items projecting through underlayment.

3.2 FLASHINGS INSTALLATION

- A. Install flashings as recommended by Sheet Metal and Air Conditioning Contractors National Association (SMACNA) "Sheet Metal Manual".
- B. Weather-lap joints minimum 2" and seal with plastic cement; secure in place.
- C. Fastenings: Concealed in completed installation.

3.3 UNDERLAYMENT INSTALLATION

- A. Install underlayment in accordance with recommendations of underlayment manufacturer and of manufacturer's of products to cover underlayment; comply with applicable code requirements.
 - 1. Layers: Weather-lap joints as recommended by system manufacturer, not less than 2" at building paper.
 - a. Plaster: Provide two layers building paper underlayment installed in one application with 36" sheets lapped 18" each.
 - b. Other Areas: Provide one layer sheet membrane underlayment.
 - 2. Secure underlayment in place, stagger joints between layers; lap ends minimum 6"; stagger end joints.
 - 3. Apply layer of sheet membrane underlayment extending minimum 18" from penetrations, including windows and doors; start at bottom of penetration and weather-lap joints; apply top layer over metal flashing to direct water to exterior.
- B. Apply plastic cement to substrate prior to application of underlayment starter strips to prevent capillary movement of water back up beneath underlayment.
- C. Weather-lap items projecting through underlayment and seal with plastic cement at building paper underlayment, with sealer recommended by sheet membrane underlayment manufacturer at sheet membrane underlayment.

END OF SECTION

PART 1 – GENERAL

1.1 SUMMARY

- A. Products supplied under this section:
 - 1. Vapor barrier and installation accessories for installation under concrete slabs.

1.2 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. ASTM E1745- 11Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.
 - 2. ASTM E1643- 11Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.
- B. Technical Reference - American Concrete Institute (ACI):
 - 1. ACI 302.2R-06 Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials.

1.3 SUBMITTALS

- A. Submittal No. 07 26 00 A - Summary of test results per paragraph 9.3 of ASTM E 1745.
- B. Submittal No. 07 26 00 B - Manufacturer's samples and literature.
- C. Submittal No. 07 26 00 C - Manufacturer's installation instructions for placement, seaming and penetration repair instructions.
 - a. All mandatory ASTM E1745 testing must be performed on a single production roll per ASTM E1745 Section 8.1.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Vapor barrier shall have all of the following qualities:
 - 1. Maintain permeance of less than 0.01 Perms [grains/(ft² · hr · inHg)] as tested in accordance with mandatory conditioning tests per ASTM E1745 Section 7.1 (7.1.1-7.1.5).
 - 2. Other performance criteria:
 - a. Strength: ASTM E1745 Class A
 - b. Thickness: 15 mils minimum
- A. Vapor barrier products:
 - 1. Basis of Design: Stego Wrap Vapor Barrier (15-mil) by Stego Industries LLC., (877) 464-7834 www.stegoindustries.com.
 - 2. Approved Alternate: Vaporguard by Reef Industries, 713-507-4250. www.reefindustries.com.
 - 3. Approved Alternate: Sundance 15 mil Vapor Barrier by Sundance Inc., (855) 300-7156 www.sundancepolymertech.com.

2.2 ACCESSORIES

- A. Seams :
 - 1. Stego Tape by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.

- B. Penetrations of Vapor barrier:
 - 1. Stego Mastic by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.
 - 2. Stego Tape by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.

- C. Perimeter/edge seal:
 - 1. Stego Crete Claw by Stego Industries LLC, (887) 464-7834 www.stegoindustries.com.
 - 2. Stego Term Bar by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.
 - 3. StegoTack Tape (double sided) by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.

PART 3 – EXECUTION

3.1 PREPARATION

- A. Ensure that subsoil is approved by Architect or Geotechnical Engineer.
 - 1. Level and compact base material.

3.2 INSTALLATION

- A. Install vapor barrier in accordance ASTM E1643.
 - 1. Unroll vapor barrier with the longest dimension parallel with the direction of the concrete placement and face laps away from the expected direction of the placement whenever possible.
 - 2. Extend vapor barrier over footings and grade beams to a distance acceptable to the structural engineer or stop at impediments such as dowels and waterstops.
 - 3. Seal vapor barrier to slab perimeter/edge using Stego Crete Claw and remove dirt, debris, and mud from Crete Claw prior to concrete placement.
 - 4. Overlap joints 6 inches and seal with manufacturer's tape.
 - 5. Apply tape/Crete Claw to a clean and dry vapor barrier.
 - 6. Seal all penetrations (including pipes) per manufacturer's instructions.
 - 7. No penetration of the vapor barrier is allowed except for reinforcing steel and permanent utilities.
 - 8. Repair damaged areas by cutting patches of vapor barrier, overlapping damaged area 6 inches and taping all sides with tape.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Precoated galvanized steel roofing and accessories.
- B. Precoated galvanized steel gutters, fascia covers, rake trim, drip flashing, counter flashing, ridge corner trim, flashing, etc.
- C. Underlayment.

1.2 PERFORMANCE REQUIREMENTS

- A. Testing and Certification:
 - 1. Wind Uplift: UL 580 test:
24 gauge roof panels, with roof fastener clips spaced as detailed on the Drawings
 - 2. Air Infiltration: Panel to meet the following standard when tested in accordance with ASTM E283-73:
 - a. With factory-applied continuous sealant - 0.14 cfm/ft. at 20 psf .
 - 3. Water Penetration: Panel to meet the following standard when tested in accordance with ASTM E331-70 (75):
 - a. With factory-applied continuous sealant, no leakage at 20 psf.
 - 4. Fire Classification: Class B when tested in accordance with ASTM E 108.

1.3 SUBMITTALS

All submittals shall be submitted under the provisions of Section 01 33 00.

- A. Submittal No. 07 41 13A - Shop Drawings:
 - 1. Submit shop drawings indicating thickness and dimensions of parts, fastenings and anchoring methods, details and locations of seams, transitions and other provisions necessary for thermal expansion and contraction.
 - 2. Indicate roof terminations, clearly showing flashings and change of direction caps.
 - 3. Describe all proposed details that deviate from what is shown on the plans.
 - 4. Clearly indicate locations of field and factory applied sealant.
 - 5. Provide plan showing layout of entire roof.
 - 6. Show locations and types of hold-down clips and fasteners.
- B. Submittal No. 07 41 13B - Samples:
 - 1. Submit two samples, 12" long x full width panel, showing proposed metal gauge and seam profile.
 - 2. Submit standard color samples of metal for Architect's selection.

- C. Submittal No. 07 41 13C – Product Data and Installation instructions.
- D. Submittal No. 07 41 13D – Site Conditions
 - 1. Provide completed site condition form for the specified finish to suit actual project conditions.

1.4 QUALITY ASSURANCE

- A. Installers Qualifications
 - 1. Installer must be approved by the Panel Manufacturer in writing prior to work commencing.
 - 2. Installer shall meet the following:
 - a. Successfully applied five metal roofs of comparable size and complexity which reflect a quality and weather tight installation.
 - b. Have been in business for minimum period of five (5) years in the region where the work will be performed.
- B. Manufacturer's Qualifications
 - 1. Manufacturer shall have a minimum of ten (10) years experience supplying metal roofing to the region where the work is to be done.
 - 2. Comply with current independent testing and certification as specified.
 - 3. Manufacturer shall provide proof of liability insurance for their metal roof system.
- C. Comply with CA Building Code requirements.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Protect against damage and discoloration.
- B. Handle panels with non-marring slings.
- C. Do not bend panels.
- D. Store panels above ground, with one end elevated for drainage.
- E. Protect panels against standing water and condensation between adjacent surfaces.
- F. If panels become wet, immediately separate sheets, wipe dry with clean cloth, and allow to air dry.
- G. Painted panels shall be shipped with plastic sheeting or a strippable film coating between all panels. Remove any strippable film coating prior to installation and in any case, do not allow the strippable film coating to remain on the panels in extreme heat, cold, or in direct sunlight or other UV source.
- H. Store accessories in a dry place.

1.6 PROJECT CONDITIONS

- A. Examine the conditions and substrate in which metal roofing work is to be installed. Substrate shall be installed level, flat and true to avoid panel stresses.
- B. Field measurements shall be taken prior to fabrication of panels.
- C. Proceed with roofing installation only after satisfactory conditions are met.

1.7 WARRANTY

- A. Furnish manufacturer's standard 35-year warranty stating architectural fluorocarbon finish will be:
 - 1. Free of fading or color change in excess of 5 Hunter units as measured per ASTM D 2244-68;
 - 2. Will not chalk in excess of numerical rating of 7 when measured in accordance with standard procedures specified in ASTM D 659-74;
 - 3. Will not peel, crack, chip, or delaminate.
- B. Furnish written warranty signed by applicator for two year period from date of substantial completion of the building covering repairs required to maintain roof and flashings in watertight conditions.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Metal Sales Manufacturing.
- B. Substitutions: Refer to Section 01 62 00.

2.2 MATERIALS

- A. Roofing Panels: Metal Sales Manufacturing "Vertical Seam" panels Prefinished Galvalume® or Zinalume® sheet, ASTM AZ50 made of 55% aluminum, 1.6% silicon and the balance zinc as described in ASTM specification A792 – 24 gauge.
 - 1. Fabricate panels with sufficient thickness to meet specified UL 90 wind uplift requirements.
 - 2. Factory fabricated panel with integral continuous overlapping seams suitable for continuous locking or crimping by mechanical means during installation. Field rollformed panel profiles will not be acceptable.
 - 3. Profile
 - a. 1-3/4" high interlocking ribs spaced 18" o.c.
 - 4. Provide factory installed, high grade, hot-melt elastomeric sealant, within the confines of female seam flange, on bottom edge of female seam flange, designed to seal against adjacent male panel leg.
- B. Soffit Panels: Metal Sales Manufacturing Flush Face Series Panel **TLC-1**, 12" panel coverage, 1 1/2" panel height, 20 gauge

**SECTION 07 41 13
METAL ROOF & SOFFIT SYSTEM**

1. Fabricate panels with sufficient thickness to meet specified UL 90 wind uplift requirements.
 2. Factory fabricated panel with integral continuous overlapping seams suitable for continuous locking or crimping by mechanical means during installation. Field roll formed panel profiles will not be acceptable.
 3. Provide factory installed, high grade, hot melt elastomeric sealant, within the confines of female seam flange, on bottom edge of female seam flange, designed to seal against adjacent male panel leg.
- C. Accessories:
1. Typical clip: UL 90 requirements
 - a. Fasteners: Manufacturer's standard #12 - 14 x 6" long self-drilling, hex head drive screws for plywood base material.
 - b. UL-90 Rated Clip: Sliding 22 gauge galvanized steel hook in combination with a double fastened 16 gauge galvanized steel base, both at Fy (MIN) = 33 ksi. Clip hook shall have a shop installed hotmelt butyl sealant for continuity of seal at clip locations.
 2. Slip - Sheeting: Red Rosin Paper at areas where roof system contacts weather treated wood blocking.
 3. Felt underlayment (solid substrate) 30 lb (13.6 kg), asphalt saturated fiberglass felt, non-perforated.
 4. End Closures:
 - a. Material: Weatherproof, laminated, semi-rigid, cross-linked polyethylene foam, tightly fit to panel configurations.
 5. Bedding Compound:
 - a. Polyurethane type.
 6. Sealant:
 - a. Color coordinated primerless silicone or high grade, nondrying butyl as recommended by panel manufacturer.
 - b. Do not use sealant containing asphalt.
 - c. Tape Sealants will not be used without the specific location/application approved by the Architect.
- D. Finish:
1. Kynar 500 coating.
 2. Color: To match existing campus metal roofs. Formulate custom color if necessary.
- F. Fabrication
1. Unless otherwise shown on drawings or specified herein, fabricate panels in continuous one-piece lengths and fabricate flashings and accessories in longest practical lengths.

2. Roofing panels shall be factory formed. Field formed panels are not acceptable.

PART 3- EXECUTION

3.1 EXAMINATION

A. Existing Conditions

1. Verify that members to receive panels are complete, accurately sized and located, in true plane, secure and otherwise properly prepared.
2. Prior to starting work, notify General Contractor about defects requiring correction.
3. Do not start work until conditions are satisfactory.

3.2 PREPARATION

A. Field Measurements

1. Verify prior to fabrication.
2. If field measurements differ from drawing dimensions, notify Architect/Engineer prior to fabrication.

B. Protection

1. Treat, or isolate with protective material, any contacting surfaces of dissimilar materials to prevent electrolytic corrosion.
2. Require workmen who will be walking on roofing panels to wear clean, soft-soled work shoes that will not pick-up stones or other abrasive material which could cause damage and discoloration.
3. Protect work or other trades against damage and discoloration.

C. Surface Preparation

1. Clean and dry surfaces prior to applying sealant.

3.3 INSTALLATION

A. Panels

1. Follow roof panel manufacturer's directions.
2. Install underlayment per manufacturer's recommendations.
1. Install special underlayment where shown on the drawings per manufacturer's directions.
2. Install panel seams vertically.
3. Lap panels away from prevailing wind direction.

**SECTION 07 41 13
METAL ROOF & SOFFIT SYSTEM**

4. Provide formed metal collars at roof penetrations such as scuttles or fans.
5. Do not stretch or compress panel side-lap interlocks.
6. Install preformed flashing at all pipe penetrations.
7. Secure panels without warp or deflection.
8. Install gutters, fascias, rake flashing and other trim.
9. Fully engage interlocking seams.
10. Extend roof panels to overlap gutter openings 2 inches, but do not restrict opportunity to clean gutters.
11. Remove strippable protective film, if used, immediately preceding panel installation.

B. Allowable Erection Tolerance

1. Maximum Alignment Variation: 1/4" in 40 feet.

C. Flashing/Gutters

1. Follow manufacturer's directions and Architect-approved Shop Drawings.
2. Overlap roof panels at least 6 inches.
3. Install flashings to allow for thermal movement.

D. Cutting and Fitting

1. Neat, square and true. Torch cutting is prohibited.
2. Openings 6 inches and larger in any direction: Shop fabricate and reinforce to maintain original load capacity.
3. Where necessary to saw cut panels, debur and treat with galvanic paint.

3.4 CLEAN-UP AND CLOSE-OUT

A. Touch-up

1. Touch-up damaged paint surfaces with air dry touch-up paint provided by manufacturer. Follow directions carefully to minimize color irregularities. Small brush application only - do not spray touch-up paint.

B. Cleaning and Repairing

1. At completion of each day's work and at work completion, sweep panels, flashing and gutters clean. Do not allow fasteners, cuttings, filings or scraps to accumulate.
2. Remove debris from project site upon work completion or sooner, if directed.

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. PVC thermoplastic membrane attached with mechanical fasteners.
- B. Fiberglass-faced primed roof board, attached with mechanical fasteners.
- C. Prefabricated flashings, corners, parapets, stacks, vents, and related details.
- D. Fasteners, adhesives, and other accessories required for a complete roofing installation.
- E. Traffic Protection.

1.2 REFERENCES

- A. NRCA - The NRCA Roofing and Waterproofing Manual.
- B. ASCE 7 - Minimum Design Loads For Buildings And Other Structures.
- C. UL - Roofing Materials and Systems Directory, Roofing Systems (TGFU.R10128).
- D. ASTM C 1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
- E. ASTM D 751 - Standard Test Methods for Coated Fabrics.
- F. ASTM D 4434 - Standard Specification for Poly (Vinyl Chloride) Sheet Roofing.
- G. ASTM E 108 - Standard Test Methods for Fire Tests of Roof Coverings.
- H. ASTM E 119 - Standard Test Methods for Fire Tests of Building Construction and Materials.

1.3 SYSTEM DESCRIPTION

- A. General: Provide installed roofing membrane and base flashings that remain watertight; do not permit the passage of water; and resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.
- B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing membrane manufacturer based on testing and field experience.
- C. Physical Properties:
 - 1. Roof product must meet the requirements of Type III PVC sheet roofing as defined by ASTM D 4434 and must meet or exceed the following physical properties.
 - 2. Thickness: 60 mil, nominal, in accordance with ASTM D 751.
 - 3. Thickness Over Scrim: ≥ 28 mil in accordance with ASTM D 751.
 - 4. Breaking Strengths: ≥ 390 lbf. (MD) and ≥ 438 lbf. (XMD) in accordance with ASTM D 751, Grab Method.
 - 5. Elongation at Break: $\geq 31\%$ (MD) and $\geq 31\%$ (XMD) in accordance with ASTM D 751, Grab Method.
 - 6. Heat Aging in accordance with ASTM D 3045: 176 °F for 56 days. No sign of cracking, chipping or crazing. (In accordance with ASTM D 4434).
 - 7. Factory Seam Strength: ≥ 431 lbf. in accordance with ASTM D 751, Grab Method.

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8. Tearing Strength: ≥ 132 lbf. (MD) and ≥ 163 lbf. (XMD) in accordance with ASTM D 751, Procedure B.
9. Low Temperature Bend (Flexibility): Pass at -40 °F in accordance with ASTM D 2136.
10. Accelerated Weathering: No cracking, checking, crazing, erosion or chalking after 5,000 hours in accordance with ASTM G 154.
11. Linear Dimensional Change: $< 0.5\%$ in accordance with ASTM D 1204 at 176 ± 2 °F for 6 hours.
12. Water Absorption: $< 2.6\%$ in accordance with ASTM D 570 at 158 °F for 166 hours.
13. Static Puncture Resistance: ≥ 56 lbs. in accordance with ASTM D 5602.
14. Dynamic Puncture Resistance: ≥ 14.7 ft-lbf. in accordance with ASTM D 5635.

D. Cool Roof Rating Council (CRRC):

1. Membrane must be listed on CRRC website.
 - a. Initial Solar Reflectance: $\geq 88\%$
 - b. Initial Thermal Emittance: $\geq 87\%$
 - c. Initial Solar Reflective Index (SRI): ≥ 111
 - d. 3-Year Aged Solar Reflectance: $\geq 68\%$
 - e. 3-Year Aged Thermal Emittance: $\geq 84\%$
 - f. 3-Year Aged Solar Reflective Index (SRI): ≥ 82

1.4 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Submittal No. 07 54 19 A: Product Data sheets on each product to be used, including:
 1. Preparation instructions and recommendations.
 2. Storage and handling requirements and recommendations.
 3. Installation methods.
 4. Maintenance requirements.
- C. Submittal No. 07 54 19 B: Shop Drawings: Indicate insulation pattern, overall membrane layout, field seam locations, joint or termination detail conditions, and location of fasteners.
- D. Submittal No. 07 54 19 C: Verification Samples: For each product specified, two samples, representing actual product, color, and finish.
 1. 4 inch by 6 inch sample of roofing membrane, of color specified.
 2. Termination bar, fascia bar with cover, drip edge and gravel stop if to be used.
 3. Each fastener type to be used for installing membrane, insulation/recover board, termination bar and edge details.
- E. Submittal No. 07 54 19 D: Installer Certification: Certification from the roofing system manufacturer that Installer is approved, authorized, or licensed by manufacturer to install roofing system.

- F. Submittal No. 07 54 19 E: Manufacturer's warranties.

1.5 QUALITY ASSURANCE

- A. Perform work in accordance with manufacturer's installation instructions.
- B. Manufacturer Qualifications: A manufacturer specializing in the production of PVC membranes systems and utilizing a Quality Control Manual during the production of the membrane roofing system that has been approved by and is inspected by Underwriters Laboratories.
- C. Installer Qualifications: Company specializing in installation of roofing systems similar to those specified in this project and approved by the roofing system manufacturer.
- D. Source Limitations: Obtain components for membrane roofing system from roofing membrane manufacturer.
- E. There shall be no deviations from the roof membrane manufacturer's specifications or the approved shop drawings without the prior written approval of the manufacturer.

1.6 REGULATORY REQUIREMENTS

- A. Conform to applicable code for roof assembly wind uplift and fire hazard requirements.
- B. Fire Exposure: Provide membrane roofing materials with the following fire-test-response characteristics. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.
 - 1. Exterior Fire-Test Exposure:
 - a. Class A; ASTM E 108, for application and roof slopes indicated.
 - 2. Fire-Resistance Ratings: Comply with ASTM E 119 for fire-resistance-rated roof assemblies of which roofing system is a part.
 - 3. Conform to applicable code for roof assembly fire hazard requirements.
- C. Wind Uplift:
 - 1. Roofing System Design: Provide a roofing system designed to resist uplift pressures calculated according to the current edition of the ASCE-7 Specification *Minimum Design Loads for Buildings And Other Structures*.

1.7 PRE-INSTALLATION MEETING

- A. Convene meeting not less than one week before starting work of this section.
- B. Review methods and procedures related to roof deck construction and roofing system including, but not limited to, the following.
 - 1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing installer, roofing system manufacturer's representative, deck installer, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.
 - 2. Review and finalize construction schedule and verify availability of materials, installer's personnel, equipment, and facilities needed to make progress and avoid delays.

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3. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
4. Review structural loading limitations of roof deck during and after roofing.
5. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
6. Review governing regulations and requirements for insurance and certificates if applicable.
7. Review temporary protection requirements for roofing system during and after installation.
8. Review roof observation and repair procedures after roofing installation.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storing and mixing with other components.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Store roof materials and place equipment in a manner to avoid permanent deflection of deck.
- E. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.9 WARRANTY

- A. Contractor's Warranty: The contractor shall warrant the roof application with respect to workmanship and proper application for two (2) years from the effective date of the warranty issued by the manufacturer.
- B. Manufacturer's Warranty: Must be no-dollar limit type and provide for completion of repairs, replacement of membrane or total replacement of the roofing system at the then-current material and labor prices throughout the life of the warranty. In addition the warranty must meet the following criteria:
 1. Warranty Period: 20 years from date issued by the manufacturer.
 2. No exclusion for damage caused by ponding water.
 3. No exclusion for damage caused by biological growth.
 4. Issued direct from and serviced by the roof membrane manufacturer.
 5. Transferable for the full term of the warranty.

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. All roofing system components to be provided or approved by roof system manufacturer.
- B. Acceptable Manufacturers:
 1. Duro-Last, Inc.

2. Substitutions per Section 01 62 00.

2.2 ROOFING SYSTEM COMPONENTS

- A. Single Ply Roofing Membrane: PVC thermoplastic membrane conforming to ASTM D 4434, type III, fabric-reinforced, PVC. Membrane properties as follows:
 1. Thickness:
 - a. 60 mil.
 2. Exposed Face Color:
 - a. White.
- B. Accessory Materials: Provide accessory materials supplied by or approved for use by roof system manufacturer
 1. Sheet Flashing: Manufacturer's standard reinforced PVC sheet flashing.
 2. Factory Prefabricated Flashings: manufactured using Manufacturer's PVC membrane.
 - a. Stack Flashings.
 - b. Curb Flashings.
 - c. Inside and Outside Corners.
 3. Sealants and Adhesives: Compatible with roofing system and supplied by roof system manufacturer.
 - a. Caulk.
 - b. Strip Mastic.
 4. Slip Sheet: Compatible with roofing system and supplied by roof system manufacturer.
 5. Fasteners and Plates: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening membrane and insulation to substrate. Supplied by roof system manufacturer.
 - a. #14 Heavy Duty Fasteners.
 - b. Steel Membrane Plates.
 - c. 3 inch Metal Plates.
 6. Termination and Edge Details: Supplied by roof system manufacturer.
 - a. Termination Bar.
 - b. 2-Piece Edge Metal System.
 7. Vinyl Coated Metal: 24 gauge, hot-dipped galvanized, grade 90 metal with a minimum of 17 mil of PVC roofing membrane laminated to one side.
 8. Two-Way Roof Vents: Supplied by roof system manufacturer. Install a minimum of 1 vent for each 1,000 ft² (93 m²) of roof area.
- C. Substrate (recover) Board:
 1. Glass-mat-faced, water-resistant gypsum substrate conforming to ASTM C 1177/C 1177M.
 - a. ¼ inch thick.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that the surfaces and site conditions are ready to receive work.
- B. Verify that the deck is supported and secured.
- C. Verify that the deck is clean and smooth, free of depressions, waves, or projections, and properly sloped to drains, valleys, eaves, scuppers or gutters.
- D. Verify that the deck surfaces are dry and free of standing water, ice or snow.
- E. Verify that all roof openings or penetrations through the roof are solidly set.
- F. If substrate preparation is the responsibility of another contractor, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Surfaces shall be clean, smooth, free of fins, sharp edges, loose and foreign material, oil, grease, and bitumen.

3.3 INSTALLATION

- A. Install insulation in accordance with the roof manufacturer's requirements.
- B. Separation Board: Fiberglass-faced primed roof board.
 - 1. Use only fasteners, stress plates and fastening patterns accepted for use by the roof manufacturer. Fastening patterns must meet applicable design requirements.
 - a. Install fasteners in accordance with the roof manufacturer's requirements. Fasteners that are improperly installed must be replaced or corrected.
 - b. Attach boards in parallel courses with end joints staggered 50% and adjacent boards butted together with no gaps greater than ¼ inch.
- C. Roof Membrane: 60 mil, PVC thermoplastic membrane.
 - 1. Use only fasteners, stress plates and fastening patterns accepted for use by the roof manufacturer. Fastening patterns must meet the applicable design requirements.
 - 2. Install fasteners in accordance with the roof manufacturer's requirements. Fasteners that are improperly installed shall be replaced or corrected.
 - 3. Mechanically fasten membrane to the structural deck utilizing fasteners and fastening patterns that in accordance with the roof manufacturer's requirements.
 - 4. Cut membrane to fit neatly around all penetrations and roof projections.
 - 5. Unroll roofing membrane and positioned with a minimum 6 inch overlap.
- D. Seaming:
 - 1. Weld overlapping sheets together using hot air. Minimum weld width is 1-1/2 inches.
 - 2. Check field welded seams for continuity and integrity and repair all imperfections by the end of each work day.

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- E. Membrane Termination/Securement: All membrane terminations shall be completed in accordance with the membrane manufacturer's requirements.
1. Provide securement at all membrane terminations at the perimeter of each roof level, roof section, curb flashing, skylight, expansion joint, interior wall, penthouse, and other similar condition.
 2. Provide securement at any angle change where the slope or combined slopes exceeds two inches in one horizontal foot.
- F. Flashings: Complete all flashings and terminations as indicated on the drawings and in accordance with the membrane manufacturer's requirements.
1. Provide securement at all membrane terminations at the perimeter of each roof level, roof section, curb flashing, skylight, expansion joint, interior wall, penthouse, and other similar condition.
 - a. Do not apply flashing over existing thru-wall flashings or weep holes.
 - b. Secure flashing on a vertical surface before the seam between the flashing and the main roof sheet is completed.
 - c. Extend flashing membrane a minimum of 6 inches (152 mm) onto the main roof sheet beyond the mechanical securement.
 - d. Use care to ensure that the flashing does not bridge locations where there is a change in direction (e.g. where the parapet meets the roof deck).
 2. Penetrations:
 - a. Flash all pipes, supports, soil stacks, cold vents, and other penetrations passing through the roofing membrane as indicated on the Drawings and in accordance with the membrane manufacturer's requirements.
 - b. Utilize custom prefabricated flashings supplied by the membrane manufacturer.
 - c. Existing Flashings: Remove when necessary to allow new flashing to terminate directly to the penetration.
 3. Pipe Clusters and Unusual Shapes:
 - a. Clusters of pipes or other penetrations which cannot be sealed with prefabricated membrane flashings shall be sealed by surrounding them with a prefabricated vinyl-coated metal pitch pan and sealant supplied by the membrane manufacturer.
 - b. Vinyl-coated metal pitch pans shall be installed, flashed and filled with sealant in accordance with the membrane manufacturer's requirements.
 - c. Pitch pans shall not be used where prefabricated or field fabricated flashings are possible.
- G. Roof Drains:
1. Coordinate installation of roof drains and vents specified in Section 22 00 00 - Plumbing Specialties.
 2. Remove existing flashing and asphalt at existing drains in preparation for sealant and membrane.
 3. Provide a smooth clean surface on the mating surface between the clamping ring and the drain base.

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H. Edge Details:

1. Provide edge details as indicated on the Drawings. Install in accordance with the membrane manufacturer's requirements.
2. Join individual sections in accordance with the membrane manufacturer's requirements.
3. Coordinate installation of metal flashing and counter flashing specified in Section 07 62 00.
4. Manufactured Roof Specialties: Coordinate installation of copings, counter flashing systems, gutters, and roof expansion assemblies specified in Section 07 62 00.

I. Water cut-offs:

1. Provide water cut-offs on a daily basis at the completion of work and at the onset of inclement weather.
2. Provide water cut-offs to ensure that water does not flow beneath the completed sections of the new roofing system.
3. Remove water cut-offs prior to the resumption of work.
4. The integrity of the water cut-off is the sole responsibility of the roofing contractor.
5. Any membrane contaminated by the cut-off material shall be cleaned or removed.

3.4 FIELD QUALITY CONTROL

- A. The membrane manufacturer's representative shall provide a comprehensive final inspection after completion of the roof system. All application errors shall be addressed and final punch list completed.

3.5 PROTECTION

- A. Protect installed roofing products from construction operations until completion of project.
- B. Where traffic is anticipated over completed roofing membrane, protect from damage using durable materials that are compatible with membrane.
- C. Repair or replace damaged products after work is completed.

END OF SECTION

PART I GENERAL

1.1 SUMMARY

A. The Project Includes But Not Limited To:

1. Furnish all labor, materials, tools, equipment and incidentals required for the professional application of spray-on protective elastomeric coating system where required.
2. Work includes application of a two part protective coating over foam over weather membrane over existing sheathing for a portion of the facility's roof to repair and integrate new roof curbs and/or penetrations.
3. Work shall also include repair of areas with visible sag and ponding to achieve proper drainage.
4. Entire surface area must be cleaned and prepared according to manufacturer's recommendations. The application surface must be smooth and free of grease, wax, dirt, contaminants, moisture, and any other foreign matter that would interfere with adhesion.
5. A minimum of an eighteen-year labor and materials no dollar limit warranty/guarantee shall be provided, without limiting any other warranty provided in the contract documents.
6. All work shall be performed under favorable weather conditions.
7. All materials and workmanship performed by the Contractor or his Subcontractor shall be in accordance with standard industry products and practices
8. Contractor shall comply with all codes, ordinances, rules, regulations, orders and other legal requirements of public authorities which bear on the performance of the work.

1.2 SUBMITTALS

A. Submit under provisions of Section 01 33 00.

B. Submittal No. 07 60 11 A – Product Data sheets on each product to be used, including:

1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.
4. Maintenance requirements.

C. Submittal No. 07 60 11 B – Verification Samples: For each product specified, two samples, representing actual product, color, and finish.

1. 4 inch by 6 inch sample of roofing foam material.
2. Elastomeric coating system and available colors.
3. Weather membrane.

installing D. Submittal No. 07 60 11 C – Installer Certification: Certification letter confirming the subcontractor this system has a minimum of five years of experience installing similar systems. Include a list of projects completed in the last 12 months.

E. Submittal No. 07 60 11 D – Manufacturer’s warranties.

1.3 QUALITY ASSURANCE

- A. Perform work in accordance with manufacturer’s installation instructions.
- B. Qualifications: An installer specializing in the installation of spray applied foam roofing systems with a minimum of 5 years experience in the field.
- C. Source Limitations: Obtain components for roofing system from manufacturers who publish a complete library of material and installation information.
- D. There will be no deviations from the roof membrane manufacturer’s specifications or the approved submittals without the prior written approval of the architect.

1.4 REGULATORY REQUIREMENTS

- A. Conform to applicable code for roof assembly fire hazard requirements.
- B. Fire Exposure: Provide membrane roofing materials with the following fire-test-response characteristics. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.
 - 1. Exterior Fire-Test Exposure:
 - a. Class A; ASTM E 108, for application and roof slopes indicated.
 - 2. Fire-Resistant Ratings: Comply with ASTM E 119 for fire-resistant-rated roof assemblies of which roofing system is a part.
 - 3. Conform to applicable code for roof assembly fire hazard requirements.

1.5 PRE-INSTALLATION MEETING

- A. Convene meeting not less than one week before starting work of this section.
- B. Review methods and procedures related to roof deck construction and roofing system including, but not limited to, the following:
 - 1. Meet with Owner, Architect, Owner’s insurer if applicable, testing and inspecting agency representative, roofing installer, deck installer, and installers whose work interfaces with or affects roofing including installers or roof accessories and roof-mounted equipment.
 - 2. Review and finalize construction schedule and verify availability of materials, installer’s personnel, equipment, and facilities needed to make progress and avoid delays.
 - 3. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastenting.

4. Review structural loading limitations of roof deck during and after roofing.
5. Review base flashings, special roof details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roof system.
6. Review temporary protection requirements for roofing system during and after installation.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storing and mixing with other components.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
- C. Store roof materials and place equipment in a manner to avoid permanent deflection of deck.
- D. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.7 WARRANTY

- A. Contractor's Warranty: The contractor shall warrant the roof application with respect to workmanship and proper application for two (2) years from the effective date of the warranty issued by the manufacturer.
- B. Manufacturer's Warranty: Must be no-dollar limit type and provide for completion of repairs, replacement of membrane or total replacement of the roofing system at the then-current material and labor prices throughout the life of the warranty. In addition, the warranty must meet the following criteria:
 1. Warranty Period: 20 years from date issued by the manufacturer.
 2. No exclusion for damage caused by ponding water.
 3. No exclusion for damage caused by biological growth.
 4. Issued direct from and services by the roof membrane manufacturer.
 5. Transferrable for the full term of the warranty.

PART 2 PRODUCTS

2.1 PROTECTIVE COATING MATERIAL

- C. Elastomeric, acrylic, monolithic roof coating; Waterproof; White; Title 24 compliant; UV resistant; Class A Fire Rating – "Polyglass PG 700" as manufactured by Polyglass USA, Inc, 1111 West Newport Center Drive, Deerfield Beach, Florida 33442.
- D. Provide architect with manufacturer's product data, specifications and installation instructions prior to start of construction. Product materials subject to approval of architect and owner.

2.2 SPRAY APPLIED FOAM

- A. Closed cell monolithic polyurethane spray foam –3 lb spray applied foam as manufactured by Gaco Western LLC, 1245 Chapman Drive, Waukesha WI 53186.
- B. Provide architect with manufacturer's Product Data, specifications and installation instructions prior to start of construction.

2.3 WEATHER BARRIER

- A. Self -adhering rubberized sheet membrane – “Grace Ice and Water Shield” as manufactured by GCP Technologies Inc.

PART 3 EXECUTION

3.1 INSPECTION

- A. The Contractor shall have inspected the work site as to the nature and location of the work, the general and local conditions, particularly those bearing upon availability of transportation, disposal, handling and storage of materials, availability of labor, water, electric power, work in sensitive and secure environment and similar physical conditions at the site, the character of equipment facilities needed preliminary to and during the prosecution of the work and all other matters which can in any way affect the work or the cost thereof under this contract.
- B. The Contractor further shall have inspected the site as to the measurements, character, quality, and quantity of surface and subsurface materials to be encountered in the construction site to every extent possible. Any failure by the Contractor to acquaint himself with conditions of the site will not relieve him from responsibility for properly estimating the difficulty or cost of successfully performing the work.
- C. Contractor shall ensure favorable weather conditions prior to application of protective coating. Contractors work shall not expose a greater area of the roof than can be temporarily weatherproofed at the end of any work day when inclement weather dictates such protective measures be utilized.
 - a. Install weather membrane over new or existing materials exposed as part of work of this project.
 - b. Install spray applied foam in thicknesses to meet existing roofing system depth.
 - c. Install specified spray applied elastomeric roof coating in two coats, allowing the first coat to dry before second coat is applied. Combined coating thickness of 1 ½ gallons per square.
 - d. After installation, close off area to prevent unauthorized traffic.
 - e. Inspect seams and flashings for air pockets, wrinkles, fishmouths, unlapped joints and tears.
- D. Contractor shall coordinate all work with the school staff so as not to negatively affect daily operations.

3.2 SITE CONDITIONS DURING CONSTRUCTION

- A. If unanticipated conditions are encountered that interfere with the work, immediately notify the Architect for direction.
- B. Provide reasonable noise and dust abatement practices as needed to prevent undue disturbance and nuisance to employees, members of the public and to other occupants of the premises and surrounding areas. Such abatement practices shall comply with applicable OSHA

regulations.

- C. Coordinate with school staff for clearing vehicles from property to prevent damage from overspray.

3.3 SAFETY AND CLEANING

- A. The Contractor is responsible for work site security and safety throughout the project. All work shall conform to pertinent OSHA regulations and to other State and local codes and ordinances as applicable.
- B. Erect and maintain temporary bracing, shoring, lights, fences, barricades, signs and other measures as necessary to protect the public, workers, County employees and adjoining areas from damage from construction work, all in accordance with applicable codes and regulations.
- C. Protect areas adjacent to work site from damage by equipment or workers.
- D. Do not leave materials and equipment unsecured during construction period.
- E. Execute cleanup on a daily basis to ensure that the facility and surrounding area is maintained free from accumulation of waste materials, dust and debris.
- F. The Contractor shall be responsible for the disposal of all removed materials and other debris in a safe, legal manner, in accordance with applicable laws and ordinances and as prescribed by authorities having jurisdiction.
- G. At completion of project, remove all waste materials, tools, equipment, machinery and surplus materials, leaving facility and surrounding area clean and in a condition equal to the condition it was in at the beginning of project.

3.4 WARRANTY

- A. The Contractor shall provide a minimum of eighteen-year labor and material no dollar limit warranty/guarantee at the time of project completion, without limiting any other warranty provided in the contract documents.

PART 4 SECURITY

4.1 CONTRACTOR'S SECURITY RESPONSIBILITIES

- A. Protect work, stored materials, tools and vehicles from loss, theft and unauthorized entry.
- B. No smoking shall be permitted on School Campus.
- C. Storage of materials onsite to be coordinated with school staff.
- D. Keep existing driveways, entrances and exits serving the premises clear and available for use at all times. Do not use these areas for parking or storage of materials.
- E. Working hours shall be coordinated with the school staff.

4.3 GENERAL INSTRUCTIONS

- A. The Contractor shall be responsible for all individuals at the site under his/her direction, including any subcontractors and their workers.

**SECTION 07 60 11
SPRAY APPLIED FOAM ROOFING**

- B. This is a prevailing wage project pursuant to Section 1770 et. Seq. of the Labor Code. Contractor will be required to pay, at least, the general prevailing wage rates as determined by the Director of the Department of Industrial Relations of the State of California.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Provide galvanized steel flashing and sheet metal including accessories for a complete weather tight installation, including the following.
 - 1. Formed sheet metal flashings and fabrications, including the following:
 - a. Roof penetration flashings.
 - b. Roof termination flashings and counterflashings.
 - c. Edge termination flashings.
 - d. Miscellaneous building sheet metal flashings.
 - e. Gutters.
 - f. Miscellaneous sheet metal fabrications.
 - 2. Manufactured reglets with removable counterflashings.
 - 3. Sealants associated with shop fabrication of sheet metal work.
- B. Related Sections
 - 1. Section 05 50 00 "Metal Fabrications" for steel pipe downspouts.
 - 2. Section 07 60 11 "Spray Applied Foam roofing" for metal flashings included as part of Spray Applied Foam roof system.
 - 3. Section 07 54 19 "PVC Membrane Roofing" for flexible sheet flashing installed in conjunction with sheet metal flashings.
 - 4. Section 07 92 00 "Joint Protection" for field-applied building sealants installed in conjunction with sheet metal work.
 - 5. Section 09 90 10 "Modernization Painting" for field painting of non-factory-finished sheet metal items exposed to view.

1.2 REFERENCES

- A. Sheet Metal and Air Conditioning Contractors National Association (SMACNA): Architectural Sheet Metal Manual, Fifth Edition.
- B. ANSI/ASTM B32 - Solder Metal.
- C. ASTM A525 - Steel Sheet, Zinc Coated, Galvanized by the Hot-Dip Process.
- D. FS O-F-506 - Flux, Soldering, Paste and Liquid.
- E. FS QQ-S-571 - Solder, Tin Alloy.
- F. FS SS-C-153 - Cement, Bituminous, Plastic.
- G. NAAMM - Metal Finishes Handbook.

H. NRCA (National Roofing Contractors Association) - Roofing Manual.

1.3 PERFORMANCE REQUIREMENTS

- A. General: Install sheet metal flashing and trim to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failing, rattling, leaking, and fastener disengagement.
- B. Fabricate and install roof edge flashing and copings capable of resisting the following forces according to recommendations in FMG Loss Prevention Data Sheet 1-49:
 - 1. Wind Zone 1: For velocity pressures of 21 to 30 lbf/sq. ft: 60 lbf/sq. ft. perimeter uplift force, 90 lbf/sq. ft. corner uplift force, and 30 lbf/sq. ft. outward force.
- C. Thermal Movements: Provide sheet metal flashing and trim 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 sheet metal and trim 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, ambient; 180 deg F, material surfaces.
- D. Water Infiltration: Provide sheet metal flashing and trim that do not allow water infiltration to building interior.

1.4 QUALITY ASSURANCE

- A. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual". Conform to dimensions and profiles shown unless more stringent requirements are indicated.
- B. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section for project management and coordination.
 - 1. Meet with Owner, Architect, Owner's insurer if applicable, installer and installer's whose work interfaces with or affects sheet metal flashing and trim including installers of roofing materials, roof accessories, unit skylights, and roof-mounted equipment.
 - 2. Review methods and procedures related to sheet metal flashing and trim.
 - 3. Examine substrate conditions for compliance with requirements, including flatness and attachment to structural members.
 - 4. Document proceedings, including corrective measures and action required, and furnish copy of record to each participant.

1.5 SUBMITTALS

All submittals shall be made under the provisions of Section 01 33 00.

- A. Submittal No. 07 62 00 A – Product Data
 - 1. Submit product data for each specified item.

SECTION 07 62 00
SHEET METAL FLASHING

2. Describe material profile, jointing pattern, jointing details, fastening methods, and installation details.
- B. Submittal No. 07 62 00 B – Shop Drawings
1. Clearly indicate dimensioning, layout, general construction details including closures, flashings, locations and types of sealants, anchorages, and method of anchorage.
- C. Submittal No. 07 62 00 C– Samples for Verification
1. Provide full sized sample of metal flashing illustrating typical seam, external corner, internal corner, junction to vertical dissimilar surface, material, and finish.
- D. Submittal No. 07 62 00 D – Installation Instructions
1. Submit manufacturer's installation instructions.
- E. Mockup Samples: Build sheet metal mockups to demonstrate qualities of materials and execution and aesthetic effects of the following conditions. Include fasteners, cleats, clips, closures, and other attachments.
1. Roof penetration flashings.
 2. Roof edge termination flashings.
 3. Gutters.
 4. Exposed trim and fascia covers.
- 1.6 DELIVERY, STORAGE, AND HANDLING
- A. Deliver sheet metal flashing materials and fabrications undamaged. Protect sheet metal flashing and trim materials and fabrications during transportation and handling.
- B. Unload, store, and install sheet metal flashing materials and fabrications in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack materials on platforms or pallets, covered with suitable weathertight and ventilated covering. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage.
- 1.7 WARRANTY
- A. Special Warranty: Provide for correcting failure of metal flashing system to resist penetration of water and damage from wind.
1. Special Warranty Period: Two years.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Galvanized Steel: Zinc-coated (galvanized) steel sheet, Class A250 coating. 24 gauge unless noted otherwise on drawings.
- B. Aluminum: ASTM B209 minimum thickness .0603".
- C. Lead Sheet: ASTM B749, Type L51121, copper-bearing, 4 lbs. per square foot.

2.2 ACCESSORIES

- A. Flashing and Sheet Metal:
 - 1. Provide heavier gauge metal where recommended by SMACNA Manual for size of component.
 - 2. Mill phosphatized where indicated to be field painted.
- B. Solder and Fasteners: As recommended by SMACNA and complying with applicable codes and regulations; hot dipped galvanized minimum coating comparable to G90.
- C. Concealed Sealant: Butyl type for use in conjunction with sheet metal; non-staining; non-corrosive; non-shrinking and non-sagging; ultra-violet and ozone resistant for exterior concealed applications.
- D. Separation Coating: Tremco 201/60R, Vulkem 201R.
- E. Sealing Compound: Equal to Tremco/Vulkem 245.
- F. Underlayment: Not used.
- G. Fastener: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads.
 - 1. Exposed Fasteners: Heads matching color of sheet metal by means of plastic caps or factory-applied coating.
 - 2. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws, gasketed, with hex washer head.
 - 3. Blind Fasteners: High-strength aluminum or stainless-steel rivets.
 - 4. Spikes and Ferrules: Same material as gutter; with spike and ferrule matching internal gutter width.

2.3 MANUFACTURED SHEET METAL FLASHING AND TRIM

- A. 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.

SECTION 07 62 00
SHEET METAL FLASHING

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Fry Reglet Corporation
 - i) Surface-Mounted Type: Model SM
 - ii) Stucco Type: Model ST
 - iii) Concrete Type: Model CO
 - iv) Masonry type: Model MA
2. Material: Stainless Steel, 0.0188 inch thick (26 gauge).
3. Surface-Mounted Type: Provide with slotted holes for fastening to substrate, with neoprene or other suitable weatherproofing washers, and with channel for sealant at top edge.
4. Stucco Type: Provide with upturned fastening flange and extension leg of length to match thickness of applied finish materials.
5. Concrete Type: Provide 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.
6. Masonry Type: Provide with offset top flange for embedment in masonry mortar joint.
7. 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.
8. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counter flashing lower edge.

2.4 FABRICATION

- A. Fabricate sheet metal in accordance with SMACNA Architectural Sheet Metal Manual.
- B. Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.
 1. Fabricate corners and intersections in shop with solder joints; watertight fabrication.
- C. Form sections in longest practical lengths; make allowance for expansion at joints.
- D. Hem exposed edges on underside 1/2"; miter and seam corners.
- E. Backpaint flashings with heavy bodied bituminous paint to a minimum dry film thickness of 15 mil. where in contact with cementitious materials or dissimilar metals.
- F. Form pitch pans watertight, with minimum 4" upstand and 4" flanges; form pans minimum 6" wider than item passing through roof membrane.
- G. Form umbrella flashings with minimum 2" overhang, to shed water away from pitch pans.
- H. Form material with standing seam. Solder and seal metal joints. After soldering, remove flux. Wipe and wash solder joints clean.
- I. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.

2.5 ROOF DRAINAGE SHEET METAL FABRICATIONS

- A. Hanging Gutters: Fabricate to cross section indicated, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in minimum 96-inch long sections. Furnish flat-stock gutter spaces and gutter brackets fabricated from same metal as gutters, of size recommended by SMACNA but not less than twice the gutter thickness. Fabricate expansion joints, expansion joint covers, and gutter accessories from same metal as gutters.
 - 1. Material: Galvanized steel, unless otherwise indicated.
 - a. Thickness: 0.0359 inch (20 gauge), except where indicated otherwise.
 - 2. Expansion Joints: Lap type.
 - 3. Accessories:
 - a. Wire ball downspout strainer.
 - b. Continuous removable leaf screen with sheet metal frame and hardware cloth screen.
- B. Downspouts: By Section 05 50 00 Metal Fabrications.
- D. Conductor Heads: Fabricate conductor heads with flanged back and stiffened top edge and of dimensions and shape indicated, complete with outlet tubes and built-in overflows.
 - 1. Material: Galvanized Steel
 - a. Thickness: 0.0359 inch (20 gauge), except where indicated otherwise.

2.6 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

- A. Roof Edge Flashing and Fascia Wraps: Fabricate in minimum 96-inches long, but not exceeding 10-foot long sections. Furnish with 6-inch wide joint cover plates.
 - 1. Material: Galvanized steel.
 - a. Thickness: 0.0299 inch (22 gauge).
- B. Copings: Fabricate minimum of 96-inches long, but not exceeding 10-foot long, sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and drill elongated holes for fasteners on interior leg. Miter corners, seal, and solder or weld watertight.
 - 1. Material: Galvanized steel.
 - a. Thickness: 0.0359 inch (20 gauge), except where indicated otherwise.
 - b. Joint Style: Butt, with 12 inch wide concealed backup plate.
- C. Base Flashings, Flashing Receivers, and Counterflashings:
 - 1. Material: Galvanized steel.
 - a. Thickness: 0.0299 inch (22 gauge).
- D. Roof Drain Flashing:
 - 1. Material: Lead.
 - a. Weight: 4.0 lb/sq. ft.
- E. Vent Stack Roof Penetration:
 - 1. Material: Lead.
 - a. Weight: 4.0 lb./sq. ft.
- F. Splash Pans:
 - 1. Material: Stainless steel.
 - a. Thickness: 0.0250 inch (24 gauge).

2.7 WALL FABRICATIONS

- A. Openings Flashing in Frame Construction: Fabricate head, sill, and similar flashings to extend 4 inches beyond wall openings. Form head and sill flashing with 2-inch high end dams.
 - 1. Material: Galvanized steel.
 - a. Thickness: 0.0299 inch (22 gauge).

2.8 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within ½ of the range of approved samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions with installer present, to verify actual locations, dimensions, and other conditions affecting performance of work.
 - 1. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
 - 2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. General: Anchor sheet metal flashing and trim and other components of the work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
 - 1. Torch cutting of sheet metal flashing and trim is not permitted.

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SHEET METAL FLASHING

- B. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with separation coating or by other permanent separation as recommended by fabricator or manufacturers of dissimilar metals.
1. Coat sides of uncoated aluminum, stainless-steel, and lead sheet metal flashing and trim with separation coating where flashing and trim will contact wood, ferrous metal, or cementitious construction.
 2. Underlayment: Where installing metal flashing 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.
 3. Bed flanges in thick coat of asphalt roofing cement where required for waterproof performance.
- C. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.
- D. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and elastomeric sealant.
- E. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
1. Space cleats not more than 12 inches apart, except where indicated as continuous. Anchor each cleat with two fasteners. Bend tabs over fasteners.
- F. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner of intersection. Where lapped or bayonet-type expansion, provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with elastomeric sealant concealed with joints.
- G. Fasteners: Use fasteners of sizes that will penetrate not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws.
1. Galvanized or Prepainted, Metallic-Coated Steel: Use stainless steel fasteners.
 2. Aluminum: Use aluminum or stainless steel fasteners.
 3. Stainless Steel: Use stainless steel fasteners.
- H. Seal joints with elastomeric sealant as required for watertight construction.
1. Where sealant-filled joints are used, embed hooked flanges of joint members not less than 1 inch into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is moderate, between 40 and 70 deg F, set joint members for 50 percent movement either way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F.
 2. Prepare joints and apply sealants to comply with requirements in Section 07 92 00 "Joint Protection".
- I. Solder Joints: Clean surfaces to be soldered, removing oils and foreign matter. Prein edges of sheets to be soldered to a width of 1-1/2 inches except where pretinned surface would show in finished work.
1. Do not solder prepainted, metallic-coated steel and aluminum sheet.

2. Pretinning is not required for lead.
3. Do not use open-flame torches for soldering. Heat surfaces to receive solder and flow solder into joints. Fill joints completely. Completely remove flux and spatter from exposed surfaces.

3.3 ROOF DRAINAGE SYSTEM INSTALLATION

- A. General: Install sheet metal roof drainage items to produce complete roof drainage system according to SMACNA recommendations and as indicated. Coordinate installation of roof perimeter flashing with installation of roof drainage system.
- B. Hanging Gutters: Join sections with riveted and soldered joints or with lapped joints sealed with elastomeric sealant. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchored gutter brackets or straps, as indicated, spaced not more than 36 inches apart. Provide end closures and seal watertight with sealant.
 1. Fasten gutter spacers to front and back of gutter.
 2. Loosely lock straps to front gutter bead and anchor to roof deck.
 3. Anchor and loosely lock back edge of gutter to continuous eave flashing.
 4. Anchor back of gutter that extends onto roof deck with cleats spaced not more than 24 inches apart.
 5. Anchor gutter with spikes and ferrules spaced not more than 24 inches apart.
 6. Install gutter with expansion joints at locations indicated but not exceeding 50 feet apart. Install expansion joint caps.
 7. Install continuous gutter screens or gutters with noncorrosive fasteners, removable for cleaning gutters.
- C. Downspouts: Join sections with 1-1/2 inch telescoping joints. Provide fasteners as required to hold downspout in place.
 1. Provide elbows as indicated.
 2. Connect sheet metal downspouts to steel pipe downspouts as indicated.
- D. Parapet Scuppers: Install scuppers where indicated through parapet. Continuously support scupper, set to correct elevation, and seal flanges to interior wall face, over cants or tapered edge strips, and under roofing membrane.
 1. Anchor scupper closure trim flange to exterior wall and seal or solder to scupper.
- E. Conductor Heads: Anchor securely to wall with elevation of conductor head rim 1 inch below scupper or gutter discharge.
- F. Splash Pans: Install where downspouts discharge on low-sloped roofs. Set in asphalt roofing cement or elastomeric sealant compatible with roofing membrane.

3.4 ROOF FLASHING INSTALLATION

- A. General: Install sheet metal roof flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual". Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight.

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- B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in FMG Loss Prevention Data Sheet 1-49 for specified wind zone as indicated.
 - 1. Interlock bottom edge of roof edge flashing with continuous cleats anchored to substrate at 24 inch centers.
- C. Copings: Anchor to resist uplift and outward forces according to recommendations in FMG Loss Prevention Data Sheet 1-49 for specified wind zone and as indicated.
 - 1. Interlock exterior bottom edge of coping with continuous cleats anchored to substrate at 24 inch centers.
 - 2. Anchor interior leg of coping with screw fasteners and washers at 24 inch centers.
- D. Pipe or Post Counterflashing: Install counterflashing umbrella with close fitting collar with top edge flared for elastomeric sealant, extending a minimum of 4 inches over base flashing. Install stainless steel drawband and tighten.
- E. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches over base flashing. Lap counterflashing joints a minimum of 4 inches and bed with elastomeric sealant.
 - 1. Secure in waterproof manner by means of interlocking folded seam and sealant.
- F. Roof Penetration Flashing: Coordinate installation of roof penetration flashing with installation of roofing and other items penetrating roof. Install flashing as follows:
 - 1. Turn lead flashing down tightly inside vent piping, as required to provide clear, unobstructed airflow.
 - 2. Seal with elastomeric sealant and clamp flashing to pipes penetrating roof except for lead flashing on vent piping.

3.5 WALL FLASHING INSTALLATION

- A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to SMACNA recommendations and as indicated. Coordinate installation of wall flashing with installation of wall opening components such as windows, doors, and louvers.
- B. Reglets: Install reglets in accordance with manufacturer's written instructions for applicable wall construction.
- C. Openings Flashing in Frame Construction: Install continuous head, sill, and similar flashings to extend 4 inches beyond wall openings.

3.6 MISCELLANEOUS FLASHING INSTALLATION

- A. Equipment Support Flashing: Coordinate installation of equipment support flashing with installation of roofing and equipment. Weld or seal flashing with elastomeric sealant to equipment support member.

3.7 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder and sealants.

SECTION 07 62 00
SHEET METAL FLASHING

- C. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed. On completion of installation, clean finished surfaces, including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain a clean condition during construction.
- D. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar repair procedures.

END OF SECTION

SECTION 07 84 13.26
PENETRATION FIRESTOPPING (ELECTRICAL)

SECTION 078413.26 – PENETRATION FIRESTOPPING (ELECTRICAL)

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Penetrations in fire-resistance-rated walls.
 - 2. Penetrations in horizontal assemblies.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Product Schedule: For each penetration firestopping system. Include location, illustration of firestopping system, and design designation of qualified testing and inspecting agency.

1.3 CLOSEOUT SUBMITTALS

- A. Installer Certificates: From Installer indicating that penetration firestopping systems have been installed in compliance with requirements and manufacturer's written instructions.

1.4 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install penetration firestopping system when ambient or substrate temperatures are outside limits permitted by penetration firestopping system manufacturers or when substrates are wet because of rain, frost, condensation, or other causes.
- B. Install and cure penetration firestopping materials per manufacturer's written instructions using natural means of ventilations or, where this is inadequate, forced-air circulation.

1.5 COORDINATION

- A. Coordinate construction of openings and penetrating items to ensure that penetration firestopping systems can be installed according to specified firestopping system design.
- B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate penetration firestopping systems.

SECTION 07 84 13.26
PENETRATION FIRESTOPPING (ELECTRICAL)

PART 2 - PRODUCTS

2.1 PENETRATION FIRESTOPPING SYSTEMS

- A. Penetration Firestopping Systems: Systems that resist spread of fire, passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems shall be compatible with one another, with the substrates forming openings, and with penetrating items if any.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. 3M Fire Protection Products.
 - b. Hilti, Inc.
 - c. Specified Technologies, Inc.
- B. Penetrations in Fire-Resistance-Rated Walls: Penetration firestopping systems with ratings determined per ASTM E814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg.
 - 1. F-Rating: Not less than the fire-resistance rating of constructions penetrated.
 - 2. Fire rated pathway designed to allow cables to penetrate fire rated walls and floors without the need for firestopping. Built in fire and smoke sealing system that automatically adjusts to the amount of cables installed. System allows for cables to be easily added or removed at any time without the need to remove or reinstall firestopping materials.
- C. Penetrations in Horizontal Assemblies: Penetration firestopping systems with ratings determined per ASTM E814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg.
 - 1. F-Rating: At least one hour, but not less than the fire-resistance rating of constructions penetrated.
 - 2. T-Rating: At least one hour, but not less than the fire-resistance rating of constructions penetrated except for floor penetrations within the cavity of a wall.
- D. Exposed Penetration Firestopping Systems: Flame-spread and smoke-developed indexes of less than 25 and 450, respectively, per ASTM E84.
- E. Accessories: Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping system manufacturer and approved by qualified testing and inspecting agency for conditions indicated.
 - 1. Permanent forming/damming/backing materials.

2.2 FILL MATERIALS

- A. Cast-in-Place Firestop Devices: Factory-assembled devices for use in cast-in-place concrete floors and consisting of an outer sleeve lined with an intumescent strip, a flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket.

SECTION 07 84 13.26
PENETRATION FIRESTOPPING (ELECTRICAL)

- B. Latex Sealants: Single-component latex formulations that do not re-emulsify after cure during exposure to moisture.
- C. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced intumescent elastomeric sheet bonded to galvanized-steel sheet.
- D. Intumescent Putties: Nonhardening, water-resistant, intumescent putties containing no solvents or inorganic fibers.
- E. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.
- F. Mortars: Prepackaged dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogeneous mortar.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning: Before installing penetration firestopping systems, clean out openings immediately to comply with manufacturer's written instructions and with the following requirements:
 - 1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of penetration firestopping materials.
 - 2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with penetration firestopping materials. Remove loose particles remaining from cleaning operation.
 - 3. Remove laitance and form-release agents from concrete.

3.3 INSTALLATION

- A. General: Install penetration firestopping systems to comply with manufacturer's written installation instructions and published drawings for products and applications.
- B. Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings.

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PENETRATION FIRESTOPPING (ELECTRICAL)

1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not forming permanent components of firestopping.
- C. Install fill materials by proven techniques to produce the following results:
1. Fill voids and cavities formed by openings, forming materials, accessories and penetrating items to achieve required fire-resistance ratings.
 2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
 3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 FIELD QUALITY CONTROL

- A. Where deficiencies are found or penetration firestopping system is damaged or removed because of testing, repair or replace penetration firestopping system to comply with requirements.
- B. Proceed with enclosing penetration firestopping systems with other construction only after inspection reports are issued and installations comply with requirements.

END OF SECTION 078413

SECTION 07 84 13.28
PENETRATION FIRESTOPPING (FIRE ALARM)

SECTION 078413.28 – PENETRATION FIRESTOPPING (FIRE ALARM)

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Penetrations in fire-resistance-rated walls.
 2. Penetrations in horizontal assemblies.
 3. Penetrations in smoke barriers.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.3 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install penetration firestopping system when ambient or substrate temperatures are outside limits permitted by penetration firestopping system manufacturers or when substrates are wet because of rain, frost, condensation, or other causes.
- B. Install and cure penetration firestopping materials per manufacturer's written instructions using natural means of ventilations or, where this is inadequate, forced-air circulation.

1.4 COORDINATION

- A. Coordinate construction of openings and penetrating items to ensure that penetration firestopping systems can be installed according to specified firestopping system design.
- B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate penetration firestopping systems.

PART 2 - PRODUCTS

2.1 PENETRATION FIRESTOPPING SYSTEMS

- A. Penetration Firestopping Systems: Systems that resist spread of fire, passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems shall be compatible with one another, with the substrates forming openings, and with penetrating items if any.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

SECTION 07 84 13.28
PENETRATION FIRESTOPPING (FIRE ALARM)

- a. 3M Fire Protection Products.
 - b. Hilti, Inc.
 - c. Specified Technologies, Inc.
- B. Penetrations in Fire-Resistance-Rated Walls: Penetration firestopping systems with ratings determined per ASTM E814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg.
- 1. F-Rating: Not less than the fire-resistance rating of constructions penetrated.
- C. Penetrations in Horizontal Assemblies: Penetration firestopping systems with ratings determined per ASTM E814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg.
- 1. Fire rated pathway designed to allow cables to penetrate fire rated walls and floors without the need for firestopping. Built in fire and smoke sealing system that automatically adjusts to the amount of cables installed. System allows for cables to be easily added or removed at any time without the need to remove or reinstall firestopping materials.
 - a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1) STI Firestop, EZ Path, 22+
 - a) Description: The EZ Path® Series 22 Fire Rated Pathway is a pathway device designed to allow cables to penetrate fire-rated walls without the need for firestopping. This device features a built-in fire sealing system that automatically adjusts to the amount of cables installed. Once installed in a fire barrier, cables can be easily added or removed at any time without the need to remove or reinstall firestopping materials. The EZ Path® Series 22 Fire Rated Pathway consists of an enclosed heavy gauge galvanized steel pathway lined with intumescent material engineered for rapid expansion when exposed to fire or high temperatures, quickly sealing the pathway and preventing the passage of flames and smoke. EZ Path® Series 22 Fire Rated Pathway is painted safety orange for easy identification. Its compact square profile allows a maximum number of cables to be installed in a relatively small area. The pathway measures approximately 1-1/2" x 1-1/2" (37mm) and is 10-1/2" (267 mm) long.
 - b. Performance: UL Tested and Classified in accordance with ASTM E814 (UL1479) & CAN/ULC-S115. Systems are available for common floor and wall constructions with ratings up to and including 4 hours.
 - c. Gangable kits allowed.
- D. Smoke and acoustical pathways:
- a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1) STI Firestop, Series NEZ22.

SECTION 07 84 13.28
PENETRATION FIRESTOPPING (FIRE ALARM)

- b. Description: Designed to allow cables to penetrate non-rated walls and floors without the need for smoke sealing. Features a built-in smoke system that automatically adjusts to the amount of cables installed. Once installed in a barrier, cable can be added or removed without the need to remove or reinstall caulking or other materials.
 - c. All free air fire alarm cable shall utilize an enclosed smoke and acoustical pathway device wherever cables penetrate a non-fire-rated wall or floor. The pathway shall provide an achievable STC rating of greater than or equal to the STC rating of the specific underlying construction per ASTM E90-04/ASTM C919.
- E. Exposed Penetration Firestopping Systems: Flame-spread and smoke-developed indexes of less than 25 and 450, respectively, per ASTM E84.
- F. Accessories: Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping system manufacturer and approved by qualified testing and inspecting agency for conditions indicated.
- 1. Permanent forming/damming/backing materials.
 - 2. Substrate primers.
 - 3. Collars.
 - 4. Steel sleeves.

2.2 FILL MATERIALS

- A. Cast-in-Place Firestop Devices: Factory-assembled devices for use in cast-in-place concrete floors and consisting of an outer sleeve lined with an intumescent strip, a flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket.
- B. Latex Sealants: Single-component latex formulations that do not re-emulsify after cure during exposure to moisture.
- C. Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.
- D. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced intumescent elastomeric sheet bonded to galvanized-steel sheet.
- E. Intumescent Putties: Nonhardening, water-resistant, intumescent putties containing no solvents or inorganic fibers.
- F. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of the Work.

SECTION 07 84 13.28
PENETRATION FIRESTOPPING (FIRE ALARM)

- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning: Before installing penetration firestopping systems, clean out openings immediately to comply with manufacturer's written instructions and with the following requirements:
 - 1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of penetration firestopping materials.
 - 2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with penetration firestopping materials. Remove loose particles remaining from cleaning operation.
 - 3. Remove laitance and form-release agents from concrete.
- B. Prime substrates where recommended in writing by manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

3.3 INSTALLATION

- A. General: Install penetration firestopping systems to comply with manufacturer's written installation instructions and published drawings for products and applications.
- B. Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings.
 - 1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not forming permanent components of firestopping.
- C. Install fill materials by proven techniques to produce the following results:
 - 1. Fill voids and cavities formed by openings, forming materials, accessories and penetrating items to achieve required fire-resistance ratings.
 - 2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
 - 3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 FIELD QUALITY CONTROL

- A. Where deficiencies are found or penetration firestopping system is damaged or removed because of testing, repair or replace penetration firestopping system to comply with requirements.
- B. Proceed with enclosing penetration firestopping systems with other construction only after inspection reports are issued and installations comply with requirements.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Provide joint sealers, for interior and exterior joints not specified elsewhere, with backing rods and accessories as required for complete installation.
 - 1. Joint sealers include sealants and caulking as indicated.

1.2 SYSTEM DESCRIPTION

- A. Performance Requirements:
 - 1. Select materials for compatibility with joint surfaces and indicated exposures.
 - 2. Where not indicated, select modulus of elasticity and hardness or grade recommended by manufacturer for each application indicated.
 - 3. Comply with applicable limitations on volatile organic compound (VOC) emissions.

1.3 SUBMITTALS

All submittals shall be made under the provisions of Section 01 33 00.

- A. Submittal No. 07 90 00 A – Product Data
 - 1. Submit product data for all specified products.
 - 2. Submit product data indicating sealant chemical characteristics, performance criteria, limitations, and color availability.
- B. Submittal No. 07 90 00 B – Installation Instructions
 - 1. Submit manufacturer's installation instructions
 - 2. Submit manufacturer's certificate under provisions of Section 01 33 00 that products meet or exceed specified requirements.
 - 3. Furnish certification indicating installers are trained in proper use of specified products, qualified, and familiar with proper installation techniques.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Firm with minimum five years successful experience on projects of similar type and size, using specified products.
 - 1. Installers shall be familiar with proper application procedures to ensure maximum joint sealer expansion and contraction capabilities.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration period for use, cure time, and mixing instructions.

1.6 SITE CONDITIONS

- A. Do not proceed with installation of joint sealers under unfavorable weather conditions.
- B. Install elastomeric sealants when temperature is in lower third of temperature range recommended by manufacturer.
- C. Do not install solvent curing sealants in enclosed building spaces.

1.7 WARRANTY

- A. Special Warranty: Repair or replace joint sealers that fail to perform as intended, because of leaking, crumbling, hardening, shrinkage, bleeding, sagging, staining and loss of adhesion.
 - 1. Special Warranty Period: Three years.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Elastomeric Sealants:
 - 1. Single Component Low Modulus Silicone Sealant: ASTM C920 Type S, Class 25, Grade NS; minimum 50% expansion and compaction capability.
 - a. Provide at exterior locations not exposed to traffic.
 - b. Manufacturers:
 - 1) General Electric Co./Silpruf, Silglaz or GESIL.
 - 2) Dow Corning Corp./790 or 795.
 - 3) Pecora Corp./864 Architectural Silicone.
 - 4) Tremco/Spectrum 3.
 - 5) Substitutions: Refer to Section 01 62 00.
 - 2. Multi-Component Polyurethane Sealant: ASTM C920, Type M, Grade P, Class 25, self-leveling; minimum 25% expansion and compaction capability.
 - a. Provide following at traffic bearing locations.
 - b. Manufacturers:
 - 1) Pecora Corp./NR-200 Urexpan.
 - 2) Tremco/Vulkem 245.
 - 3) Sonneborn Division of ChemRex /SL 2
 - 4) Substitutions: Refer to Section 01 62 00.

**SECTION 07 92 00
JOINT PROTECTION**

3. Mildew-Resistant Silicone Rubber Sealant: ASTM C920, Type S, Grade NS, Class 25, compounded with fungicide, specifically for mildew resistance and recommended for interior joints in wet areas.
 - a. Provide at interior joints in wet areas.
 - b. Manufacturers:
 - 1) General Electric Co./SCS 1702 Sanitary Sealant.
 - 2) Dow Corning Corp./786 Bathtub Caulk.
 - 3) Pecora Corp./863 #345 White.
 - 4) Tremco/Tremsil 200.
 - 5) Substitutions: Refer to Section 01 62 00.
- B. Non-Elastomeric Sealants:
 1. Acrylic-Emulsion Sealant: ASTM C834 acrylic or latex-rubber-modified acrylic sealant, permanently flexible, non-staining and non-bleeding; recommended for general interior exposure; compatible with paints specified in Section 09 90 00.
 - a. Provide at general interior applications.
 - b. Manufacturers:
 - 1) Pecora Corp./AC-20.
 - 2) Sonneborn Division of ChemRex/Sonolac.
 - 3) Tremco/Ultrem 1500
 - 4) Substitutions: Refer to Section 01 62 00.
- C. Miscellaneous Materials:
 1. Primers/Sealers: Non-staining types recommended by joint sealer manufacturer for joint surfaces to be primed or sealed.
 2. Joint Cleaners: Non-corrosive types recommended by joint sealer manufacturer; compatible with joint forming materials.
 3. Bond Breaker Tape: Polyethylene tape as recommended by joint sealer manufacturer where bond to substrate or joint filler must be avoided for proper performance of joint sealer.
 4. Sealant Backer Rod: Compressible polyethylene foam rod or other flexible, permanent, durable non-absorptive material as recommended by joint sealer manufacturer for compatibility with joint sealer.
 - a. Oversize backer rod minimum 30% to 50% of joint opening.
- D. Colors: Provide colors indicated or as selected by Architect from manufacturer's full range of colors.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Prepare joint surfaces in accordance with ASTM C1193 and as recommended by joint sealer manufacturer.
- B. Clean joint surfaces immediately before installation of joint sealer; remove dirt, insecure materials, moisture and other substances that could interfere with bond of joint sealer.
- C. Prime or seal joint surfaces where recommended by joint sealer manufacturer; do not allow primer/sealer to spill or migrate onto adjoining surfaces.
- D. Ensure protective coatings on surfaces in contact with joint sealers have been completely stripped.

3.2 INSTALLATION

- A. Comply with manufacturer's printed instructions and ASTM C1193, except where more stringent requirements are shown or specified.
- B. Set sealant backer rods at proper depth or position in joint to coordinate with other work, including installation of bond breakers and sealant; do not leave voids or gaps between ends of backer rods.
 - 1. Do not stretch, twist, puncture or tear backer rods.
- C. Install bond breaker tape where required by manufacturer's recommendations to ensure joint sealers will perform properly.
- D. Size materials to achieve required width/depth ratios.
- E. Employ installation techniques that will ensure joint sealers are deposited in uniform, continuous ribbons without gaps or air pockets, with complete "wetting" of bond surfaces equally on opposite sides.
- F. Joint Configuration: Fill sealant joint to a slightly concave surface, slightly below adjoining surfaces, unless otherwise indicated.
- G. Where horizontal joints are between a horizontal surface and vertical surface, fill joint to form a slight cove, so that joint will not trap moisture or dirt.
- H. Install joint sealers to depths recommended by joint sealer manufacturer but within the following general limitations, measured at center (thin) section of bead.
 - 1. Horizontal Joints: 75% width with minimum depth of 3/8".
 - 2. Elastomeric Joints: 50% width with minimum depth of 1/4".
 - 3. Non-Elastomeric Joints: 75% to 125% of joint width.
- I. Spillage: Do not allow sealants or compounds to overflow or spill onto adjoining surfaces, or to migrate into voids of adjoining surfaces.
 - 1. Clean adjoining surfaces by whatever means may be necessary to eliminate evidence of spillage.

**SECTION 07 92 00
JOINT PROTECTION**

- J. Cure joint sealers in compliance with manufacturer's instructions and recommendations to obtain high early bond strength, internal cohesive strength and surface durability.
- K. Maintain finished joints free of embedded matter, ridges and sags.

3.3 CLEANING AND REPAIRING

- A. Clean all work and adjacent soiled surfaces.
- B. Repair or replace defaced or disfigured finishes caused by work of this Section.

3.4 PROTECTION OF FINISHED WORK

- A. Protect sealants until cured.

END OF SECTION

PART 1 – GENERAL

1.01 RELATED DOCUMENTS: The general conditions, Supplementary General Conditions, Special Conditions, and all applicable portions of Division 1 are by this reference a part of these specifications.

1.02 WORK INCLUDED

- A. Hollow metal doors and frames
- B. Hollow metal relites, windows, borrowed lites.
- C. All anchors and accessories
- D. Louvers in doors

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Finish painting
- B. Glass and glazing
- C. Finish Hardware
- D. Wood Doors

1.04 REFERENCE STANDARDS

- A. DHI Door Hardware Institute: "Installation Guide for Doors and Hardware"
- B. NFPA 80: Fire Doors and other opening Protectives
- C. SDI-100: Standard Steel Doors and Frames
- D. SDI-105: Recommended Erection Instructions for steel frames
- E. NFPA 101: Life Safety Code
- F. NFPA 105: Installation of Smoke Door Assemblies
- G. ADA: Americans with Disabilities Act
- H. California Building Code: California Code of Regulations, Title 24, Part 2
- I. NFPA 252: Standard Method of Fire Tests of Door Assemblies
- J. ANSI/UL10C: Standard for Safety for Positive Pressure Fire Tests of Door Assemblies

1.05 COORDINATION

- A. Coordinate work of this section with others directly affected.

1.06 QUALITY ASSURANCE

- A. The Hollow Metal Supplier shall be a manufacturer or distributor regularly engaged in supplying Hollow Metal products in this geographic area who has competent field personnel available to correct damaged, or defective manufactured products. He shall have competent personnel available to consult with the architect or contractor regarding problems, applications, or field installation problems.
- B. It is the intent of this specification to provide a general guideline for the quality, function, and design of the Hollow Metal Doors, Frames, and Relites. It is the specific responsibility of the Hollow Metal Supplier to furnish products, which are fully functional, in full compliance with State and Local Building Codes, Fire Codes, and Handicap Codes. Any supplier bidding on this section of work will notify the architect prior to bidding, of discrepancies or it will be assumed they have included correct material to make this compliance.

**SECTION 08 11 00
HOLLOW METAL DOORS, FRAMES, AND RELITES**

1.07 SUBMITTALS

All submittals shall be made under the provisions of Section 01 33 00.

- A. Submittal No. 08 11 00 A – Shop Drawings
 - 1. Submit complete shop drawings listing openings numerically by architect's opening numbers showing product construction, sizes, anchors, reinforcing, cutouts, elevations, and finish.
 - 2. Submit notes with shop drawings indicating items that vary from plans and specifications, have conflicts for label compliance, are not in compliance with standards referenced above, have door, frame, hardware or function conflicts, or require review and clarification by architect.
- B. Submittal No. 08 11 00 B – Installation Instructions
 - 1. Submit installation instructions or field delivery receipt.
 - 2. Instructions for installation, maintenance, and preparation for field painting supplied with delivery of material to jobsite.
- C. Submittal No. 08 11 00 C – Schedule: Prepared by supplier, using same reference numbers for details and openings as those on Drawings.

1.08 DELIVERY AND HANDLING

- A. All materials will be delivered to the job site undamaged with the doors properly protected by cardboard and plastic covering. Inspect Hollow Metal upon delivery. Minor damages may be repaired provided finish items are equal in all aspects to the original product, otherwise obtain replacements. Initial acceptance by the General Contractor shall signify his assumption of responsibility for job site damage.
- B. Doors and frames shall be stored in an upright position, 4 inches off the floor or ground with proper separation for air circulation and shall be stored inside or under complete weather protection. Damage not acknowledged at delivery shall be considered job site damage and the responsibility of the contractor.

1.09 WARRANTY

Hollow metal work: shall be guaranteed for a period of one (1) year after final acceptance. Any door or frame that is found to be defective during this period shall be replaced, rehung, and repainted by the contractor at no additional cost to the owner.

PART 2 - PRODUCTS

2.01 Acceptable Manufacturers

- A. Steelcraft Company
- B. Curries Company
- C. Ceco Door Products
- D. Substitutions will be considered under Section 01 62 00.

2.02 Frames, Window, Relites

- A. Frames shall be cold rolled, stretcher leveled, prime quality steel.
- B. Exterior frames and frames with less than 2" face shall be 14 gauge, galvanized G90.
- C. Interior frames 14 gauge, (galvanized per ASTM A924 A60 when installed in grouted walls.)
- D. Frames shall be back welded, square, accurately sized and have a welded shipping bar at the base for field removal.

**SECTION 08 11 00
HOLLOW METAL DOORS, FRAMES, AND RELITES**

- E. Frames shall be fully prepped, drilled and tapped for mortise hardware and properly reinforced for surface hardware as follows:
 - 1. Hinges: Minimum 7 gauge, 1-1/2" x 9" with plaster guard 1/8 x 1-1/2 full height for continuous hinges. At exterior doors, provide High Frequency reinforcement at top hinges
 - 2. Strikes: Minimum 12 gauge with plaster guard.
 - 3. Surface Hardware: Minimum 1/8" plate.
 - 4. Closers: Provide 1/8" welded in standard arm and parallel arm closer reinforcing on all frames
 - 5. Pivots: Minimum 1/4" plate.
 - 6. Prepare and install silencers (three per strike jamb two per head) stick on type not acceptable.
 - 7. Electrified Hardware: include all necessary template preparation. Doorframes include an electrical box backing with conduit run to the top or bottom of the frame as required.

- F. Anchors - Provide welded in anchors as specifically shown on plans and details. If not specifically detailed furnish anchors that are appropriate, will result in a satisfactory installation, are properly sized for the wall condition, and comply with the manufacturers recommendation. Furnish the following minimum quantities: Two base anchors six jamb anchors - (Up to 7'0" high add an additional anchor for each 24" or less).

2.03 DOORS

- A. Fabricate doors from cold rolled, stretcher leveled, prime quality steel to sizes and designs as noted in the plans.

- B. Door shall have full flush faces. Door edges shall be Fully Welded Seamless.

- C. Door core shall be "Steel Stiffened" type with 20 gage hat channels 6" on center welded to both faces. Completely fill all internal voids with an inert materials to sound deaden and insulate the door.

- D. Acceptable Manufactures and doors.
Steelcraft "B" Door
Ceco Corporation "Medallion"
Curries Company "747"

- E. Reinforcement
 - 1. Hinges: minimum 7 gauge 1-1/4" x 9" or 12 gage full height hinge channel. Provide full height reinforcing for continuous hinges
 - 2. Locks: minimum 16 gauge
 - 3. Surface Hardware: Minimum 14 gauge
 - 4. Panics: fully reinforced thru bolting not acceptable
 - 5. Closers: provide reinforcing in all doors
 - 6. Top & Bottom reinforcement channels shall be 14 gage-galvanized spot-welded to both face panels. or 16ga for doors with full height channel stile construction.
 - 7. Electrified Hardware: include all necessary template preparation including face function and attachment holes, include wire chase with pull string.

- F. Construction: All out swinging exterior doors shall have flush sealed top caps. Doors will be fully reinforced for all hardware to be surface applied and no hardware will be screwed to the surface skin of the door except kick plates, edging, push plates or nameplates.

- G. If a door must be altered by sizing, cutouts, clearances, or notching to accommodate special conditions the door shall be adequately reinforced by welded channel or other means to insure full door life without delaminating, warping, or sagging.

- H. Full glass doors (40% or more door face in glass) full channel reinforce the cut out.

- I. Face Gauges
 - 1. Doors with full height hinge channel 16 gauge.
 - 2. Doors with hinge plate reinforcing 14 gauge.
 - 3. Exterior doors to be galvanized (G90).

**SECTION 08 11 00
HOLLOW METAL DOORS, FRAMES, AND RELITES**

J. Door Design, Clearances

1. Doors shall be beveled 1/8" in 2" both edges
2. Hinge and strike clearance: 3/32"
3. Head: 1/8"
4. Floor: (unless otherwise noted) 1/2".
5. Meeting stiles: 3/32"
6. Glazed Openings: Provide door manufactures standard beveled metal stop. The secure side shall be fixed to door. The hollow metal supplier shall assume responsibility for insuring that glazing stops do not conflict with flat bar panics.
7. Louvers: where scheduled shall be "Anemostat PLSL." at exterior locations they shall be galvanized with galvanized bug screen and tamper proof fasteners. Louver cutouts shall be full reinforced with channels welded to door faces.

2.04 FINISHES:

- A. Doors and frames shall be thoroughly cleaned, bonderized or phosphatized, and finished with one coat of baked on rust-inhibiting primer. Any fabrications, cutouts or repairs shall be finished in a manner to equal this finish. Prime paint shall be tested and certified to pass a 200 hour salt spray test and a 500 hour humidity test. The contractor shall repair any minor job site or shipping damage to the paint surface immediately and the surface shall be sanded smooth and adequately primed prior to finish painting to insure a smooth flat surface. Field sanding of baked on primer must be performed to insure finish paint adhesion.

3.00 INSTALLATION

- A. The contractor shall have in his employment, persons fully experienced and qualified to install the hollow metal doors and frames. Reference "Installation Guide for Doors and Hardware" as a guideline to minimum acceptable practice. Jambs and heads to be installed absolutely plumb and true with jamb in the same plane. Frames in masonry openings must have a least two job installed spreaders to avoid bowing. Base anchors must be used on all frames. Properly shim and adjust hinges to achieve a uniform margin between door and frame. Do not bend hinges to adjust door.
- B. All functional hardware items must be installed by drilling and taping the concealed reinforcement for manufacture furnished fasteners. Installation using tek type screws will not be acceptable.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Heavy Commercial Fixed Windows. HC75. 2 1/4" Depth. Thermally Broken. Suitable for outside glazing.

1.2 REFERENCES

A. ASTM International (ASTM):

1. ASTM E 283 - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
2. ASTM E 330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
3. ASTM E 331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
4. ASTM E 987 - Standard Test Methods for Deglazing Force of Fenestration Products.
5. ASTM E 2068 - Standard Test Method for Determination of Operating Force of Sliding Windows and Doors
6. ASTM F 588 - Standard Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding Glazing Impact.

B. American Architectural Manufacturers Association (AAMA): AAMA/WDMA/CSA 101/I.S.2/A440 - Standard/Specification for Windows, Doors and Unit Skylights.

C. American Architectural Manufacturers Association (AAMA): AAMA 609 - Cleaning and Maintenance Guide for Architecturally Finished Aluminum.

D. American National Standards Institute (ANSI): ANSI/AAMA 101.88 - Voluntary Specifications for Aluminum Prime Windows and Sliding Glass Doors.

E. Glass Association of North America (GANA): GANA 01-0300 - Proper Procedures for Cleaning Architectural Glass Products.

1.3 SUBMITTALS

All submittals shall be submitted under the provisions of Section 01 33 00.

A. Submittal 08 52 00 A - Product Data: Manufacturer's data sheets on each product to be used, including:

1. Certified test laboratory reports to show compliance with requirements.
2. Manufacturer's standard head, jamb and sill details.
3. Installation methods.
4. Cleaning and maintenance instructions.

B. Submittal 08 52 00 B - Shop Drawings: Provide shop drawings indicating details of construction and installation including but not limited to window location chart, window schedule, size, muntin type and design, window elevations, sections and

details of multiple window assemblies, hardware, glazing details and interface with adjacent construction.

- C. Submittal 08 52 00 C - Verification Samples: For each product specified, two samples, representing colors and finishes to be installed.
- D. Submittal 08 52 00 D - Manufacturer's Certificates: Submit certified independent testing agency reports indicating window units meet or exceed specified performance requirements.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Minimum 5 years' experience in producing aluminum windows of the type specified.
 - 1. Manufacturer must be certified through the PPG Certified Window Fabricator and the Guardian Select Window Fabricator programs.
- B. Installer Qualifications: Minimum 2 years' experience installing similar windows.
- C. Performance: Comply with AAMA standards and ANSI/AAMA 101.88.
- D. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
 - 1. Finish areas designated by Architect.
 - 2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
 - 3. Modify mock-up as required to produce acceptable work.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle materials and products in strict compliance with manufacturer's instructions and recommendations and industry standards. Protect from damage.

1.6 SEQUENCING AND SCHEDULING

- A. Conference: Convene a pre-installation conference to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work.

1.7 WARRANTY

- A. Warranty: Provide manufacturer's standard limited warranty for materials and workmanship.
 - 1. Aluminum Window Warranty Period: 1 year.
 - 2. Standard Insulating Glass Warranty Period: 10 years

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: All Weather Architectural Aluminum, which is located at: 777 Aldridge Rd. ; Vacaville, CA 95688; Tel: 707-452-1600; Fax: 707-452-1616 ; Email: [request info \(jim@allweatheraa.com\)](mailto:request info (jim@allweatheraa.com)); Web: www.allweathersweb.com

- B. Requests for substitutions will be considered in accordance with provisions of Section 01 62 00.
- 2.2 SERIES 5000 THERMAL BREAK ALUMINUM WINDOWS WITH 2-1/4 INCH FRAME DEPTH; FILL AND DEBRIDGE
- A. Aluminum Windows: Fill and debridge, Series 5000 as manufactured by All Weather Architectural Aluminum Inc.
 - 1. Window Type:
 - a. Fixed window, with Nail Fin Frame. Locations as shown in drawings.
 - b. Fixed window, with Equal Leg with Comp Channel. Locations as shown in drawings.
 - 2. Compliance: FW-HC75
 - 3. Construction:
 - a. Integral Extrusion Walls:
 - 1) Wall Thickness: 0.094 inches (2.39 mm).
 - 2) Nominal Web Thickness: 1/8 inch.
 - b. Lite is retained from the exterior.
 - c. Full perimeter aluminum snap in glazing stops.
 - d. Full length pull in flat vinyl gasket.
 - e. Corners of Frame and Ventilators: Mitered and welded; muntin and intermediate bars attached to cross joints and abutting sash sections.
 - 4. Thermal Break: Pour and debridge, two part polyurethane.
 - 5. Weatherstripping: Two rows of santoprene, 64A durometer black bulbinsert inserted in extruded slot at perimeter of vent and opening; replaceable in field.
- 2.3 FINISHES
- A. Single Color Frames:
 - 1. Standard/Stock Finish: Class I Bronze or Clear Anodized Finish

PART 3 EXECUTION

3.1 PREPARATION

- A. Do not proceed with installation until substrates have been properly prepared and deviations from manufacturer's recommended tolerances are corrected. Commencement of installation constitutes acceptance of conditions.
- B. Prepare substrates using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
 - 1. Verify that openings are dimensionally correct and within allowable tolerances and substrates are plumb, level, and clean.
 - 2. Verify that anchoring surface is in accordance with approved shop drawings.
- C. If preparation is the responsibility of another installer, notify Architect in writing of deviations from manufacturer's recommended installation tolerances and conditions.

3.2 INSTALLATION

**SECTION 08 52 00
ALUMINUM WINDOWS**

- A. Install in accordance with manufacturer's written instructions and recommendations. Adjust for proper operation after installation.

3.3 FIELD QUALITY CONTROL

- A. Repair or replace window units not meeting specified performance requirements; re-test an equal quantity of windows.

3.4 CLEANING AND PROTECTION

- A. Cleaning:
 - 1. Clean sealants, caulking, and other materials from surfaces, including adjacent work.
 - 2. Clean window frames, casings, and glass using materials and methods recommended by the window and glass manufacturer that do not cause defacement of work.
 - 3. Clean using methods which comply with AAMA 609.
 - 4. Clean glass using methods which comply with GANA 01-0300.
- B. Protect installed products until completion of project.
- C. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes commercial door hardware for the following:
1. Swinging doors.
 2. Sliding doors.
 3. Other doors to the extent indicated.
- B. Door hardware includes, but is not necessarily limited to, the following:
1. Mechanical door hardware.
 2. Cylinders specified for doors in other sections.
- C. Related Sections:
1. Division 08 Section "Door Hardware Schedule".
 2. Division 08 Section "Hollow Metal Doors and Frames".
- D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
 2. ICC/CBC – California Building Code.
 3. CEC - California Electrical Code.
 4. NFPA 80 - Fire Doors and Windows.
 5. NFPA 101 - Life Safety Code.
 6. NFPA 105 - Installation of Smoke Door Assemblies.
 7. State Building Codes, Local Amendments.
- E. Standards: All hardware specified herein shall comply with the following industry standards:
1. ANSI/BHMA Certified Product Standards - A156 Series
 2. UL10C – Positive Pressure Fire Tests of Door Assemblies

1.3 SUBMITTALS

- A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

- B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
 2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
 3. Content: Include the following information:
 - a. Type, style, function, size, label, hand, and finish of each door hardware item.
 - b. Manufacturer of each item.
 - c. Fastenings and other pertinent information.
 - d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
 - e. Explanation of abbreviations, symbols, and codes contained in schedule.
 - f. Mounting locations for door hardware.
 - g. Door and frame sizes and materials.
 - h. Warranty information for each product.
 4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
- C. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.
- D. Informational Submittals:
1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.
- E. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Submittals.

1.4 QUALITY ASSURANCE

- A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.
- B. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- C. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.
- D. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.
 - 1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.
- E. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.
- F. California Building Code: Provide hardware that complies with CBC Section 11B.
 - 1. All openings as a part of an accessible route shall comply with CBC Section 11B-404.
 - 2. The clear opening width for a door shall be 32" minimum. For a swinging door it shall be measured between the face of the door and the stop, with the door open 90 degrees. There shall be no projections into it below 34" and 4" maximum projections into it between 34" and 80" above the finish floor or ground. Door closers and stops shall be permitted to be 78" minimum above the finish floor or ground. CBC Section 11B-404.2.3.
 - 3. Operable hardware on accessible doors shall comply with CBC Section 11B-309.4 and shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. Operable parts of such hardware shall be 34" minimum and 44" maximum above finish floor or ground. Where sliding doors are in the fully open position, operating hardware shall be exposed and usable from both sides.
 - 4. Hardware (including panic hardware) shall not be provided with "nightlatch" function for any accessible doors or gates unless the following conditions are met:
 - a. Such hardware has a 'dogging' feature and is dogged during the time the facility is open.
 - b. All 'dogging' operation is performed only by employees as their job function (non-public use).
 - 5. The force for pushing or pulling open a door shall be in accordance with CBC Section 11B-404.2.9.
 - a. Interior hinged doors, sliding or folding doors, and exterior hinged doors: 5 pounds (22.2 N) maximum. Required fire doors: the minimum opening force allowable by the DSA authority, not to exceed 15 pounds (66.7N). These

forces do not apply to the force required to retract latch bolts or disengage other devices that hold the door in a closed position.

- b. The force required for activating any operable parts, such as lever hardware, or disengaging other devices shall be 5 pounds (22.2N) maximum to comply with CBC Section 11B-309.4.
 6. Door closing speed shall comply with CBC Section 11B-404.2.8. Closers shall be adjusted so that the required time to move a door from an open position of 90 degrees to a position of 12 degrees from the latch is 5 seconds minimum. Spring hinges shall be adjusted so that the required time to move a door from an open position of 70 degrees to the closed position is 1.5 seconds minimum.
 7. Floor stops shall not be located in the path of travel and 4" maximum from walls.
 8. Thresholds shall comply with CBC Section 11B-404.2.5.
- G. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:
1. Function of building, purpose of each area and degree of security required.
 2. Plans for existing and future key system expansion.
 3. Requirements for key control storage and software.
 4. Installation of permanent keys, cylinder cores and software.
 5. Address and requirements for delivery of keys.
- H. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.
1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
 2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
 3. Review sequence of operation narratives for each unique access controlled opening.
 4. Review and finalize construction schedule and verify availability of materials.
 5. Review the required inspecting, testing, commissioning, and demonstration procedures
- I. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

- B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.
- C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.6 COORDINATION

- A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.
- B. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.7 WARRANTY

- A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:
 - 1. Structural failures including excessive deflection, cracking, or breakage.
 - 2. Faulty operation of the hardware.
 - 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 4. Electrical component defects and failures within the systems operation.
- C. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.
- D. Special Warranty Periods:
 - 1. Seven years for heavy duty cylindrical (bored) locks and latches.
 - 2. Five years for exit hardware.

1.8 MAINTENANCE SERVICE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

- A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.
- B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:
 - 1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.
- C. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.2 HANGING DEVICES

- A. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.
 - 1. Quantity: Provide the following hinge quantity:
 - a. Two Hinges: For doors with heights up to 60 inches.
 - b. Three Hinges: For doors with heights 61 to 90 inches.
 - c. Four Hinges: For doors with heights 91 to 120 inches.
 - d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.
 - 2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:
 - a. Widths up to 3'0": 4-1/2" standard or heavy weight as specified.
 - b. Sizes from 3'1" to 4'0": 5" standard or heavy weight as specified.
 - 3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
 - a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
 - b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.
 - 4. Hinge Options: Comply with the following:

- a. Non-removable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out-swinging lockable doors.

5. Manufacturers:

- a. Hager Companies (HA).
- b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK).
- c. Stanley Hardware (ST).

2.3 CYLINDERS AND KEYING

- A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.
- B. Source Limitations: Obtain each type of keyed cylinder and keys from the same source manufacturer as locksets and exit devices, unless otherwise indicated.
- C. Cylinders: Original manufacturer cylinders complying with the following:
 1. Mortise Type: Threaded cylinders with rings and cams to suit hardware application.
 2. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
 3. Bored-Lock Type: Cylinders with tailpieces to suit locks.
 4. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
 5. Keyway: Match Facility Standard.
- D. Keying System: Each type of lock and cylinders to be factory keyed.
 1. Conduct specified "Keying Conference" to define and document keying system instructions and requirements.
 2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
 3. Existing System: Key locks to Owner's existing system.
- E. Key Quantity: Provide the following minimum number of keys:
 1. Change Keys per Cylinder: Two (2)
 2. Master Keys (per Master Key Level/Group): Five (5).
 3. Construction Keys (where required): Ten (10).
- F. Construction Keying: Provide construction master keyed cylinders.

2.4 MECHANICAL LOCKS AND LATCHING DEVICES

- A. Cylindrical Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.2, Series 4000, Grade 1 certified.

1. Furnish with solid cast levers, standard 2 3/4" backset, and 1/2" (3/4" at rated paired openings) throw brass or stainless steel latchbolt.
2. Locks are to be non-handed and fully field reversible.
3. Manufacturers:
 - a. Schlage (SC) – ND Series.

2.5 LOCK AND LATCH STRIKES

- A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
 1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
 2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
 3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
 4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.
- B. Standards: Comply with the following:
 1. Strikes for Mortise Locks and Latches: BHMA A156.13.
 2. Strikes for Bored Locks and Latches: BHMA A156.2.
 3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
 4. Dustproof Strikes: BHMA A156.16.

2.6 CONVENTIONAL EXIT DEVICES

- A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:
 1. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.
 2. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer's catalog and template book for specific requirements.
 3. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.

4. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.
 5. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty escutcheon trim with threaded studs for thru-bolts.
 - a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.
 - b. Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.
 6. Vertical Rod Exit Devices: Where surface or concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dust proof strikes where thermal pins are required to project into the floor.
 7. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2" wide stiles.
 8. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.
 9. Rail Sizing: Provide exit device rails factory sized for proper door width application.
 10. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.
- B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 certified panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets. Exit device latch to be stainless steel, pullman type, with deadlock feature.
1. Manufacturers:
 - a. Von Duprin (VD) - 35A/98 XP Series.

2.7 DOOR CLOSERS

- A. All door closers specified herein shall meet or exceed the following criteria:
1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers including installation and adjusting information on inside of cover.
 2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
 3. Cycle Testing: Provide closers which have surpassed 15 million cycles in a test witnessed and verified by UL.
 4. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of

use. Where closers are indicated for doors required to be accessible to the physically handicapped, provide units complying with ANSI ICC/A117.1.

5. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
 6. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.
 7. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.
- B. Door Closers, Surface Mounted (Heavy Duty): ANSI/BHMA A156.4, Grade 1 surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control. Provide non-handed units standard.
1. Manufacturers:
 - a. Norton Door Controls (NO) - 7500 Series.
- C. Door Closers, Surface Mounted (Cam Action): ANSI/BHMA 156.4, Grade 1 certified surface mounted, high efficiency door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be of the cam and roller design, one piece cast aluminum silicon alloy body with adjustable backcheck and independently controlled valves for closing sweep and latch speed.
1. Manufacturers:
 - a. Norton Door Controls (NO) - 2800ST Series.

2.8 DOOR STOPS AND HOLDERS

- A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.
- B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.
1. Manufacturers:
 - a. Hiawatha, Inc. (HI).
 - b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
 - c. Trimco (TC).

2.9 ARCHITECTURAL SEALS

- A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.
- B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.
 - 1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.
- C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.
 - 1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NPFA 252, Standard Methods of Fire Tests of Door Assemblies.
- D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.
- E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.
- F. Manufacturers:
 - 1. National Guard Products (NG).
 - 2. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).
 - 3. Reese Enterprises, Inc. (RE).

2.10 FABRICATION

- A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.11 FINISHES

- A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.
- B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware

- C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

- A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.
- B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 INSTALLATION

- A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.
 - 1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.
- B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
 - 1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
 - 2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
 - 3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
 - 4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.
- C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9

Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

- D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."
- E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 FIELD QUALITY CONTROL

- A. Field Inspection: Supplier will perform a final inspection of installed door hardware and state in report whether work complies with or deviates from requirements, including whether door hardware is properly installed, operating and adjusted.

3.5 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.6 CLEANING AND PROTECTION

- A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.
- B. Clean adjacent surfaces soiled by door hardware installation.
- C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

- A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SETS

- A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a

hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

- B. The supplier is responsible for handing and sizing all products and providing the correct option for the appropriate door type and material where more than one is presented in the hardware sets. Quantities listed are for each pair of doors, or for each single door.

Hardware Sets

Set: 1.0

Doors: [A128B](#)

6 Hinge (heavy weight)	T4A3386 NRP	US32D	MK
1 Mullion	KR4954	SP28	VD
1 Rim Exit Device	CD 99NL	US26D	VD
1 Rim Exit Device	CD 99EO	US26D	VD
4 Cylinder	Match Facility Standard		
2 Door Closer	PR7500	689	NO
2 Kick Plate	K1050 10" x 2LDW BEV CSK	US32D	RO
2 Door Stop	463	US32D	RO
1 Threshold	Per Detail x FHSL14	AI	PE
1 Gasket	S44D Head & Jambs		PE
1 Gasket	5110BL (mullion)		PE
2 Sweep	57AV		PE

Set: 2.0

Doors: [A145A](#), [A146A](#), [A151A](#), [A152A](#)

3 Hinge (heavy weight)	T4A3386	US32D	MK
1 Cylindrical Lock (classroom)	ND70 P D RHO	626	SC
1 Cylinder	Match Facility Standard		
1 Surface Closer	2800ST	689	NO
1 Kick Plate	K1050 10" x 2LDW BEV CSK	US32D	RO
1 Wall Stop	406	US32D	RO
1 Threshold	Per Detail x FHSL14	AI	PE
1 Sweep	345CNB		PE

Set: 3.0

Doors: [A136C](#)

3 Hinge (heavy weight)	T4A3786	US26D	MK
1 Classroom Security Lock	ND75 P D RHO	626	SC
1 Electric Strike	1500C	630	HS <input type="checkbox"/>
1 Smart Pak	2005M3		HS
1 Door Closer	PR7500	689	NO
1 Kick Plate	K1050 10" x 2LDW BEV CSK	US32D	RO

1 Wall Stop	406	US32D	RO
1 Gasket	S44D Head & Jambs		PE
1 Push Button	PB3		SU <input type="checkbox"/>
1 Power Supply	BPS-24-1		SU <input type="checkbox"/>

Notes: Door normally closed and locked. Push button at receptionist desk releases electric strike, allowing entry. Free egress at all times. Classroom security function lockset can be unlocked if free ingress is needed.

C. California Building Code: Provide hardware that complies with CBC Section 11B.

1. All openings as a part of an accessible route shall comply with CBC Section 11B-404.
2. The clear opening width for a door shall be 32" minimum. For a swinging door it shall be measured between the face of the door and the stop, with the door open 90 degrees. There shall be no projections into it below 34" and 4" maximum projections into it between 34" and 80" above the finish floor or ground. Door closers and stops shall be permitted to be 78" minimum above the finish floor or ground. CBC Section 11B-404.2.3.
3. Operable hardware on accessible doors shall comply with CBC Section 11B-309.4 and shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. Operable parts of such hardware shall be 34" minimum and 44" maximum above finish floor or ground. Where sliding doors are in the fully open position, operating hardware shall be exposed and usable from both sides.
4. Hardware (including panic hardware) shall not be provided with "nightlatch" function for any accessible doors or gates unless the following conditions are met:
 - a. Such hardware has a 'dogging' feature and is dogged during the time the facility is open.
 - b. All 'dogging' operation is performed only by employees as their job function (non-public use).
5. The force for pushing or pulling open a door shall be in accordance with CBC Section 11B-404.2.9.
 - a. Interior hinged doors, sliding or folding doors, and exterior hinged doors: 5 pounds (22.2 N) maximum. Required fire doors: the minimum opening force allowable by the DSA authority, not to exceed 15 pounds (66.7N). These forces do not apply to the force required to retract latch bolts or disengage other devices that hold the door in a closed position.
 - b. The force required for activating any operable parts, such as lever hardware, or disengaging other devices shall be 5 pounds (22.2N) maximum to comply with CBC Section 11B-309.4.
6. Door closing speed shall comply with CBC Section 11B-404.2.8. Closers shall be adjusted so that the required time to move a door from an open position of 90 degrees to a position of 12 degrees from the latch is 5 seconds minimum. Spring hinges shall be

adjusted so that the required time to move a door from an open position of 70 degrees to the closed position is 1.5 seconds minimum.

7. Floor stops shall not be located in the path of travel and 4" maximum from walls.
8. Thresholds shall comply with CBC Section 11B-404.2.5.

END OF SECTION 087100

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Provide miscellaneous glass and glazing for aluminum window frames and hollow metal doors not provided elsewhere including accessories as required for complete installation.

1.2 REFERENCES

- B. Glass Association of North America (GANA): Glazing Manual and Sealant Manual.

1.3 SYSTEM DESCRIPTION

- A. Safety Glass Standard: CPSC 16 CFR 1201, ANSI Z97.1, and California Building Code Chapter 24.
- B. Fire Rated Glass: Provide glass identical to glass tested per ASTM E163, labeled and listed by UL or other testing and inspection agency acceptable to applicable authorities.

1.4 SUBMITTALS

All submittals shall be submitted under the provisions of Section 01 33 00.

- A. Submittal No. 08 80 00.19 A - Product Data: Furnish for each type of glass, and each type of exposed glazing material.
- B. Submittal No. 08 80 00.19 B - Samples: Furnish samples 12 x 12 inches in size, illustrating glass coloration of each type required.

1.5 WARRANTY

- A. Special Warranties:
 - 1. Special Warranty Period: Two years.

PART 2 – PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Vitro Architectural Glass (formerly PPG Glass)
- B. Substitutions: Refer to Section 01 62 00.

2.2 MATERIALS

- A. Insulated Glazing System: **¼” Solarcool on Solarbronze outside lite, ½” air space, ¼” Solarban 90 on Clear inside lite.**
 - 1. Testing Standards:

**SECTION 08 80 00
GLAZING**

- a. Air Infiltration: The test specimen shall be tested in accordance with ASTM E 283. Air infiltration rate shall not exceed 0.06 cfm/ft² at a static air pressure differential of 6.24 psf.
 - b. Water Resistance: The test specimen shall be tested in accordance with ASTM E 331. There shall be no leakage at a minimum static air pressure differential of 8 psf as defined in AAMA 501.
 - c. Thermal Transmittance (U-factor): When tested to AAMA Specification 1503, the thermal transmittance (U-factor) shall not be more than:
 - 1) Glass to Exterior – 0.47 (low-e) BTU/hr/ft²/°F.
 - 2) Glass to Center – 0.44 (low-e) BTU/hr/ft²/°F.
 - 3) Glass to Interior – 0.41 (low-e) BTU/hr/ft²/°F.
 - d. Condensation Resistance (CRF): When tested to AAMA Specification 1503, the condensation resistance factor shall not be less than:
 - 1) Glass to Exterior – 70 frame and 69glass (low-e) or 69 frame and 58 glass (clear).
 - 2) Glass to Center – 62 frame and 68glass (low-e) or 63 frame and 56 glass (clear).
 - 3) Glass to Interior – 56 frame and 67 glass (low-e) or 54 frame and 58 glass (clear).
2. Location at all exterior windows and door sidelights.
- B. Glazing Sealant: ASTM C920, Type S, Grade NS, elastomeric one-component silicone glazing sealants as recommended by sealant manufacturer for application involved.
1. Manufacturers:
 - a. Dow Corning Corp.
 - b. General Electric Co.
 - c. Pecora Corp.
 - d. Substitutions: Refer to Section 01 62 00.
 2. Color: As selected by Architect from manufacturer's full range of available colors.
- C. Setting Blocks: 70-90 durometer hardness; 4" long by 3/8" thick by 1/4" high standard setting blocks.
- D. Spacer Shims: Silicone compatible, 50 durometer hardness; 3" long by 3/32" thick by 1/4" high.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean glazing channels and framing members to receive glass immediately before glazing; remove coatings not firmly bonded to substrate.
- B. Apply primer to joint surfaces where recommended by sealant manufacturer.

3.2 INSTALLATION

- A. Comply with GANA Glazing Manual and Sealant Manual and glazing manufacturer instructions.
 - 1. Do not allow glass to touch metal surfaces.
 - 2. Comply with NFPA 80 for glass in fire rated openings.
- B. Place setting blocks at quarter points in thin course of sealant.
- C. Install removable stops with glass centered in space with spacer shims at 2'-0" intervals on both sides of glass, 1/4" below sightline.
- D. Sealant at Glazing: Fill gap between glass and stops with sealant to depth equal to bite of frame on glass but not more than 3/8" below sightline.
 - 1. Apply sealant to uniform and level line, flush with sightline; tool or wipe sealant surface for smooth appearance; at exterior locations tool sealant so water is carried away from glass.

3.3 CLEANING

- A. Mark glass after installation by crossed streamers attached to framing and held away from glass; do not apply markers to surface of glass.
- B. Remove nonpermanent labels immediately after sealant cures; cure sealants for high early strength and durability.
- C. Remove and replace glass that is broken, chipped, cracked, abraded or damaged during construction period, including damage by natural causes, accidents and vandalism.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Provide gypsum board systems including gypsum board, joint treatment, acoustical accessories, and general accessories for complete installation.

1.2 REFERENCES

- A. ASTM C754: Installation of Steel Framing Members to Receive Screw-Attached Gypsum Wallboard, Backing Board, or Water-Resistant Backing Board.
- B. ASTM C840: Application and Finishing of Gypsum Board.

1.3 SYSTEM DESCRIPTION

- A. Performance Requirements: Perform gypsum board systems work in accordance with recommendations of ASTM C754 and ASTM C840 unless otherwise specified.
 - 1. Loads: Comply with California Building Code requirements for design of metal framing for gypsum board systems.
 - a. Deflection: Maximum L/240 typical, L/360 where plaster or tile is indicated.
 - 2. Seismic Requirements: Comply with code requirements for seismic bracing.
- B. Fire-Rated Assemblies: Listed by Underwriter's Laboratory (UL), Gypsum Association (GA) File No's in 2006 Fire Resistance Design Manual, California Building Code Table 721.1 or other listing approved by applicable authorities.
- C. Systems Responsibility: Provide products manufactured by or recommended by manufacturer of gypsum board to maintain single-source responsibility for system.
- D. Openings: Obtain dimensions and locations from other trades and provide openings and enclosures for accessories, specialties, equipment, and ductwork.

1.4 SUBMITTALS

All submittals shall be made under the provisions of Section 01 33 00.

- A. Submittal No. 09 21 16A – Product Data
 - 1. Provide product data on metal framing, gypsum board, joint tape, and decorative finish.
 - 2. Furnish manufacturer's certification indicating products comply with Contract Documents and applicable codes.

1.5 PROJECT CONDITIONS

- A. Do not begin installation of interior gypsum board until space is enclosed, space is not exposed to other sources of water, and space is free of standing water.

**SECTION 09 21 16
GYPSUM BOARD ASSEMBLIES**

- B. Maintain areas to receive gypsum board at minimum 50 degree F for 48 hours prior to application and continuously after application until drying of joint compound is complete; comply with ASTM C840.
- C. Immediately remove from site gypsum board for interior use exposed to water, including gypsum board with water stains, with signs of mold, and gypsum board with mildew.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. United States Gypsum Co., USG Corp.
- B. Georgia-Pacific Corp.
- C. National Gypsum Co.
- D. Substitutions: Refer to Section 01 62 00.

2.2 MATERIALS

- A. Gypsum Board - Standard
 - 1. ASTM C1396, TYPE X, FIRE RATED, 5/8" thick paper faced gypsum panels with tapered edges.
- B. Moisture Resistant Gypsum Board
 - 1. Equal to Georgia Pacific Corp. "Dens-Armor Plus High Performance" 5/8" thick fiberglass faced, treated gypsum panels with tapered edges. Fire rated Type X.
- C. Tile backer board specified under Section 09 30 00.
- H. Gypsum Board Accessories: Comply with ASTM C840.
 - 1. Gypsum board sealer: Provide one Coat "Hamilton Prep Coat Plus" prior to application of gypsum board texture.
 - 2. Provide protective coated steel corner beads and edge trim; type designed to be concealed in finished construction by tape and joint compound.
 - 3. Corner Beads: Manufacturer's standard metal beads.
 - 4. Edge Trim: "J", "L", "LK", or "LC" casing beads – manufacturer's standard.
 - 5. Reinforcing Tape, Joint Compound, Adhesive, Water, Fasteners: Types recommended by system manufacturer and conforming to ASTM C475.
 - a. Typical Joint Compound: Chemical hardening type for bedding and filling, ready-mixed or powder vinyl type for topping.
 - 6. Control Joints: Back to back casing beads.

**SECTION 09 21 16
GYPSUM BOARD ASSEMBLIES**

- a. Back control joints with 4 mil thick polyethylene air seal.
 - I. Gypsum Board Texture: Equal to USG "Sheetrock Brand" ready mixed wall and ceiling spray Texture, medium orange peel.
- 2.3 Acoustic Sealant: Serious Energy "Quiet Seal Pro", non-hardening, gun grade sealant per ASTM C834.

PART 3 - EXECUTION

- A. Gypsum Board Installation: Install in accordance with ASTM C840 and manufacturer's recommendations.
 - 1. Use screws when fastening gypsum board to furring and to framing.
 - 2. Erect gypsum board with ends and edges occurring over firm bearing.
 - a. Ensure joints of second layer do not occur over joints of first layer in double layer applications.
 - 3. For fire rated systems comply with requirements for fire ratings.
 - a. Provide "five-sided" gypsum board boxes at all breaches in the envelope of fire rated wall or ceiling assemblies larger than 16 square inches. Some items causing this condition may be electrical receptacles or switches, recessed lights, fire extinguishers, medical gas outlets, equipment panels, recessed film illuminators, etc.
 - 4. Place corner beads at external corners; use longest practical lengths.
 - 5. Place edge trim where gypsum board abuts dissimilar materials.
 - 6. Tape, fill, and sand exposed joints, edges, corners and openings to produce surface ready to receive finishes; feather coats onto adjoining surfaces.
 - 7. Finishing: Comply with Gypsum Association (GA) "Levels of Gypsum Board Finish".
 - a. GA Level 4 (Typical): Provide three coat finishing and sanding is required for surfaces indicated to be painted; provide flush, smooth joints and surfaces ready for applied paint finishes.
 - b. Texture:
 - 1) At walls to be painted – provide medium orange peel spray texture.
 - 8. Remove and replace defective work.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Provide ceramic, quarry, stone, and porcelain tile installations with accessories, as required for complete installation.
 - 1. Provide cementitious backer unit tile substrate.
 - 2. Provide epoxy thin set tile walls.
 - 3. Provide ceramic tile floor and base finish using the full bed application method.

1.2 REFERENCES

- A. ANSI A108.5: Installation of Tile with Latex-Portland Cement Mortar.
- B. ANSI A108.6: Installation of Tile with Chemical Resistant Water Cleanable Tile Setting and Grouting Epoxy.
- C. ANSI A108.10: Installation of Grout in Tilework.
- D. ANSI A108.11: Interior Installation of Cementitious Backer Units.
- E. Tile Council of North America (TCNA): Handbook for Ceramic Tile Installation.

1.3 SUBMITTALS

All submittals shall be made under the provisions of Section 01 33 00.

- 1. Submittal No. 09 30 00 A – Product Data: Submit product data indicating material specifications, characteristics, instructions for using adhesives and grouts and maintenance data.
- 2. Submittal No. 09 30 00 B – Samples for Verification: Submit minimum six sets of manufacturer's standard samples for selection of colors and patterns.
- 3. Mock up: Provide for approval, sample panels of each tile pattern in areas designated by the Architect. If acceptable, these may remain part of the final construction.

1.4 PRE-INSTALLATION CONFERENCE

- A. Convene one week prior to commencing work of this Section.

1.5 PROJECT CONDITIONS

- A. Provide sufficient heat and ventilation in areas where ceramic tile work is being performed, so as to allow tile to properly set. Take precautionary measures necessary to ensure excessive temperature changes do not occur.

1.6 WARRANTY

- A. Special Warranty: Provide for correcting failures of waterproofing to resist water penetration, except where failures are result of structural failures of building. Hairline cracking of concrete due to temperature or shrinkage is not considered structural failure.
 - 1. Repair and pay for or replace damaged materials and surfaces.
 - 2. Special Warranty Period: Two years.

PART 2 - PRODUCTS

2.1 FLOOR MATERIALS – Not used.

2.2 WALL MATERIALS

- A. Tile: Ceramic tile in types and styles indicated.
1. Manufacturers:
 - a. Dal-Tile Corp.
 - b. Substitutions: Refer to Section 01 62 00.
 2. Color, Style and Pattern: As indicated on Finish Schedule and conforming to Architect approved samples.
 3. Wall Tile: Smooth surfaced glazed wall tile – ANSI/TCNA A137.1 conforming to the following:
 - a. Moisture Absorption: Less than 20%.
 - b. Size: 4-1/4" x 4-1/4" x 5/16".
 - c. Edge: Cushioned.
 - d. Surface Finish: Matte or Semi-gloss.
 - e. Color: As selected by Architect from price groups 1 through 4. Accent color selected from price groups 1 through 4.
 - f. Base: Coved bottom
 - g. Top row of wainscot: bullnose top.
 - h. Product: Daltile, Semi-gloss/Matte.
- B. Latex Thin Set: Thinset bond coat, consisting of latex-cementitious mortar conforming to ANSI A118.4.
1. Manufacturers:
 - a. Equal to Laticrete International Inc., "15 Premium Mastic".
 - b. Substitutions: Refer to Section 01 62 00.
- C. Wall Grout: Epoxy Grout - ANSI A118.7, epoxy type, uniform in color, resistant to shrinkage.
1. Manufacturers:
 - a. Laticrete International Inc., "SpectraLOCK PRO Grout".
 - b. Substitutions: Refer to Section 01 62 00.
 2. Color: As selected by Architect from manufacturer's standard colors.
- D. Cementitious Backer Units: ANSI A118.9 aggregated Portland cement with woven glass-fiber mesh on both faces; approximately 1/2" thick; UL fire rated as required to maintain integrity of fire rated assemblies.
1. Manufacturers:

- a. USG Industries, Durabond Division/Durock.
 - b. Custom Building Products/Wonderboard.
 - c. James Hardie Building Products/Hardibacker.
 - d. Substitutions: Refer to Section 01 62 00.
- E. Cleaning and Sealing Materials: As recommended by tile and grout manufacturers, such as Bostik Construction Products/Hydroment CeramaSeal.

2.3 MIXES

- A. Mix and proportion cementitious materials for site-made leveling coats, setting beds and grout as recommended by the TCNA Handbook for Ceramic Tile Installation.
- B. Mix and proportion pre-mixed setting beds and grout materials in accordance with manufacturer's recommendations.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Prior to installing tile, ensure surfaces are level.
 - 1. Thin Set Tile Tolerance: Maximum surface variation of 1/8" in 10'-0".
- B. Ensure surfaces are clean and well cured.
- C. Do not commence work until surface conditions are within tolerances required for proper installation; apply latex leveling material where necessary to meet required tolerances.
- D. Waterproof Membrane: Install waterproof membrane at tile areas located above grade, in accordance with manufacturer's recommendations; extend membrane minimum 6" up walls.
 - 1. Comply with waterproof membrane manufacturer recommendations for installation of tile over waterproof membrane.
- E. Cementitious Backer Units: Install units in accordance with ANSI A108.11, manufacturer's recommendations, and as required to provide fire ratings indicated on Drawings.
- F. Floor Sealer: Apply vapor retarding floor sealer on concrete floors indicated to receive epoxy set tile in accordance with manufacturer recommendations and installation instructions.

3.2 INSTALLATION

- A. Install tile in accordance with referenced ANSI Standards and TCA recommendations for type of substrate and indicated setting method.
 - 1. Floor – Not used.
 - 2. Latex-Cement Thin Set Wall Tile over Cementitious Backer Units: TCNA W244.
- B. Place tile in accordance with patterns indicated on Drawings or as directed by Architect; carefully plan tile layouts, ensure pattern is uninterrupted from one surface to the next and through doorways.

**SECTION 09 30 00
TILING**

1. Apply latex thin set to back of tile where necessary to ensure 100% bond between bond coat and substrate; replace tiles which break due to voids between tile and substrate.
- C. Neatly cut tile around fixtures and drains; accurately form corners, base, intersections and returns.
 1. Base, Coves: Flush cove type with base grout joint on wall, cove tile on floor, unless otherwise indicated.
 2. Corners and Edges: Bullnose tile unless otherwise indicated.
- D. Ensure tile joints are uniform in width, subject to normal variance in tolerance allowed in tile size; ensure joints are watertight, without voids, cracks, excess mortar or grout.
- E. Sound tile after setting, remove and replace hollow sounding units.
- F. Allow tile to set for a minimum 48 hours prior to grouting.
- G. Grout tile to comply with recommendations of TCNA and as specified.
- H. Leave completed installation free of broken, damaged and faulty tile.

3.3 CLEANING AND SEALING

- A. Clean tile surfaces free of foreign matter upon completion of grouting.
- B. When recommended by tile manufacturer, apply a protective coat of neutral protective cleaner to completed tile walls and floors. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear.
- C. Prohibit foot and wheel traffic from tiled floors for at least 7-days after grouting is completed.
- D. Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.
- E. Seal tile and grout surfaces where recommended by manufacturer for materials and applications involved; comply with manufacturer's recommendations.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Provide acoustical ceiling tiles in existing suspended grids as noted on drawings. Coordinate with other trades.

1.2 SYSTEM DESCRIPTION

- A. Seismic Design Requirements – Not used.
- B. Fire Performance Characteristics: Provide products listed by Underwriters Laboratories (UL) or other independent testing laboratory acceptable to applicable authorities.
 - 1. Flame Spread/Smoke Density: Provide products meeting code requirements for maximum 25 flame spread and maximum 25 smoke density.
 - 2. Fire Rated Assemblies: Provide systems rated as part of acoustical material and suspension systems for Floor-Ceiling Assemblies.

1.3 REFERENCES

- A. ASTM C635: Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
- B. ASTM C636: Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
- C. ASTM E580: Application of Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels in Areas Requiring Seismic Restraint.

1.4 SUBMITTALS

All submittals shall be submitted under the provisions of Section 01 33 00.

- A. Submittal No. 09 53 13A – Product Data: Furnish manufacturers' literature.
- B. Submittal No. 09 53 13B – Shop Drawings: Clearly indicate grid layout and related dimensioning, junctions with other work and ceiling finishes, and inter-relation of mechanical and electrical items related to system.
- C. Submittal No. 09 53 13C – Samples: Furnish samples of exposed grid finish and each type of ceiling unit.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Firm with minimum three years successful experience in projects of similar type and scope; acceptable to manufacturer of acoustical units.

1.6 SITE CONDITIONS

- A. Do not install ceilings until building is enclosed, sufficient heat is provided, dust-generating activities have terminated and overhead mechanical work is completed, tested and approved.

**SECTION 09 53 13
SUSPENDED ACOUSTIC CEILINGS**

1. Do not allow acoustical ceiling units to be exposed to moisture; immediately remove acoustical ceiling units with stains, units with signs of mold, and units with mildew.
 - B. Allow wet work to dry prior to commencement of installation.
 - C. Maintain uniform temperatures of minimum 60 degrees F and humidity of 20% to 40% prior to, during and after installation.
- 1.7 EXTRA STOCK
- A. Provide 3% cartons of extra tile or minimum 1 full carton whichever is greater, of each type used for the Owners maintenance use at no additional cost.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Suspension System – Existing to remain.
- B. Lay-In Panels: ASTM E1264 type and form as indicated on Drawings.
 1. Manufacturers:
 - a. Armstrong World Industries, Inc.
 - b. USG Interiors, Inc.
 - c. Substitutions: Refer to Section 01 62 00.
 2. Classrooms
 - a. Panels: Mineral composition lay-in ceiling panels with square edge designed to be compatible with specified suspension system.
 - b. Style: Armstrong "Cortega" No. 703 at 2 x 4 ceilings.
 - c. Size: 2'-0" by 4'-0" x $\frac{3}{4}$ ", as indicated on Drawings.
 - d. Finish: Standard washable white painted finish.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Coordinate with other work supported by or penetrating through ceilings, including light fixtures, HVAC equipment and partition systems.

3.2 INSTALLATION

- A. Installation of all suspended acoustical ceilings shall comply with installation requirements outlined in CBC (Title 24 Part 2), Chapter 25A.

SECTION 09 53 13
SUSPENDED ACOUSTIC CEILINGS

- B. Fit acoustic units in place, free from damaged edges or defects detrimental to appearance and function.
 - 1. Lay directionally patterned units one way with pattern as directed.
 - 2. Fit border units neatly against abutting surfaces.

END OF SECTION

PART 1 GENERAL

1.1 WORK INCLUDED

- A. Acoustical tile directly glued to substrate at ceilings.
- B. Perimeter trim.

1.2 REFERENCES

- A. UL - Underwriter's Laboratories System Ratings.

1.3 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacture of ceiling tile with three years minimum experience.
- B. Installer: Company with three years minimum documented experience.

1.4 REGULATORY REQUIREMENTS

- A. Conform to California Building Code Section 803.9 for combustibility requirements for materials.

1.5 SUBMITTALS

- A. Submit shop drawings and product data under provisions of Section 01 33 00.
- B. Submittal No. 09 53 23 A – Product Data.
- C. Submittal No. 09 53 23C - Submit two samples full 12 x 12 inch in size, illustrating material and finish of acoustic units.
- D. Submittal No. 09 53 23D - Submit manufacturer's installation instructions under provisions of Section 01 33 00.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Maintain uniform temperature of minimum 60 degrees F, and humidity of 20 to 40 percent prior to, during, and after installation.

1.7 SEQUENCING/SCHEDULING

- A. Do not install acoustical ceilings until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.
- B. Schedule installation of acoustic units after interior wet work is dry.

1.8 EXTRA STOCK

- A. Provide additional 5% or minimum 1 full carton whichever is greater, of extra tile of each type used for the Owner's maintenance use at no additional cost.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS - ACOUSTIC UNITS

- A. Armstrong #746 - 12" x 12" x 5/8" square edge K4C4 Concealed Fine Fissured.
- B. Substitutions: Under provisions of Section 01 62 00.

2.2 ACOUSTIC UNIT MATERIALS

- A. Glue-on Acoustic Tiles: Conforming to the following:
 - 1. Size: 12 x 12 inches
 - 2. Thickness: 5/8 inches
 - 3. Substrate: Mineral fiber
 - 4. Light Reflectance: .85
 - 5. NRC: .55
 - 6. CAC: 35
 - 7. Fire Hazard Classification: Class A CBC, NFPA 286. Flame spread less than 25 and a smoke density rating of 450.
 - 8. Surface Color: White.

2.3 ACCESSORIES

- A. Edge Trim: Metal "J" molding, white.
- B. Adhesive: Henry #237 Acousti-Gum by W.W. Henry Company 1 (800) 232-4832

PART 3 EXECUTION

3.1 INSPECTION

- A. Verify that existing conditions are ready to receive work.
- B. Beginning of installation means acceptance of existing conditions.

3.2 INSTALLATION

- A. Install system in accordance with manufacturer's instructions and UBC Standard.
- B. Install after major above ceiling work is complete.
- C. Locate tile according to reflected ceiling plan.
- D. Install edge molding at intersection of ceiling and vertical surfaces, using longest practical lengths. Miter corners. Provide edge moldings at junctions with other interruptions.
- E. 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, and free from twist, warp and dents.

3.3 TOLERANCES

- A. Variation from Flat and Level Surface: 1/8 inch in 10 ft.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Provide resilient tile flooring and accessories as required for complete finished installation.
- B. Concrete sealer

1.2 SYSTEM DESCRIPTION

- A. Flammability: Provide materials tested under ASTM E648, Flooring Radiant Panel Test, with results of 0.45 watts/cm² or higher.
- B. Slip Resistance: Provide materials tested under ASTM D2047, James Slip Test with minimum 0.6 rating for floors.

1.3 SUBMITTALS

All submittals shall be submitted under the provisions of Section 01 33 00.

- A. Submittal No. 09 65 00A – Product Data: Furnish manufacturer's product literature.
- B. Submittal No. 09 65 00B – Samples: Furnish samples of each type of flooring color and pattern.

1.4 PROJECT CONDITIONS

- A. Ensure floor surfaces are smooth and flat with maximum variation of 1/8" in 10'-0".
- B. Ensure concrete floors are dry and exhibit negative alkalinity, carbonizing, and dusting.
- C. Maintain minimum 70 degree F air temperature at flooring installation area for three days prior to, during, and for 24 hours after installation.
- D. Store flooring materials in area of application; allow three days for material to reach same temperature as area.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Resilient Tile: 12" by 12" by 1/8" thick; vinyl composition tile conforming to ASTM F1066, Composition 1.
 - 1. Manufacturers:
 - a. Armstrong World Industries, Inc.
 - b. Mannington
 - c. Tarkett Inc.
 - d. Azrock
 - e. Substitutions: Refer to Section 01 62 00.
 - 2. Color and Pattern: As selected by Architect from manufacturer's full range of available colors based on Armstrong/Standard Excelon.

**SECTION 09 65 00
RESILIENT TILE FLOORING (VCT)**

- B. Edge Strips: Homogeneous vinyl or rubber, tapered or bullnose edge, color as selected by Architect.
- C. Sub-Floor Filler: White premixed latex-cement paste designed for providing thin solid surface for leveling and minor ramping of subsurface to adjacent floor finishes.
 - 1. Use material capable of being applied and feathered out to adjacent floor without spalling.
- D. Primers and Adhesives: Waterproof nontoxic types as recommended by flooring manufacturer for specified material and application.

2.2 CONCRETE SEALER

- A. Concrete Sealer:
 - 1. Primer: Mapei "WE" primer.
 - 2. Base Coat: Mapei "Planiseal EMB".
 - 3. Patch: Mapei "Planipatch" with "Planipatch Plus".

2.3 TILE SEALER AND WAX

- A. Type recommended by flooring manufacturer for material type and location.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Conform to manufacturer's recommendations for preparation and to ASTM F710.
- B. Remove sub-floor ridges and bumps; fill low spots, cracks, joints, holes and defects with sub-floor filler.
- C. Clean floor and apply, trowel and float filler to leave smooth, flat hard surface; prohibit traffic until filler is cured.

3.2 INSTALLATION - CONCRETE SEALER

- A. Prime all surfaces with MAPEI "WE" primer per MAPEI recommendations.
- B. Coat all concrete slab surfaces with "Planiseal EMB" sealer. Coverage rates to be per factory recommendations.
- C. Over slab sealer apply first coat of Planipatch/Planipatch Plus skim coat diluted at a 1:1 ratio.
- D. Finish floor slab with final coat of Planipatch/Planipatch Plus diluted at a 1:3 ratio.

3.2 INSTALLATION FLOORING

- A. Conform to manufacturer's recommendations and installation instructions.
 - 1. Open floor tile cartons, enough to cover each area, and mix tile to ensure shade variations do not occur within any one area.

SECTION 09 65 00
RESILIENT TILE FLOORING (VCT)

2. Clean substrate.

- B. Spread cement evenly in quantity recommended by manufacturer to ensure adhesion over entire area of installation; spread only enough adhesive to permit installation of flooring before initial set.
- C. Set flooring in place and press with heavy roller to ensure full adhesion.
- D. Lay flooring with joints parallel to building lines to produce symmetrical pattern.
- E. Install minimum 1/2 tile at room and area perimeter.
- F. Terminate resilient flooring at centerline of door openings where adjacent floor finish is dissimilar.
- G. Install edge strips at unprotected and exposed edges where flooring terminates.
- H. Scribe flooring to walls, columns, floor outlets and other appurtenances, to produce tight joints.
- I. Consult with Architect for floor pattern desired in each area.
- J. Edge Strips: Install where edge of tile would otherwise be exposed; butt to flooring without gaps; set in adhesive.

3.3 CLEAN-UP AND PROTECTION

- A. Remove excess adhesive from floor, base and wall surfaces without causing damage.
- B. Clean, seal and wax floor surfaces in accordance with manufacturer's recommendations.
- C. Prohibit traffic from floor for 48 hours after installation.

END OF SECTION

HYBRI-FLEX EC

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This section includes the following:
 - 1. Resinous flooring system as shown on the drawings and in schedules.
- B. Related sections include the following:
 - 1. Cast-in-Place Concrete, section 03 30 00
 - 2. Concrete Curing, section 03 39 00

1.3 SYSTEM DESCRIPTION

- A. The work shall consist of preparation of the substrate, the furnishing and application of a cementitious urethane based self-leveling seamless flooring system with decorative chip broadcast and Epoxy broadcast and topcoats.
- B. The system shall have the color and texture as specified by the Owner with a nominal thickness of 3/16 inch. It shall be applied to the prepared area(s) as defined in the plans strictly in accordance with the Manufacturer's recommendations.
- C. Cove base (if required) to be applied where noted on plans and per manufacturers standard details unless otherwise noted

1.4 SUBMITTALS

- A. 09 67 23 A - Product Data: Latest edition of Manufacturer's literature including performance data and installation procedures.
- B. 09 67 23 B - Manufacturer's Material Safety Data Sheet (MSDS) for each product being used.
- C. 09 67 23 C - Samples: A 3 x 3 inch square sample of the proposed system. Color, texture, and thickness shall be representative of overall appearance of finished system subject to normal tolerances.

1.5 QUALITY ASSURANCE

- A. The Manufacturer shall have a minimum of 10 years experience in the production, sales, and technical support of epoxy and urethane industrial flooring and related materials.
- B. The Applicator shall have experience in installation of the flooring system as confirmed by the manufacturer in all phases of surface preparation and application of the product specified.
- C. No requests for substitutions shall be considered that would change the generic type of the specified System.
- D. System shall be in compliance with requirements of United States Department of Agriculture (USDA), Food, Drug Administration (FDA), and local Health Department.
- E. System shall be in compliance with the Indoor Air Quality requirements of California section 01350 as verified by a qualified independent testing laboratory.
- F. A pre-installation conference shall be held between Applicator, General Contractor and the Owner to review and clarification of this specification, application procedure, quality control, inspection and acceptance criteria and production schedule.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Packing and Shipping

1. All components of the system shall be delivered to the site in the Manufacturer's packaging, clearly identified with the product type and batch number.

B. Storage and Protection

1. The Applicator shall be provided with a dry storage area for all components. The area shall be between 60 F and 85 F, dry, out of direct sunlight and in accordance with the Manufacturer's recommendations and relevant health and safety regulations.
2. Copies of Material Safety Data Sheets (MSDS) for all components shall be kept on site for review by the Engineer or other personnel.

C. Waste Disposal

1. The Applicator shall be provided with adequate disposal facilities for non-hazardous waste generated during installation of the system.

1.7 PROJECT CONDITIONS

A. Site Requirements

1. Application may proceed while air, material and substrate temperatures are between 60 F and 85 F providing the substrate temperature is above the dew point. Outside of this range, the Manufacturer shall be consulted.
2. The relative humidity in the specific location of the application shall be less than 85 % and the surface temperature shall be at least 5 F above the dew point.
3. The Applicator shall ensure that adequate ventilation is available for the work area. This shall include the use of manufacturer's approved fans, smooth bore tubing and closure of the work area.
4. The Applicator shall be supplied with adequate lighting equal to the final lighting level during the preparation and installation of the system.

B. Conditions of new concrete to be coated with cementitious urethane material.

1. Concrete shall be moisture cured for a minimum of 3 days and have fully cured a minimum of 5 days in accordance with ACI-308 prior to the application of the coating system pending moisture tests.
2. Concrete shall have a flat rubbed finish, float or light steel trowel finish (a hard steel trowel finish is neither necessary nor desirable).
3. Sealers and curing agents should not be used.
4. Concrete shall have minimum design strength of 3,500 psi. and a maximum water/cement ratio of 0.45
5. Concrete surfaces on grade shall have been constructed with a vapor barrier to protect against the effects of vapor transmission and possible delamination of the system.

C. Safety Requirements

1. All open flames and spark-producing equipment shall be removed from the work area prior to commencement of application.
2. "No Smoking" signs shall be posted at the entrances to the work area.
3. The Owner shall be responsible for the removal of foodstuffs from the work area.
4. Non-related personnel in the work area shall be kept to a minimum.

1.8 WARRANTY

- A. Dur-A-Flex, Inc. warrants that material shipped to buyers at the time of shipment substantially free from material defects and will perform substantially to Dur-A-Flex, Inc. published literature if used in accordance with the latest prescribed procedures and prior to the expiration date.
- B. Dur-A-Flex, Inc. liability with respect to this warranty is strictly limited to the value of the material purchase.

PART 2 – PRODUCTS

2.1 FLOORING

- A. Dur-A-Flex, Inc, Hybri-Flex EC (self leveling chip broadcast), epoxy/aliphatic urethane topcoat seamless flooring system.
 - 1. System Materials:
 - a. Topping: Dur-A-Flex, Inc, Poly-Crete MD resin, hardener and SL aggregate.
 - b. The broadcast aggregate shall be Dur-A-Flex, Inc. Macro or Micro chip.
 - c. Broadcast: Dur-A-Flex, Inc. Dur-A-Glaze #4, epoxy based two-component resin.
 - d. Seal coats: Dur-A-Flex, Inc Dur-A-Glaze #4, epoxy-based, two-component resin.
 - e. Top coat: Dur-A-Flex, Inc. Armor Top aliphatic urethane 2 component resin with grit.
 - 2. Patch Materials
 - a. Shallow Fill and Patching: Use Dur-A-Flex, Inc. Poly-Crete MD (up to ¼ inch).
 - b. Deep Fill and Sloping Material (over ¼ inch): Use Dur-A-Flex, Inc. Poly-Crete WR.

2.2 MANUFACTURER

- A. Dur-A-Flex, Inc., 95 Goodwin Street, East Hartford, CT 06108, Phone: (860) 528-9838, Fax: (860) 528-2802
- B. Manufacturer of Approved System shall be single source and made in the USA.

2.3 PRODUCT REQUIREMENTS

<ul style="list-style-type: none"> A. Topping <ul style="list-style-type: none"> 1. Percent Reactive 2. VOC 3. Bond Strength to Concrete ASTM D 4541 4. Compressive Strength, ASTM C 579 5. Tensile Strength, ASTM D 638 6. Flexural Strength, ASTM D 790 7. Impact Resistance @ 125 mils, MIL D-3134, No visible damage or deterioration 	Poly-Crete SL 100 % 0 g/L 400 psi, substrates fails 9,000 psi 2,175 psi 5,076 psi 160 inch lbs
<ul style="list-style-type: none"> B. Broadcast Coat <ul style="list-style-type: none"> 1. Percent Reactive, 2. VOC 3. Water Absorption, ASTM D 570 4. Tensile Strength, ASTM D 638 5. Coefficient of thermal expansion ASTM D 696, 6. Flammability ASTM D-635 7. Flame Spread/ NFPA 101 ASTM E-84 	Dur-A-Glaze #4 Resin 100 % <4 g/L 0.04% 4000psi 2 x 10 ⁻⁵ in/in/F Self-Extinguishing Class A
<ul style="list-style-type: none"> C. Topcoat 	Armor Top

1. VOC	0 g/L
2. 60 Degree Gloss ASTM D523	75+/-5
3. Mixed Viscosity, (Brookfield 25°C)	500 cps
4. Tensile strength, ASTM D 638	7,000 psi
5. Abrasion Resistance, ASTM D4060	Gloss Satin
CS 17 wheel (1,000 g load) 1,000 cycles	4 8 mg loss with grit
	10 12 mg loss without grit
6. Pot life @ 70° F 50% RH	2 hours
7. Dry properties, 70°F, 50% R.H.	8 hours tack free, 12 hours Dry
60°F, 30% RH	12 hours tack free, 18 hours Dry
80°F, 70%RH	4 hours tack free, 6 hours Dry
8. Flash Point PMCC	186°F
9. Full Chemical resistance	7 days

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas and conditions, with Applicator present, for compliance with requirements for maximum moisture content, installation tolerances and other conditions affecting flooring performance.
 - 1. Verify that substrates and conditions are satisfactory for flooring installation and comply with requirements specified.

3.2 PREPARATION

A. General

- 1. New and existing concrete surfaces shall be free of oil, grease, curing compounds, loose particles, moss, algae growth, laitance, friable matter, dirt, and bituminous products.
- 2. Moisture Testing: Perform tests recommended by manufacturer and as follows.
 - a. Perform anhydrous calcium chloride test ASTM F 1869-98. Application will proceed only when the vapor/moisture emission rates from the slab is less than and not higher than 20 lbs/1,000 sf/24 hrs.
 - b. Perform relative humidity test using in situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 99% relative humidity level measurement.
 - c. If the vapor drive exceeds 99% relative humidity or 20 lbs/1,000 sf/24 hrs then the Owner and/or Engineer shall be notified and advised of additional cost for the possible installation of a vapor mitigation system that has been approved by the manufacturer or other means to lower the value to the acceptable limit.
- 3. Mechanical surface preparation
 - a. Shot blast all surfaces to receive flooring system with a mobile steel shot, dust recycling machine (Blastrac or equal). All surface and embedded accumulations of paint, toppings hardened concrete layers, laitance, power trowel finishes and other similar surface characteristics shall be completely removed leaving a bare concrete surface having a minimum profile of CSP 4-5 as described by the International Concrete Repair Institute.
 - b. Floor areas inaccessible to the mobile blast machines shall be mechanically abraded to the same degree of cleanliness, soundness and profile using diamond grinders, needle guns, bush hammers, or other suitable equipment.
 - c. Where the perimeter of the substrate to be coated is not adjacent to a wall or curb, a minimum 1/4 inch key cut shall be made to properly seat the system, providing a smooth transition between areas. The detail cut shall also apply to drain perimeters and expansion joint edges.
 - d. Cracks and joints (non-moving) greater than 1/8 inch wide are to be chiseled or chipped-out and repaired per manufacturer's recommendations.

4. At spalled or worn areas, mechanically remove loose or delaminated concrete to a sound concrete and patch per manufactures recommendations.

3.3 APPLICATION

A. General

1. The system shall be applied in five distinct steps as listed below:
 - a. Substrate preparation
 - b. Topping/overlay application with chip broadcast.
 - c. Resin application with chip broadcast.
 - d. Topcoat application
 - e. Second topcoat application.
2. Immediately prior to the application of any component of the system, the surface shall be dry and any remaining dust or loose particles shall be removed using a vacuum or clean, dry, oil-free compressed air.
3. The handling, mixing and addition of components shall be performed in a safe manner to achieve the desired results in accordance with the Manufacturer's recommendations.
4. The system shall follow the contour of the substrate unless pitching or other leveling work has been specified by the Architect.
5. A neat finish with well-defined boundaries and straight edges shall be provided by the Applicator.

B. Topping

1. The topping shall be applied as a self-leveling system as specified by the Architect. The topping shall be applied in one lift with a nominal thickness of 1/8 inch.
2. The topping shall be comprised of three components, a resin, hardener and filler as supplied by the Manufacturer.
3. The hardener shall be added to the resin and thoroughly dispersed by suitably approved mechanical means. SL Aggregate shall then be added to the catalyzed mixture and mixed in a manner to achieve a homogenous blend.
4. The topping shall be applied over horizontal surfaces using ½ inch "v" notched squeegee, trowels or other systems approved by the Manufacturer.
5. Immediately upon placing, the topping shall be degassed with a loop roller.
6. Chip aggregate shall be broadcast to excess into the wet resin, Macro chip at the rate of 0.1 lbs/sf and Micro chip at the rate of 0.15 lbs/sf.
7. Allow material to fully cure. Vacuum, sweep and/or blow to remove all loose chips.

C. Broadcast

1. The broadcast coat resin shall be applied at the rate of 100 sf/gal.
2. The broadcast coat shall be comprised of liquid components, combined at a ratio of 2 parts resin to 1 part hardener by volume and shall be thoroughly blended by mechanical means such as a high speed paddle mixer.
3. Chip aggregate shall be broadcast into the wet resin, Macro chips at the rate of 0.1 lbs/sf, Micro chips at the rate of 0.15 lbs/sf.
4. Allow material to fully cure. Vacuum, sweep and/or blow to remove all loose chips.

D. Topcoat

1. The first topcoat shall be squeegee applied with a coverage rate of 100 sf/gal.
2. The topcoat shall be comprised of liquid components, combined at a ratio of 2 parts resin to 1 part hardener by volume and shall be thoroughly blended by mechanical means such as a high speed paddle mixer.
3. The first topcoat will be back rolled and cross rolled to provide a uniform texture and finish
2. The second topcoat with grit shall be roller applier with a coverage rate of 500 sf/gal.
3. The finish floor will have a nominal thickness of 3/16 inch.

3.4 FIELD QUALITY CONTROL

A. Tests, Inspection

1. The following tests shall be conducted by the Applicator:
 - a. Temperature
 1. Air, substrate temperatures and, if applicable, dew point.
 - b. Coverage Rates
 1. Rates for all layers shall be monitored by checking quantity of material used against the area covered.

3.5 CLEANING AND PROTECTION

- A. Cure flooring material in compliance with manufacturer's directions, taking care to prevent their contamination during stages of application and prior to completion of the curing process.
- B. Remove masking. Perform detail cleaning at floor termination, to leave cleanable surface for subsequent work of other sections.

END OF SECTION

Concrete sealer needed

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes tufted carpet, adhesive, carpet base and accessories.

1.2 SUBMITTALS

- A. Submittal No. 09 68 00A - Product Data: For each product indicated.
- B. Submittal No. 09 68 00B - Shop Drawings: Show the following:
 - 1. Carpet type, color, and dye lot.
 - 2. Seam locations.
 - 3. Insets and borders.
 - 4. Edge, transition, and other accessory strips.
- C. Submittal No. 09 68 00C - Samples: For each color and texture required.
 - 1. Carpet: 12-inch square Sample.
 - 2. Exposed Edge, Transition, and other Accessory Stripping: 12-inch long Samples.
- D. Maintenance data.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who is approved by the Carpet Manufacturer or who can demonstrate compliance with its certification program requirements.
- B. Mockups: Before installing carpet, build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with Section 01 60 10 "Product Handling."

1.5 WARRANTY

- A. Special Warranty for Carpet: Manufacturer's standard form in which manufacturer agrees to repair or replace components of carpet installation that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, more than 10 percent loss of face fiber, edge raveling, snags, runs, loss of tuft bind strength, and delamination.

1. Warranty Period: 10 years from date of Substantial Completion.

1.6 EXTRA MATERIALS

- A. Furnish extra materials described below, before installation begins, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 1. Carpet: Full-width rolls equal to 5 percent of amount installed for each type indicated, but not less than 10 sq. yd.

PART 2 - PRODUCTS

2.1 TUFTED CARPET

- A. Products: Subject to compliance with requirements, provide the following:

1. C and A Floor Coverings – “Powerbond RS Vinyl Cushion”.
 - a. Color: As selected by Architect from manufacturer's full range.
 - b. Pattern: “Aftermath II” 03026 with “Plexus Colour” 02875 at border.

- B. Fiber: TDX Nylon.
- C. Pile Characteristic: Patterned loop (loop at border).
- D. Stitches per inch: 8.5
- E. Pile Height: .187” for finished carpet per ASTM D 6859.
- F. Gage: 5/64.
- G. Total Weight: 80 oz./sq. yd.
- H. Backing: Powerbond cushion.
- I. Width: Manufacturer’s standard 6’.
- J. Class 1 (mean average CRF: 0.45 w/sq cm or higher) (ASTM E-648)
- K. Smoke generation: Less than 450 (ASTM E-662)

2.2 INSTALLATION ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet manufacturer.
- B. Adhesives: Water-resistant, mildew-resistant, nonstaining type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet and is recommended or provided by carpet manufacturer.

**SECTION 09 68 00
SHEET CARPETING**

- C. Seam Adhesive: Hot-melt adhesive tape or similar product recommended by carpet manufacturer for sealing and taping seams and butting cut edges at backing to form secure seams and to prevent pile loss at seams.
- D. Carpet Base Top Cap: Mercer No. 450, square cap ¼", vinyl molding.
- E. Different Material Joint Cover: Mercer No. 930 Vinyl "T" with 970 track.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Prepare substrate by identifying all depressions and projections. Fill low areas and remove high spots.
- B. Comply with carpet manufacturer's written installation instructions for Direct - Glue-Down Installation.
- C. Comply with carpet manufacturer's written recommendations and Shop Drawings for seam locations and direction of carpet; maintain uniformity of carpet direction and lay of pile. At doorways, center seams under the door in closed position.
- D. Extend carpet into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
- E. Install pattern parallel to walls and borders.
- F. Install carpet base where shown on drawings. Cap carpet base with vinyl trim.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Entrance Carpet Tiles.
- B. Accessories.

1.2 REFERENCES

- A. ANSI/ASTM E648 - Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.
- B. ASTM E84 - Surface Burning Characteristics of Building Materials.
- C. FS DDD-C-0095 - Carpet and Rugs, Wool, Nylon, Acrylic, Modacrylic, Polyester, Polypropylene.

1.3 SUBMITTALS

All submittals shall be made under the provisions of Section 01 33 00.

- A. Submittal No. 09 68 02 A - Provide product data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.
- B. Submittal No. 09 68 02 B – Shop Drawings: Indicate carpet tile pattern
- C. Submittal No. 09 68 02 C - Submit two samples 12 x 24 inch in size illustrating color and pattern for each carpet material specified.

1.4 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in carpet with five years minimum experience.
- B. Installer: Company with five years minimum documented experience approved by manufacturer.

1.5 REGULATORY REQUIREMENTS

- A. Conform to ANSI/ASTM E648.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Store materials for three days prior to installation in area of installation to achieve temperature stability.
- B. Maintain minimum 70 degrees F ambient temperature three days prior to, during, and 24 hours after installation of materials.

1.7 EXTRA MATERIALS

- A. Provide 5% or 10 tiles of carpeting of each color and type specified, whichever is greater.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. The Mohawk Group
- B. Substitutions: Under provisions of Section 01 62 00 - Must be approved prior to bidding.

2.2 MATERIALS

- A. "Heavy Commercial Tile" – "Tuff Stuff II collection as manufactured by Mohawk Commercial (916-487-2975)

Construction	Tufted
Size	24" x 24"
Fiber	Premium Nylon
Gauge	5/32"
Dye Method	Solution Dyed

2.3 ACCESSORIES

- A. Sub-Floor Filler: White premix latex; type recommended by carpet manufacturer.
- B. Primers and Adhesives: NuSprayLok as manufactured by Mohawk Commercial.
- C. Edge Strips: FlexCo. No. 163 with No. 101 track.

2.4 CONCRETE SEALER

- A. Concrete Sealer:
 - 1. Primer: Mapei "WE" primer.
 - 2. Base Coat: Mapei "Planiseal EMB".
 - 3. Patch: Mapei "Planipatch" with "Planipatch Plus".

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that substrate surfaces are smooth and flat with maximum variation of 1/8 inch in 10 ft and are ready to receive work.
- B. Verify concrete floors are dry to a maximum moisture content of 7 percent; and exhibit negative alkalinity, carbonization, or dusting.
- C. Beginning of installation means acceptance of existing substrate and site conditions.

3.2 PREPARATION

- A. Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes, and other defects with sub-floor filler.
- B. Apply, trowel, and float filler to leave smooth, flat, hard surface.

- C. Prohibit traffic until filler is cured.
- D. Vacuum floor surface.

3.3 INSTALLATION - CONCRETE SEALER

- A. Prime all surfaces with MAPEI "WE" primer per MAPEI recommendations.
- B. Coat all concrete slab surfaces with "Planiseal EMB" sealer. Coverage rates to be per factory recommendations.
- C. Over slab sealer apply first coat of Planipatch/Planipatch Plus skim coat diluted at a 1:1 ratio.
- D. Finish floor slab with final coat of Planipatch/Planipatch Plus diluted at a 1:3 ratio.

3.4 INSTALLATION – ENTRY CARPET

- A. Install using quarter turned method.
- B. Apply carpet and adhesive in accordance with manufacturers' instructions. M-1609V
- C. Lay out carpet tiles for approval.
- D. Verify carpet tiles match before cutting to ensure minimal variation between dye lots.
- E. Locate change of color or pattern between rooms under door centerline.
- F. Cut and fit carpet tiles around interruptions.
- G. Fit carpet tight to intersection with vertical surfaces without gaps.

3.5 CLEANING

- A. Remove excess adhesive from floor, base, and wall surfaces without damage.
- B. Clean and vacuum carpet surfaces.

3.6 PROTECTION

- A. Prohibit traffic from carpet areas for 24 hours after installation.

END OF SECTION

PART 1 GENERAL

1.1 WORK INCLUDED

- A. Includes but not limited to:
1. Acoustic fabric wall covering.

1.2 SUBMITTALS

- A. Submittal No. 09 77 13 A - Product Data: Furnish manufacturer's product literature, installation and maintenance instructions.
- B. Submittal No 09 77 13 B – Shop Drawings: Not Required.
- C. Submittal No. 09 77 13 C - Samples: Submit for preliminary selection of colors, textures, patterns, and finishes. Label with name of manufacturer, identification, and the rooms or spaces in which to be used. Prior to installation, submit three 5" x 7" swatches from each approved wallcovering material to be installed.

1.3 REGULATIVE REQUIREMENTS

- A. Meets Class I Flame Spread Rating in accordance with ASTM E-84 Class "A"
1. Flame Spread Rate: 20.
 2. Fuel contributed: 10
 3. Smoke Developed: 10

1.4 PRODUCT DELIVERY

- A. Deliver materials to site in unopened factory packages labeled with manufacturer's name and identification of contents.

PART 2 PRODUCTS

2.1 WALL FABRIC

- A. Acoustic Fabric Wall Covering: Hush, as manufactured by JM Lynne.
1. 100% non-woven polyester.
 2. 24 Oz./linear yard.
 3. 54" width.
 4. Acrylic backing.
 5. Acoustical rating: ANSI-ASTM C423 N.R.C. .70
 6. Light fastness (AATCC 16A): Exceeding 100 hours.
 7. Thermal resistance rating (ASTM C-177): 0.595.
 8. Must comply with CBC Standard 42-2 Phoenix corner burn test.
- B. Substitutions: Provisions of Section 01 62 00.

2.2 ADHESIVES

- A. Use only fungus resistant adhesives, GC-460A or GC-120.
- B. General Surfaces:
1. FC-100 by Columbus Coated Fabrics, Columbus, OH.
 2. Manufacturer's recommended equal.

- B. Edges of Wall Covering:
 - 1. FC-300 by Columbus Coated Fabrics, Columbus, OH.
 - 2. Manufacturer's recommended equal.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Dry trim edges between the ribs with a row cutter or straight edge and razor blade to balance seam between ribs. Do not cut across ribs. Change blades after every cut.
- B. Apply adhesive to panels with 3/8" nap past roller. Install from top to bottom, between two plumb lines for absolute vertical alignment with a minimal trim, 1" left at top and bottom.
- C. Press fabric firmly to panels using 1/4" nap roller to ensure maximum contact with adhesive.
- D. Trim excess using a broad knife to hold the fabric in place so that no movement occurs.
- E. Butt seam subsequent panels.
- F. Hang pieces in numerical sequence.
- G. Do not reverse-hang panels.
- H. Care should be taken not to overwork (brush) or crush the seam areas.
- I. Hang three strips and thoroughly inspect before proceeding.

3.2 CLEANING

- A. Thoroughly clean the surfaces and remove all visible adhesive.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Provide and install fabric covered tackboard wall panels in rooms and patterns as illustrated in the construction documents.

1.2 REFERENCES

- A. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- B. ASTM C 423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.

1.3 SUBMITTALS

All submittals shall be made under the provisions of Section 01 33 00.

A. Submittal No. 09 84 00A - Product Data:

1. Submit manufacturer's literature, including preparation instructions and recommendations and installation methods.
2. Quality Assurance: Test results from independent testing laboratory substantiating specified sound reduction frequencies.

B. Submittal No. 09 84 00B – Shop Drawings: Not Required

C. Submittal No. 09 84 00C – Samples:

1. Selection Samples: For each panel finish specified, two complete sets of color swatches representing manufacturer's full range of available colors, patterns, and materials.
2. Verification Samples: For each finish product specified, two sample panels, minimum size 6 inches (150 mm) square, representing actual product, color, and pattern.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.5 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.6 WARRANTY

- A. Manufacturer's standard 1 year warranty on materials, provided that product is installed in accordance with manufacturer's standards.

PART 2 - PRODUCTS

2.1 FABRIC COVERED TACKBOARD

- A. Acceptable Manufacturers:
 - 1. Tackboards: Chatfield-Clarke (Product # 14614), Fontana, California.
 - 2. Fabric: The complete Koroseal School Collection.
 - 3. Substitutions: Refer to Section 01 62 00.
- B. Colors: As selected by Architect from manufacturer's full range of available colors.
- C. NRC Rating: 1.00, when tested in accordance with ASTM C 423, using test mounting A.
- D. Fire Rating: Class A Flame Spread =15, Smoke Development = 20, when tested in accordance with ASTM E 84 tunnel test.
- E. Edges: Chamfered, typical.
- F. Dimensions: 48" wide by height indicated on interior elevations.
- G. Mounting: As recommended by manufacturer.
- H. Fabric-covered trim pieces, including J-shaped edges and H-shaped joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

SECTION 09 84 00
VINYL COVERED TACKBOARD

3.3 INSTALLATION

- A. Layout: Install with long dimension vertical. Lay out accurately between corners, jambs, walls, or their stopping points or changes in direction to equalize spacing of joints. Do not make any joints at external corners.
- B. There are to be no horizontal joints.
- C. Lay out panels along wall so as to minimize the number of vertical joints. See drawing interior elevations.
- D. Application: Apply per manufacturer's specifications and printed instructions. Nails may be used where unexposed. Wrap all exposed edges with vinyl covering where panel is cut down from original size. In lieu of wrapping edges, aluminum channel trim may be used at door and window frames, change in materials, corners and cut edges. On completion, remove any adhesive and marks from material.

3.4 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

PART 1- GENERAL

1.1 WORK INCLUDED

- A. Includes but not limited to:
 - 1. Preparation of existing and new surfaces.
 - 2. Painting existing and new surfaces.
 - 3. Gypsum Board preparation coat.
 - 4. Layout and masking of multiple colored surfaces.

1.2 REFERENCES

- A. ANSI/ASTM D16 - Definitions of Terms Relating to Paint, Varnish, Lacquer, and Related Products.
- B. ASTM D2016 - Test Method for Moisture Content of Wood.

1.3 DEFINITIONS

- A. Conform to ANSI/ASTM D16 for interpretation of terms used in this Section.

1.4 QUALITY ASSURANCE

- A. Product Manufacturer: Company specializing in manufacturing quality paint and finish products with three years experience.
- B. Applicator: Company specializing in commercial painting and finishing with years documented experience approved by product manufacturer.
- C. Products shall meet or exceed the following Federal Specifications:
 - 1. Alkyd Enamel - TT-E-489 QPL
 - 2. Zinc Oxide Primer - TT-P-641
- D. Contractor is to verify that paint on site matches approved color samples.
- E. Provide manufacturers 5 year written performance guarantee for elastomeric paint and application error (materials and labor).

1.5 REGULATORY REQUIREMENTS

- A. Conform to code for flame/fuel/smoke rating requirements for finishes.
- B. Conform to latest requirements of the Environmental Protection Agency.
- C. Lead In Existing Paint
 - 1. The painting subcontractor shall have working knowledge of Title 8, California Code of Regulations, Section 1532.1 – Construction Lead Standards.
 - 2. Preparation work which disturbs existing lead bearing materials shall fall under Cal-OSHA defined level 1, 2, 3 or 4 trigger tasks. Contractor shall have complete knowledge of OSHA requirements and proceed with the preparation work accordingly. Contractor's lack of knowledge or experience in meeting OSHA lead requirements will not be grounds for not preparing existing surfaces as required here-in.
 - 3. Due to the age of the structures involved in this project the contractor shall assume that existing paint materials contain lead.

**SECTION 09 90 10
MODERNIZATION PAINTING**

1.6 SUBMITTALS

- A. Submittal No. 09 90 10 A - Product data: Submit under provisions of Section 01 33 00.
- B. Provide product data on all finishing products.
- C. Submittal No. 09 90 10 B – Samples: Submit under provisions of Section 01 33 00.
- D. Submit two samples 8-1/2 x 11 inch in size illustrating range of colors and textures for each surface finishing product scheduled.
- E. Submittal No. 09 90 10 C - Manufacturer's application instructions: Submit under provisions of Section 01 33 00.
- F. Submittal No. 09 90 10 D - Color charts: Submit in duplicate for all paints, stains and special coatings under provisions of Section 01 33 00.
- G. Note any potential paint compatibility or bonding issues and suggested solution.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store and protect products under provisions of Section 01 60 00.
- B. Deliver products to site in sealed and labeled containers; inspect to verify acceptance.
- C. Container labeling to include manufacturer's name, type of paint, brand name, brand code, coverage, surface preparation, drying time, cleanup, color designation, and instructions for mixing and reducing.
- D. Store paint materials at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in well ventilated area, unless required otherwise by manufacturer's instructions.
- E. Take precautionary measures to prevent fire hazards and spontaneous combustion.

1.8 ENVIRONMENTAL REQUIREMENTS

- A. Provide continuous ventilation and heating facilities to maintain surface and ambient temperatures above 45 degrees F for 24 hours before, during, and 48 hours after application of finishes, unless required otherwise by manufacturer's instructions.
- B. Do not apply exterior coatings during rain or snow, or when relative humidity is above 50 percent, unless required otherwise by manufacturer's instructions.
- C. Minimum Application Temperatures for Latex Paints: 45 degrees F interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.
- D. Minimum Application Temperature for lacquer and clear Finishes: 65 degrees F for interior or exterior, unless required otherwise by manufacturer's instructions.
- E. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

1.9 EXTRA STOCK

- A. Provide a one-gallon container of each color and surface texture to Owner.

- B. Label each container with color, texture, and room locations, in addition to the manufacturer's label.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS - PAINT

- A. Kelley Moore, San Carlos, CA
- B. Dunn Edwards, Los Angeles, CA.
- C. Sonneborn, Hayward, CA
- D. Or equal
- E. Substitutions: Under provisions of Section 01 62 00.

2.2 MATERIALS

- A. Coatings: Ready mixed. Process pigments to a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating.
- B. Coatings: Good flow and brushing properties; capable of drying or curing free of streaks or sags.
- C. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve the finishes specified, of commercial quality.
- D. Provide primers and other undercoat paint produced by same manufacturer as finish coats. Use only thinners approved by paint manufacturer, and use only within recommended limits.

2.3 FINISHES

- A. Refer to schedule for surface finish and color.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Verify that surfaces and substrate conditions are ready to receive work as instructed by the product manufacturer.
- B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application, adhesion of new finish or degradation of new finish.
- C. Beginning of installation means acceptance of existing surfaces.

3.2 PREPARATION – NEW SURFACES

- A. Remove electrical plates, hardware, light fixture trim, and fittings prior to preparing surfaces or finishing. Mask manufacturer's data plates, fire rating labels, or other informative labels.
- B. Correct minor defects and clean surfaces which affect work of this Section.

**SECTION 09 90 10
MODERNIZATION PAINTING**

- C. Impervious Surfaces: Remove mildew by scrubbing with solution of tri-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- D. Gypsum Board Surfaces: Latex fill minor defects. Spot prime defects after repair.
- E. Shop Primed Steel 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. Prime metal items including shop primed items.
- F. Interior Wood Items Scheduled to Receive Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after sealer has dried; sand between coats.
- G. Metal Doors Scheduled for Finishing: Seal top and bottom edges with primer.
- H. Wood: Sandpaper to smooth and even surface and then dust off. After primer coat has been applied, thoroughly fill nail and other holes and cracks with plastic wood or putty. For natural finished work, putty shall be colored to match the wood.
- I. Apply wood filler in countersunk exposed fasteners indentations. Sand work smooth.

3.3 PREPARATION – EXISTING SURFACES

- 1. Meet requirements of Section 3.2 and as follows:
 - All existing painted surfaces shall be cleaned so as to be free of dirt, dust, rust, stains, grease, oil, mildew, wax, efflorescence or other contaminants.
 - Remove all loose, peeling or chalky paint by scraping, sanding or high pressure washing. Feather uneven edges at areas of removed loose material with patch material and sand.
 - Fill all cracks, holes or other surface imperfections with patch material and sand smooth.
 - Prime all existing painted surfaces with specified primer.

3.4 PROTECTION

- A. Protect elements surrounding the work of this Section from damage or disfiguration.
- B. Repair damage to other surfaces caused by work of this Section.
- C. Furnish drop cloths, shields, and protective methods to prevent spray or droppings from disfiguring other surfaces.
- D. Remove empty paint containers from site.

3.5 APPLICATION

- A. Apply products in accordance with manufacturer's instructions.
- B. Do not apply finishes to surfaces that are not dry.
- C. Apply each coat to uniform finish.
- D. Apply each coat of paint slightly darker than preceding coat unless otherwise approved.
- E. Sand lightly between coats to achieve required finish.

- F. Allow applied coat to dry before next coat is applied.
 - G. Where clear finishes are required, tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.
 - H. Prime back surfaces of interior and exterior woodwork with primer paint.
 - I. Prime back surfaces of interior woodwork scheduled to receive stain or varnish finish with gloss varnish reduced 25 percent with mineral spirits.
 - J. Verify that sealants to be painted are applied prior to painting or adjacent surfaces.
 - K. When applying paint with airless spray equipment, backroll applied paint immediately after application.
- 3.6 CLEANING
- A. As Work proceeds, promptly remove paint where spilled, splashed, or spattered.
 - B. During progress of Work maintain premises free of unnecessary accumulation of tools, equipment, surplus materials, and debris.
- 3.7 SCHEDULE - EXTERIOR SURFACES PAINTING MATERIALS
- A. Steel - Shop Primed Doors, Door Frames, Fabricated Metal Items, Pipe Railings, Etc...
 - 1. One coat rust inhibitive DTM primer (white primer)
 - 2. Two coats of 100% acrylic DTM Industrial Enamel.
 - B. Wood
 - 1. One coat latex primer, semi gloss.
 - 2. Two coats acrylic latex (solids by volume: minimum 30%)
 - C. Wood Trim
 - 1. One coat latex primer.
 - 2. Two coats of acrylic latex semi gloss (solids by volume: minimum 30%).
 - D. Existing concrete walls, previously painted.
 - 1. One coat "ZINSSER Peel Stop". Clear binding sealer at all areas where peeling paint has been removed.
 - 2. One coat block filler as a prime coat.
 - 3. Two coats "Kelly Moore 1245 Acryshield" exterior low sheen paint.
 - E. Existing cement plaster walls, previously painted.
 - 1. One coat latex primer.
 - 2. Two coats "Kelley Moore 1245 Acryshield" exterior low sheen paint.
 - F. Existing steel door frames, previously painted.
 - 1. Loose and peeling paint are to be removed from perimeter steel window frames by owner's abatement contractor.
 - 2. One coat "ZINSSER Peel Stop". Clear binding sealer at all areas where peeling paint has been removed.
 - 3. Second coat "ZINSSER Peel Stop". Clear binding sealer at all areas where peeling paint has been removed.
 - 4. One coat block filler as a prime coat.
 - 5. Two coats "Kelly Moore 1245 Acryshield" exterior low sheen paint.

3.8 SCHEDULE - INTERIOR SURFACES PAINTING MATERIALS

- A. Steel - Shop Primed (Doors, Door Frames, Handrails, Fabricated Metals, Etc...)
 - 1. One coat rust inhibitive DTM primer (white primer)
 - 2. Two coats of 100% acrylic DTM Industrial Enamel.

- B. Gypsum Board - New
 - 1. One coat "Hamilton - Prep coat" prior to application of gyp. bd. texture (masking by others).
 - 2. One coat PVA primer
 - 3. Two coats acrylic latex, semigloss. (solids by volume: minimum 30%)

- C. Previously Painted Walls and Ceilings
 - 1. One coat high bond acrylic primer – equal to Kelly Moore 295 Uni-Prime
 - 2. Two coats acrylic latex semi-gloss

- D. Previously Painted Doors, Frames and Trim
 - 1. One coat high bond acrylic primer
 - 2. Two coats acrylic latex semi-gloss

- E. New 12" x 12" glue on acoustic ceiling tiles
 - 1. One coat block filler
 - 2. Two coats acrylic latex eggshell

- F. Stained Wood - New oak hook mounting boards.
 - 1. 1st coat: Wood Stain
 - 2. 2nd coat: Sanding Sealer
 - 3. 3rd and 4th coat: Acrylic modified urethane.

3.9 SCHEDULE - SURFACES TO BE PAINTED, EXTERIOR

- A. New exterior steel doors and frames.
- B. Wood fascia, barge and misc. exterior trim.
- C. Existing exterior steel doors and frames.
- D. Existing wood exterior doors and frames.
- E. Existing cement plaster walls and soffits.
- F. Exterior pipe rails and downspouts, new and existing.

3.10 SCHEDULE - SURFACES TO BE PAINTED, INTERIOR

- A. Metal doors and frames.
- B. Gypsum board walls and ceilings, new and existing.
- C. Glue on acoustic tiles, new and existing.
- D. Exposed Metal access panels.
- G. Repaint all existing surfaces that have been previously painted within scope of work.

**SECTION 09 90 10
MODERNIZATION PAINTING**

- H. Wood Doors, frames and trim.
- I. Wood hook mounting boards.

3.11 COLOR SELECTION

- A. Specific colors shall be selected by Architect after award of contract.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Provide general signage as indicated complete with attachment devices and accessories as required for complete installation.

1.2 SUBMITTALS

All submittals shall be submitted under the provisions of Section 01 33 00.

- A. Submittal No. 10 14 00A - Product Data: Furnish manufacturer's literature and indicate each sign type, style, color, and method of attachment.
- B. Submittal No. 10 14 00B - Shop Drawings: Furnish listing of sign types, lettering and locations, along with overall dimension of each sign.
 - 1. Computerized Output: Furnish computerized samples of applied copy signs and graphics at full scale duplicating final appearance.
- C. Submittal No. 10 14 00C - Samples: Furnish full size samples where requested.

1.3 QUALITY ASSURANCE

- A. Access for Persons with Disabilities: Provide signs for assuring access for persons with disabilities in accordance with state and federal regulations.
 - 1. California Regulations: Comply with California Building Code.
 - 2. Federal Regulations: Comply with 2010 Americans with Disabilities Act Accessibility Standards (ADA-ABA).

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Package separately or in like groups of names, labeled as to names enclosed; include installation template, attachment system and installation instructions.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. ASI Sign Systems Inc.
- B. Mohawk Engraving Company, Incorporated.
- C. Best Sign Systems Inc.
- D. Cameo, California Metal Enameling Co.
- E. Vomar Products, Inc.
- F. Impact Architectural Signs, Inc. (Exterior Building Identification).
Manzanita Elementary School Modernization
Redding School District
NMR Project No. 18-2877

G. Substitutions: Refer to Section 01 62 00.

2.2 MATERIALS

A. CBC Toilet Room Signs: Provide colored plastic signs, conforming to 2016 CBC requirements for signs for toilet rooms, with inset symbols and characters; concealed mounting system.

1. Total Thickness: 0.25".
2. Provide signs required by California Code of Regulations Title 24.
 - a. Men's Room: 12" equilateral triangle, vertex pointing up.
 - b. Ladies' Room: 12" diameter circle.
 - c. Unisex Toilet: 12" diameter circle with equilateral triangle, vertex pointing up, inscribed in circle; circle and triangle each 0.25" thick.
3. Colors: As selected to contrast with doors.
4. Symbols: As selected from manufacturer's standard symbols.
5. Adhesive: Type as recommended by sign manufacturer for type of substrate involved.

B. ADAAG Toilet Room Signs: Provide colored plastic signs, conforming with ADAAG requirements for signs for permanent rooms, with inset symbols and with raised and Braille characters; concealed mounting system.

1. Comply with ADAAG requirements for raised and Braille characters, pictorial symbols, finish, and contrasts requirements.
2. Colors: As selected by Architect.

C. Entry Decals: Provide minimum 6" square decals with international symbol of accessibility white on blue background with white border, applied to glass at accessible entry doors.

D. Braille Exit Door Signs: Provide colored plastic signs, conforming to 2016 CBC requirements for signs for permanent rooms, with raised and Braille characters; concealed mounting system.

1. Colors: As selected by Architect.
2. Size and Style: As indicated on Drawings.

E. General Sign Requirements:

1. Character Type: Characters on signs shall be raised 1/32 inch minimum and shall be sans serif uppercase characters accompanied by California Grade 2 Braille. See Note 5 below.
2. Character Size: Raised characters shall be a minimum of 5/8 inch and a maximum of 2 inches high.
3. Finish and Contrast: Characters, Symbols and their background shall contrast and have a non-glare finish, CBC Chapter 11B-703.5.1.

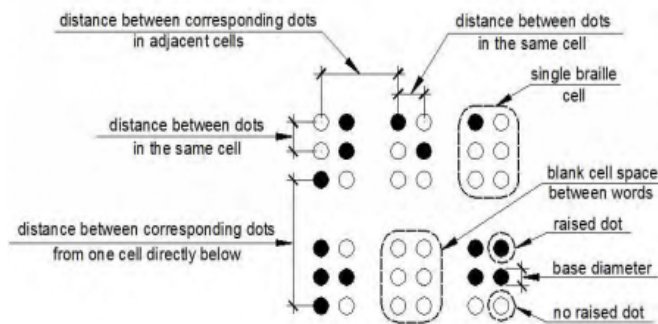
**SECTION 10 14 00
SIGNAGE**

4. Proportions: The uppercase letter "O" of characters shall be between 60% and 110% of the height of uppercase letter "I" and the stroke thickness of uppercase letter "I" shall be 15% max. of the height of the character, 11B-703.2.4, 11B-703.2.6.
5. Braille: California Grade 2 Braille shall be used wherever Braille is required in other portions of these standards. Braille dots shall have a domed or rounded shape and shall comply with Table 11B-703.3.1, and shall be positioned below the corresponding text per 11B-703.3.2.

**TABLE 11B-703.3.1
BRAILLE DIMENSIONS**

MEASUREMENT RANGE	MINIMUM IN INCHES MAXIMUM IN INCHES
Dot base diameter	0.059 (1.5 mm) to 0.063 (1.6 mm)
Distance between two dots in the same cell ¹	0.100 (2.5 mm)
Distance between corresponding dots in adjacent cells ¹	0.300 (7.6 mm)
Dot height	0.025 (0.6 mm) to 0.037 (0.9 mm)
Distance between corresponding dots from one cell directly below ¹	0.395 (10 mm) to 0.400 (10.2 mm)

1. Measured center to center.



**FIGURE 11B-703.3.1
BRAILLE MEASUREMENT**

2.3 EXTERIOR BUILDING IDENTIFICATION SIGNS

- A. Individual cast aluminum letters, brushed finish, by Impact Architectural Signs, 26 E Burlington Avenue, Lagrange, IL 60525. Toll Free (800) 492-1201. Web: impactsigns.com. Sizes as indicated on drawings.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install signs in accordance with manufacturer recommendations and installation instructions, free from distortions and defects.
- B. California Toilet Room Signs: Install signs on doors after doors are painted and finished.
 1. Location: Mount signs centered at 60" above finished floor.
 2. Install centered and level, in line, in accordance with the manufacturer's recommendations.
 3. Clean and polish, remove excess adhesive.

**SECTION 10 14 00
SIGNAGE**

- C. CBC Toilet Room Signs: Install signs on walls after surfaces on which they are to be mounted are painted and finished.
 - 1. Location: Mount signs with base of Braille minimum 48" above finished floor and base of highest text maximum 60" above finish floor per CBC Section 11B-703.4.1.
 - 2. Install level, in line, in accordance with the manufacturer's recommendations and ADAAG requirements to allow a person to approach within 3" of signs without being within a door swing.
 - 3. Clean and polish, remove excess adhesive.
- D. Entry Signs: Install in locations as approved by Architect.
- E. Stair Signs: Install signs inside stairwell after walls are finished, at locations immediately adjacent to door on strike side as required by referenced code, readily visible when door is open.
 - 1. Height: Mount signs with base of Braille minimum 48" above finished floor and base of highest text maximum 60" above finish floor per CBC Section 11B-703.4.1.
- F. Tactile and Braille Exit Door Signs: Install at doors with lighted "EXIT" signs; apply after walls are finished.
 - 1. Location: Mount signs 48" minimum above finished floor measured from baseline of lowest Braille cells and 60" maximum above finished floor measured from baseline of the highest line of raised characters on strike side of door
 - 2. Install level, in line, in accordance with the manufacturer's recommendations and CBC requirements to allow a person to approach within 3" of signs without being within a door swing.
 - 3. Clean and polish, remove excess adhesive.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes:

1. Toilet Enclosures: Floor anchored and overhead braced.
2. Provide attachment hardware and integral accessories as required for complete installation.

1.2 REFERENCES

- A. Americans with Disabilities Act, Accessibility Guidelines (ADAAG).
- B. California Building Code: California Code of Regulations, Title 24, Part 2, requirements for providing accessibility for persons with disabilities.

1.3 SUBMITTALS

All submittals shall be made under the provisions of Section 01 33 00.

- A. Submittal No. 10 21 13A – Product Data: Submit manufacturer's literature.
- B. Submittal No. 10 21 13B – Shop Drawings: Clearly indicate partition layouts, swing of doors, elevations, anchorage and mounting details, panel construction, hardware, finishes and relevant dimensions.
- C. Submittal No. 10 21 13C - Samples: Submit samples of metal finish.

1.4 QUALITY ASSURANCE

- A. Access for Persons with Disabilities: Comply with California Building Code and Americans with Disabilities Act Accessibility Guidelines (ADAAG).
 1. Door Width: Provide minimum 32" clear door openings when front entry, minimum 34" clear door openings when side entry.
 2. Spacing: Provide minimum 32" clearance between water closet and inside edge of partition on side away from grab bars, minimum 60" clear width, and front space as applicable.
 3. Reinforcing: Provide reinforcing for grab bars indicated to be partition mounted.
 4. Urinal Screens: Provide minimum 30" clear space at urinal.

1.5 WARRANTY

- A. Minimum 15 year material warranty.
- B. Furnish written warranty signed by installer for one year period from date of substantial completion.

PART 2 – PRODUCTS

2.1 SOLID-POLYMER UNITS

A. Manufacturers:

1. Santana/Comtec by Scranton Products, 801 E. Corey Street, Scranton, PA 18505.
www.scrantonproducts.com
2. Accurate Partitions Corp., 8000 Joliet Rd, McCook, IL 60525.
www.accuracy.com
3. Substitutions: Refer to Section 01 62 00.

B. Door, Panel, and Pilaster Construction: Solid, high-density polyethylene (HDPE), not less than 1 inch thick, seamless, with eased edges, and with homogenous color and pattern throughout thickness of material. Chrome plated strike/keeper, coat hook, latch, bumper and integral pivot type hinges.

1. Provide accessible pulls on both sides of accessible compartment doors.
2. Doors to accessible compartments to be self closing.
3. All hardware at accessible compartments is to comply with 2016 CBC.

C. Texture, Color and Pattern: One texture, color and pattern in each room as selected by Architect from manufacturer's full range of textures, colors and patterns.

D. Pilaster Shoes and Sleeves: Manufacturer's standard design.

1. Polymer Color and Pattern: Match pilaster, as selected by Architect from manufacturer's full range of colors and patterns.

E. Space Below Partitions – 12” Minimum toe clearance – 11B-604.8.1.4.

F. Brackets (Fittings): Full-Height (Continuous) Type, manufacturer's standard plastic design.

G. Overhead Cross Bracing for Ceiling-Hung Units: As recommended by manufacturer and fabricated from aluminum.

H. Urinal Screens: Wall mounted with floor supported pilasters. 24” maximum depth from wall. 30” minimum clearance between pilaster fins.

J. Flame Spread Index - 76-200, Smoke Developed Index - Less than 450.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Examine site conditions to which work is to be applied.
- B. Take site dimensions affecting this work.

**SECTION 10 21 13
TOILET COMPARTMENTS**

- C. Ensure correct spacing and size of plumbing fixtures; take special note of fixtures in compartments indicated to be designed for persons with disabilities to assure clearances complying with access regulations.
- D. Ensure correct location of built-in framing, anchorage, and bracing, where required.

3.2 INSTALLATION

- A. Install units in accordance with manufacturer recommendations and installation instructions, secure, plumb, level, and square.
- B. Leave 1/2" space between wall, panels and end pilasters.
- C. Attach panel brackets securely to walls using anchor devices.
- D. Attach panels and pilasters to bracket with through sleeve tamper proof bolts and nuts.
- E. Locate headrail joints at pilaster centerlines.
- F. Provide for adjustment of floor variations with screw jack through steel saddles integral with pilaster; conceal floor fastenings with stainless steel shoes.
- G. Equip each door with hinges, latch, and coat hook/bumper combination.
- H. Install door strike keeper and door bumper on each pilaster in alignment with door latch.
- I. Adjust and align hardware to uniform clearance at vertical edges of doors not exceeding 3/16".
- J. Adjust hinges to locate doors in partial open position when unlatched, except adjust hinges to return doors to closed position at stalls designed for use by persons with disabilities.
- K. Anchor urinal screen panels to walls with two panel brackets.

3.3 CLEANING

- A. Field touch-up of scratches and defaced finishes will not be permitted; replace damaged, scratched and marred defective materials with new, undamaged materials.
- B. Remove protective maskings; clean surfaces free of oil and imperfections.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Stainless steel corner guards.
2. Mounting adhesive and accessories as required for complete finished installation.

1.2 SUBMITTALS

All submittals shall be made under the provisions of Section 01 33 00.

- A. Submittal No. 10 26 13A – Product Data: Furnish manufacturer's product literature.
- B. Submittal No. 10 26 13B – Samples: Furnish samples of corner guards.

1.3 PROJECT CONDITIONS

- A. Maintain minimum 70 degree F air temperature at installation area for three days before, during, and for 24 hours after installation.

PART 2 - PRODUCTS

2.1 STAINLESS STEEL CORNER GUARDS

A. Manufacturers:

1. Bobrick Washroom Equipment, Inc./B-633 Corner Guard.
2. Bradley Corporation/Model 991 Corner Guard.
3. Substitutions: Refer to Section 01 62 00.

B. Materials:

1. Corner Guard: ASTM A666, Type 304 stainless steel with satin finish; minimum 18 gage.
2. Size: 2" by 2" by height of wall.
3. Attachment: Manufacturer's recommended adhesive for type of wall.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install guards in accordance with manufacturer's recommendations and installation instructions.
- B. Install straight and level to variation of plus or minus 1/8" over 10 feet; variation shall not be cumulative.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Provide toilet accessories with attachment hardware and rough-in frames as required for complete, operational installation.
2. Provide accessories in toilet rooms, classrooms and other rooms as noted on the drawings and per schedule at the end of this Section.

1.2 SUBMITTALS

All submittals shall be submitted under the provisions of Section 01 33 00.

- A. Submittal No. 10 28 13 A – Product Data: Provide product data on accessories describing size, finish, details of function, attachment methods and blocking requirements and locations prior to wall framing. Submit manufacturer’s installation instructions for all specified products.
- B. Submittal No. 10 28 13 B – Shop Drawings: Not Required
- C. Submittal No. 10 28 13 C – Samples: Not Required

1.3 QUALITY ASSURANCE

- A. Access for Persons with Disabilities: Comply with California Building Code and Americans with Disabilities Act Accessibility Guidelines (ADAAG).

1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver inserts and rough-in frames to jobsite at appropriate time for building in.
- B. Do not deliver accessories to site until rooms in which they are to be installed are ready to receive them.
- C. Pack accessories individually, protect each item and its finish.

1.5 PROJECT CONDITIONS

- A. Protect adjacent or adjoining finished surfaces from damage during installation of work of this section.
- B. Before starting work notify Architect in writing of conditions detrimental to installation or operation of units.
- C. Verify with Architect exact location of accessories.
- D. Coordinate the work of this Section with the placement of internal wall reinforcement and reinforcement to receive anchor attachments.

1.6 WARRANTY

- A. Special Warranty: Replace mirrors that exhibit signs of desilvering or distortion.
 - 1. Special Warranty Period: Two years.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Bobrick Washroom Equipment, Inc.
- B. Bradley Corporation.
- C. American Specialties, Inc.
- D. NuTone
- E. Substitutions: Refer to Section 01 62 00.

2.2 MATERIALS

- A. Stainless Steel Sheet: ASTM A666, commercial grade, Type 302/304, gages as standard with manufacturer of specified items.
- B. Stainless Steel Tubing: ASTM A269, commercial grade, seamless welded.
- C. Sheet Steel: ASTM A1008, cold rolled stretcher leveled; minimum G90 galvanized coating, ASTM A924 and A653.
- D. Adhesive: Epoxy type contact cement as recommended by accessory manufacturer.
- E. Fasteners, Screws, and Bolts: Hot dip galvanized; as recommended by accessory manufacturer for component and substrate.
- F. Keys: Provide universal keys for access to toilet accessory units requiring internal access for servicing and supply.
 - 1. Provide minimum six keys to Owner representative.
- G. Mirror Glass: ASTM C1036, q1 mirror select clear float glass with full silver coating, copper coating and organic coating; minimum 1/4" thick.

2.3 FABRICATION

- A. Weld and grind smooth joints of fabricated components.
- B. Form exposed surfaces from one sheet of stock, free of joints.
- C. Fabricate units with tight seams and joints, exposed edges rolled; hang doors and access panels with continuous piano hinges; provide concealed anchorage where possible.
- D. Provide steel anchor plates and anchor components for installation on building finishes.

**SECTION 10 28 13
TOILET ACCESSORIES**

- E. Form surfaces flat without distortion; maintain flat surfaces without scratches and without dents; finish exposed edges eased, free of sharp edges where potential exists for physical contact.
- F. Back paint components where contact is made with building finishes, to prevent electrolysis.
- G. Hot dip galvanize ferrous metal anchors and fastening devices.
- H. Assemble components in shop; package complete with anchors and fittings.

2.4 FINISHES

- A. Exposed Finishes: Stainless steel, number 4, satin finish; satin chrome finish acceptable where stainless steel not available for accessory item listed or scheduled.
- B. Concealed Surfaces: Treat and clean, spray-apply one coat primer and baked enamel finish.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Provide templates and rough-in measurements.

3.2 INSTALLATION

- A. Install accessories in accordance with manufacturer's printed instructions using fasteners appropriate to substrate.
- B. Install true, plumb and level, securely and rigidly anchored to substrate.
- C. Use tamper-proof, security type fasteners.
- D. Adjust accessories for proper operation and verify mechanisms function smoothly.
- E. Replace damaged and defective items.
- F. Clean and polish exposed surfaces after removing temporary labels.

3.3 ACCESSORIES SCHEDULE:

Refer to Drawings for Quantities and Locations of Accessories

ITEM	MANUFACTURER	MODEL NO.
42" Grab Bar	Bobrick	B-5806.99 x 42
48" Grab Bar	Bobrick	B-5806.99 x 48
24" x 36" Mirror	Bobrick	B-1658-24x36
18" x 30" Mirror	Bobrick	B-1658-18x30
Surface Mount Soap Dispenser	Bobrick	B-2111

**SECTION 10 28 13
TOILET ACCESSORIES**

Semi - Recessed Paper Towel Dispenser & Waste Receptacle	Bobrick	B-3942
Recessed Toilet Tissue Dispenser	Bobrick	B-4388

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Provide portable fire extinguishers and cabinets and wall brackets for portable fire extinguishers with accessories as required for complete installation.

1.2 SUBMITTALS

All submittals shall be made under the provisions of Section 01 33 00.

- A. Submittal No. 10 44 16A – Product Data: Furnish manufacturer's literature.

1.3 QUALITY ASSURANCE

- A. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."

PART 2 - PRODUCTS

2.1 MATERIALS

A. Fire Extinguishers:

- 1. Typical: Provide 2A-10BC multi-purpose dry chemical type fire extinguisher.
- 2. Hazardous Areas: Provide 4A-60BC multi-purpose dry chemical type fire extinguisher at locations indicated on Drawings or designated as hazardous.

- B. semi-recessed is indicated or required, provide trim suitable for installation indicated.

1. Manufacturers:

- a. J.L. Industries/Ambassador Series.
- b. Larsen's Mfg. Co./Architectural Series.
- c. Potter-Roemer/Alta Series.
- d. Substitutions: Refer to Section 01 62 00.

- 2. Cabinet Depth: Provide cabinets designed for space available in walls with fire extinguisher cabinets, and of sufficient depth to house 2A-10BC multi-purpose dry chemical type fire extinguisher and/or Type "K" fire extinguisher.

- 3. Hazardous Areas: Provide cabinets designed to house 4A-60BC multi-purpose dry chemical type fire extinguisher at locations indicated on Drawings or designated as hazardous.

- 4. Trim: Manufacturer's standard edge trim for specified models.

- 5. Metal Gages: Provide manufacturer's standard gages for cabinets specified.

- a. Surface Mounted Cabinets: Minimum 18 gage typical, 20 gage at back.

SECTION 10 44 16
FIRE EXTINGUISHERS & CABINETS

6. Construction: Mitered and welded one-piece tubular door frames; weld joints and grind smooth; manufacturer's standard steel box with white baked enamel interior finish and primed exterior finish.
 - a. Steel Doors and Trim: Manufacturer's standard, prime coat finished.
 - b. Door Hardware: Manufacturer's standard; door to open 180 degrees.
 7. Fire Rated Wall Construction: Provide fire extinguisher cabinet manufacturer's material as required to maintain integrity of fire rated partitions where cabinets are located in fire rated partitions.
- C. Wall Bracket
1. Larsen Model No. MP5.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Examine substrates and conditions under which fire extinguisher cabinets are to be installed.
- B. Do not proceed with work until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install cabinets in locations and at mounting height to comply with requirements of governing authorities; prepare recesses in walls as required.
- B. Securely fasten to structure, square and plumb, in accordance with manufacturer's instructions.
 1. Wherever exact location of units is not shown, locate as directed by Architect.
- C. Install appropriate fire extinguisher in each cabinet.

3.3 IDENTIFICATION

- A. After installation and finishing is completed, silk screen or apply decal letters spelling "FIRE EXTINGUISHER" as applicable.
- B. Letter size, style and location as selected by Architect.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Interior Specialties
1. Assisted Listening Systems.

1.2 SUBMITTALS

- A. All submittals shall be made under the provisions of Section 01 33 00.
- B. Submittal No. 10 90 00 A – Product Data: Provide product data on specified products, describing physical and performance characteristics, sizes, as well as manufacturers installation instructions.
- C. Submittal No. 10 90 00 B – Shop Drawings: Not Required.
- D. Submittal No. 10 90 00 C – Samples: Not Required.

PART 2 - PRODUCTS

2.1 INTERIOR SPECIALTIES

- A. Assisted Listening Systems:
- a. Manufacturer: Listen Technologies Corporation – 14912 Heritage Crest Way, Bluffdale, Utah, 84065-4818, sales@listentech.com.
 - b. Systems:
 1. Multi-use Bldg Cafeteria – System for school performances and or sports activities – 1 complete system.
 - LS-07-072 15 Person Portable System (72MHZ) w/ 15 LR-400 Portable Display RF Receivers (72 mhs) and 15 LA-164 Ear Speakers
 2. Classrooms – Normal Classroom use – 2 systems.
 - LS-88 Portable 2 Person Portable System w/ 2 LR-4200 IR Intelligent DSP IR Receivers and 2 LA-430 Intelligent Ear Phone / Lanyard

PART 3 - EXECUTION – Not used

END OF SECTION

PART 1 – GENERAL

1.1 INCLUDED

- A. This Specification establishes the required standards for all labor, materials, equipment, and workmanship in connection with the furnishing, fabrication, and installation of “Plumbing.” Plumbing work includes, but is not limited to, the following items of work:
1. A complete system of soil, waste, vent, and sanitary sewer piping and structures, including provisions for mechanical equipment drainage; and connection of same to public sanitary sewers, located as indicated on the Drawings.
 2. Cold water distribution system, complete, from points of contact with site domestic water systems (located approximately as indicated on the Drawings) to all plumbing fixtures, mechanical equipment, building specialties, and Owner supplied equipment scheduled for service on the Drawings.
 3. Hot water distribution system, complete, from serving water heaters and/or points of contact with site domestic hot water, to all plumbing fixtures, mechanical equipment, building specialties, and Owner supplied equipment schedule for service on the Drawings.
 4. All plumbing fixtures and trim as scheduled on the Drawings, inclusive of setting of Fixtures and connections to drainage and water supply systems.
 5. Flashing of all plumbing pipe penetrations through exterior walls, roofs, and foundations. Sheet metal and lead flashings for pipe penetrations through roofs shall be furnished by the Plumbing Contractor and installed by the appropriate Roofing Contractor.
 6. Excavation and backfill as required for the work of this Section in conformity with Earthwork Section of the Specifications.
 7. Rough in and connection of all fixtures and equipment furnished by the Owner and/or Tenant.
 8. Final connection of water and gas to equipment furnished under other Sections.
 9. Protection of all piping specified herein and/or shown on the Drawings, from freezing. Buried piping shall be a minimum 12” below the local front line. Piping above grade in unconditioned areas shall be insulated.
 10. Testing and adjusting of all piping systems and equipment herein specified.
 11. Sterilization of domestic water systems.
 12. Pipe wrapping and insulation.
- B. Should any work or material not be included in the Drawings or Specifications but it nevertheless necessary for the proper execution of the stated scope therefore for full compliance with codes, laws, rules, and regulations, the Contractor shall understand such work and material is required, and shall perform all such work.

1.2 LICENSES, PERMITS, AND FEES

- A. The Contractor shall provide, procure, and pay for all licenses, permits, fees, etc. as required to carry on and complete their work.

1.3 CODES AND STANDARDS

- A. All work shall be done in code with all applicable local, state, and federal building safety codes, ordinances, and regulations. Additionally, all work shall conform to the following standards:
 - 1. 2016 National Fire Protection Association.
 - 2. 2016 California Mechanical Code.
 - 3. 2016 California Plumbing Code.
 - 4. 2003 Underwriters Laboratories.
 - 5. Titles 8, 17, 19, 21, 24 of the California Code of Regulations.
 - 6. 2016 California Electric Code.
- B. 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 applicable laws, ordinances, rules, or regulations. Nothing in the Contract Documents shall be interpreted as permitting work in violation of said laws, rules, and/or regulations.
- C. The Contractor for this work shall furnish, without extra charge, 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 specially set forth in the Contract Documents.

1.4 LICENSING REQUIREMENTS

- A. All plumbing systems shall be installed by a C-36 Plumbing Contractor. Plumbing systems include: waste removal and connection of on-site waste disposal systems; piping, storage tanks, and venting for supply of gases and liquids for any purpose; all gas appliances, flues, and gas connections; water and gas piping from the Owner's side of utility meter to the structure or fixed works, installation of any type of equipment to heat water or fluids to a suitable temperature; and maintenance and replacement of the items described above, including health and safety devices.

1.5 SUBMITTALS

- A. All fixtures, materials, and equipment equal in quality and utility to these herein mentioned will be accepted. When specific names are used in describing fixtures, materials, and equipment they are mentioned as standards only, but this implies no right on the part of the Contractor to use other fixtures, material, and equipment or methods, unless approved as equal in quality and utility by the Architect.
- B. 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 manufacturer's names, model numbers, and catalog sheets.
- C. 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.
- D. Submittal lists and drawings shall include identifying marks assigned by the Drawings and Specifications.
- E. Review of drawings and other material submitted shall not be construed as 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 rearrangements or construction of other work.

1.6 COOPERATION WITH OTHER TRADES

- A. Cooperate fully with other trades doing work on the project as may be necessary for the proper completion of the project. Refer to the Structural, Mechanical, 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. Any work done without regard for other trades shall be moved, replaced, or redone as required, without extra charges to Owner.

1.7 AS-BUILT DRAWINGS

- A. A complete set of Contract Drawings shall be maintained at the work site, and all changes in the work shall be recorded on this set, on a daily basis. The final as-built drawings shall be submitted to the Owner's Representative for approval.

1.8 DRAWINGS

- A. The drawings indicate diagrammatically the general layout of the plumbing systems and other related work. Field verification of scaled dimensions taken from the Drawings is required.
- B. The Contractor shall review and compare the Architectural, Structural, Plumbing, Mechanical, and Electrical Drawings and all Owner supplied equipment Drawings, and adjust their work to be in conformity with the conditions indicated thereon. Discrepancies between drawings, between drawings and actual field conditions, or between Drawings and Specifications, shall promptly be brought to the attention of the Architect for a determination of the modifications to be effected. In the event that a major modification is required, a Change Order will be prepared.

1.9 VERIFICATION OF EXISTING CONDITIONS AND DEMOLITION

- A. Before installation of any new work, verify the location, size, and other conditions at all points of connection to services or other existing piping, and at all locations where new work will cross or pass near existing piping, electrical, or other facilities.
- B. Patch, cap, or repair existing works affected by this demolition in concealed spaces within six (6) inches of a live main or branch.
- C. Deliver removed material to the Owner as directed by the Architect. Dispose of all other removed material offsite.
- D. Information shown relative to existing services is based upon available records and data during preparation of the Drawings, but shall be verified. Make reasonable deviations found necessary to conform to actual locations and conditions, without extra charge.
- E. The data given herein and on the Drawings are as exact as could be reasonably secured, but absolute accuracy is not guaranteed. Exact locations, distances, elevations, etc. will be governed by shop drawings, the building itself, and actual field conditions.

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.

1.11 SEISMIC FORCE RESISTANCE: MECHANICAL, PLUMBING, FIRE PROTECTION SYSTEMS

- A. All mechanical systems and plumbing piping systems shall adhere to the SMACNA "Seismic Restraint Manual: Guidelines for Mechanical Systems," Third Edition, dated March 2008.

1.12 DELIVERY, STORAGE, AND HANDLING

- A. Contractor shall be responsible for delivery, storage, protection, and placing of all equipment and materials.
 - 1. Contractor shall protect the work and materials from damage during construction. Equipment stored at the job site 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.
 - 2. Any items damaged shall be repaired or replaced, at no additional cost to the Owner.
- B. 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.

1.13 WARRANTIES

- A. Equipment warranties shall be provided for all equipment, with all necessary information filled in, except purchase date, in favor of the Owner.
- B. The contractor shall guarantee that all work under this Section is free from defects in material and workmanship for a period of one year from the date of filing the Notice of Completion. Replacement of defective work and damage caused to work of other trades as a result of such defective work shall be the responsibility of the Contractor, and shall be made at no cost to the Owner.

1.14 ALTERNATIVE MATERIALS AND METHODS

- A. These plans and specifications describe the general scope of the mechanical systems. These plans and specifications do not preclude the submittal of alternative methods or materials. Manufacturer's names and catalog numbers are stated to identify the type and quality of the equipment or materials required for the project.
- B. The contractor may submit shop drawings and/or technical information on alternative equipment, materials or installation details to accomplish the intent of the plans and specifications. Approval of the alternative equipment, materials or installation details shall not relieve the contractor of any responsibility for complying with the intent of the plans and specifications. Submit the manufacturers' technical information, shop drawings, and/or written description of alternative

methods for each item described by manufacturer's name and catalog number and for each component, equipment, material, or installation detail required.

1.15 SITE EXAMINATION

- A. Thoroughly examine the site and verify the actual work conditions. No extra compensation will be allowed for expenses due to failure to discover site conditions which affect the work.

PART 2 – PRODUCTS

2.1 GENERAL

- A. Only specified material shall be utilized in the work of this Section unless substitutions have been approved in accordance with the General Conditions and Division 1 Sections of the Specifications.
- B. All materials shall be new and unused, of the best quality for the intended use, and shall be listed by the ASA, AGA, and UL as meeting their requirements and bearing their label wherever standards have been established and label services are regularly furnished by them.

2.2 PIPE AND FITTINGS

A. Gas Piping

1. Above Ground - Schedule 40 black steel.
 - a. All concealed pipe and all pipe 2-1/2" and larger shall be welded. Fittings for welded pipe shall be seamless steel with welded neck.
 - b. All accessible pipe 2" and smaller shall be threaded. Fittings for threaded pipe shall be 150-lb. malleable iron, screwed and banded.
2. Below Grade – Schedule 40 black steel.
 - a. Schedule 40 black steel pipe conforming to ASTM A-120 with extruded plastic coating, threaded malleable iron fittings, wrapped with UPC-approved 20 mil PVC pipe wrap.
3. Below Grade – Polyethylene Yellow Gas Piping
 - a. Polyethylene PE2406 yellow gas piping with fuse-sealed connections and IAPMO listed anodless steel risers may be substituted for buried steel pipe if installed by contractors with qualification certificates.
 - b. Underground lines shall be Performance Pipe, "DriscoPlex 6500" PE2406 polyethylene pipe and fittings for underground gas distribution. The polyethylene plastic pipe and heat fusion fittings shall meet the requirements of ASTM D 2513.
 - c. The pipe and fitting manufacturer shall be ISO Certified in accordance with the current edition of ISO 9001 and a documented quality management system that defines product specifications and manufacturing and quality assurance procedures that assure conformance with customer and applicable regulatory requirements.
 - d. A licensed and bonded Contractor shall perform all underground gas distribution piping construction work. The Contractor shall secure all necessary permits before commencing construction.

- e. Materials used for the manufacture of polyethylene pipe and fittings shall be PE 2708 (PE2406) medium density polyethylene meeting cell classification 234373E per ASTM D 3350; and shall be Listed in Plastic Pipe Institute TR-r with standard grade HDB ratings of 1250 psi at 73°F, and 1000 psi at 140°F. All pipe and fittings materials shall be opaque yellow in color. Materials shall be stabilized against ultraviolet deterioration and suitable for outdoor storage for at least 4 years.

B. Sanitary Soil, Waste, and Vent Piping:

1. Below Ground

- a. Lines 2" and larger shall be service weight, hub-less cast iron soil pipe and fittings, and shall conform to the requirements of ASTM A 888 and CISPI Standard 301. Approved manufacturers: Charlotte, Tyler, or AB&I.
- b. Joints: Couplings shall conform to the requirements of ASTM C1540 and shall be heavy duty type 304 stainless steel shielded, having 4 sealing clamps for pipe sizes 1 ½" thru 4", and 6 sealing clamps for pipe sizes 5" thru 10". Gaskets shall comply with ASTM C-564. Anaco, Tyler, or equal.

2. Above Ground

- a. Lines 2" and larger shall be standard weight, hub-less cast iron soil pipe and fittings, and shall conform to the requirements of ASTM A 888 and CISPI Standard 301. Approved manufacturers: Charlotte, Tyler, or AB&I.
- b. Joints: Couplings shall conform to the requirements of ASTM C1540 and shall be heavy duty type 304 stainless steel shielded, having 4 sealing clamps for pipe sizes 1 ½" thru 4", and 6 sealing clamps for pipe sizes 5" thru 10". Gaskets shall comply with ASTM C-564. Anaco, Tyler, or equal.

C. Condensate Piping

- 1. Type M, hard temper, copper with wrought copper or cast brass fittings. Joints shall be made up with "Stay-Safe 50" lead free solder.

D. Cold and Hot Water Piping

- 1. All domestic cold water piping 3" and smaller shall be Type L, hard temper, copper pipe with wrought copper or cast brass solder joint fittings. All joints shall be made up with "Stay-Safe 50" lead free solder. A suitable non-corrosive flux shall be used at all joints.
- 2. Pipes below grade inside buildings shall be soft drawn, Type L or K copper with no joints below slabs. Pipes shall be sleeved with 20-mil plastic sheathing.

2.3 UNIONS

- A. Steel pipe unions shall be malleable iron, 150lb., ground joint, Grinnell Fig. 463.
- B. Copper pipe unions shall be soldered joint, Nibco series 633 or 733, Mueller, or equal.
- C. Dielectric unions shall be EPCO or equal.

2.4 VALVES, SPECIALTIES

- A. Ball Valves: Nibco T-580, bronze body, "Ring Ball," conventional port, two piece, lever handle, 125 lb.
- B. Check Valves: Nibco T-480, bronze body, inline lift type, Teflon seat, and discs, spring actuated, 125 lb.
- C. Gate Valves: 3" and smaller shall be NIBCO T134 or Stockham B-120 or B-124, bronze body, union bonnet, rising stem, solid wedge, 150 lb. with wheel handle.
- D. Gas Shut-off Valves:
 - 1. At Building Service: Homestead Fig. 601, semi-steel, lubricated plug, lever handle, 200. Lb. Install CALIFORNIA Series 300 seismic actuated shut off valve at entrance to building. Brace per manufacturer's instructions.
 - 2. At Connection to Equipment: Jomar T-203 gas ball valves, ¼-turn, hot forged brass, 2-piece design, standard port, appliance type with side tap/drain. Provide with ADA certified stainless steel flex connection 12" max.
- E. Check Valves: NIBCO T-413, Stockham B-345, bronze body, Y-pattern lift type, Class 200.
- F. Gas Shut-off Valves: Homestead Fig. 601, semi-steel, lubricated plug, lever handle, 200 lb.
- G. Relief Valves: Water heater temperature/pressure relief valve, Watts, M&M, or equal with ASME rating, and AGA certified design. Set at 125 psi and 210°F.
- H. Backflow Preventers (where shown on the Drawings or required by local code):
 - 1. Atmospheric type; Wilkins #35 series.
 - 2. Pressure type: Wilkins #720A series.
 - 3. Reduced pressure type:
 - a. ¼" to 2" – Wilkins #975-XLMS series.
 - b. 2 ½" to 10" – Wilkins #375 series.
- I. Water Pressure Regulating Valves: Wilkins 500 YSBR series. Install where pressure to building exceeds 70 psi.
- J. Gas Pressure Regulators: American Regulator, Series 1813C. Regulators shall be sized for full gas capacity of equipment as scheduled on the Drawings. Inlet pressure shall be 5 psig. Outlet pressure shall be 7" water column. Regulators installed indoors shall have relief opening piped to outdoors. Size relief pipe in accordance with ANSI Z223.1 "National Fuel Gas Code."

2.5 HANGERS, SUPPORTS

- A. Installation of piping shall be such that damage cannot result through loading, expansion, or contraction of piping. Anchors shall be installed to obtain uniformity of pipe movement.
- B. Pipe supports shall be spaced sufficiently close to support pipes properly without formation of pockets. Hangers shall be installed at ends of mains and branches and maximum intermediate spacing shall be as follows:

	MAXIMUM SPACING, (FT.)		MINIMUM ROD DIAMETER	
	Pipe Diameter, Inches		Pipe Dia.	Rod Dia.
	1" & Less	1-1/4" & More	Inches	Inches
Steel	8	10	2 & Less	3/8
Copper	6	8	2-1/2 to 3	1/2
Cast Iron	5 (One min. per length & fitting)		4 & Larger	5/8

- C. Pipe hangers shall be Superstrut, B-Line, or equivalent Grinnell. All hangers shall be electrochromate finished. Hanger rods shall have electro-galvanized finish.
- D. Steel pipe, cast iron soil pipe: C-711 pipe hangers.
- E. Copper tubing: C-711 pipe hanger complete with C-716 isolator.
- F. Insulated pipe: C-711 pipe hanger fitted to outside of insulation with C-790 galvanized shields.
- G. Trapeze Hangers
 - 1. Grouped pipes may be supported by A-1200 channel bolted to rods.
 - 2. Copper and steel pipe shall be attached to channels with A-716 "Cush-A-Clamp."
- H. Cast iron soil pipe shall be supported with C-711 pipe hangers with rods attached to the bottom of channels.
- I. Point of Support Connectors
 - 1. Wood Construction
 - a. 540 side beam hanger for stationary pipes.
 - b. S-541 for pipes subject to movement.
 - 2. Vertical Pipe Risers: Vertical pipes risers shall be securely supported with C-720 pipe clamps (C-720P for bare cold water pipe) anchored to construction.
- J. Provide resilient mounting for domestic water piping. Thermal insulation may serve as resilient mounting for insulated piping.
- K. Suspended water piping shall be anchored with steel struts installed at midpoint of each run.
- L. No valve or piece of equipment shall be used to support piping.

2.6 CLEANOUTS

- A. Cleanouts in membrane damp-proofed floors shall have flashing flange and membrane clamps. Plugs shall be bronze, with cast iron body ferrule for cast iron pipe.
- B. Floor Cleanouts (FCO): Zurn ZN 1400-HD, "Level-trol" adjustable cleanouts, dura-coated cast iron with gas and water-tight ABS tapered thread plug, and round scoriated top, adjustable to finished floor .
- C. Grade Cleanouts (GCO): Zurn Z-1474-IN or equal JR Smith. Housing to be dura-coated cast iron body with integral anchor flange and scoriated cover with lifting device. Cleanouts in un-paved areas shall be set in 18" x 18" x 4" co

D. Wall Cleanouts (WCO):

1. Copper tubing: Nibco Figure 816 or 817, with Zurn Z-1462, 6" x 6" polished chrome-plated bronze wall plate and frame.
2. Cast iron pipe: Zurn Z-1441, dura-coated with gas and water-tight bronze, taper thread plug and round smooth stainless steel access cover with securing screw.
3. Steel pipe: Zurn Z-1468, round stainless steel wall access cover, complete with securing screw and bronze raised hex head plug for steel pipe.

2.7 SLEEVES, WALL PLATES

- A. Service pipe through exterior wall, roofs: Crane Style BC wall and ceiling plates; chrome plated at finished rooms.
- B. Pipes through, under footings: 18 gauge iron sleeves two diameters larger than pipe, cast in concrete, annular space filled with mastic or plastic bituminous cement.
- C. Pipes through fire rated walls shall be protected with fire retardant mastic as detailed on the Drawings. Installation shall be in full accordance with the requirements of the UL system number. Hilti or approved equal.
- D. Wall and ceiling plates: Crane Style BC or equal; chrome plated at finished rooms.
- E. Pipes through floors, interior concrete walls, and through fire rated wall and smoke stop partitions: 18 gauge iron sleeves, two diameters large than pipe, annular space filled with 3M Brand Fire Barrier CP-25 caulk.
- F. Pipes through 1-hour walls shall be protected with fire retardant mastic as detailed on the Drawings. Installation shall be in full accordance with the requirements of the UL system number. Hilti or approved equal.

2.8 ACCESS DOORS

- A. Where construction is not inherently accessible, provide adequately sized and conveniently located access doors in ceiling, walls, and furring for servicing vales, equipment, etc.
- B. Access doors shall be Karp, Milcor, or equal, prime coated steel for all surfaces except ceramic tile, 12" x12" minimum size as required. Locks shall be flush, screwdriver operated.
 1. Style KDW for gypsum board surfaces.
 2. Style PL for plaster surfaces.
 3. Style 210 for acoustic tile surfaces.
 4. Style DSC 214-M satin finish stainless steel at ceramic tile surfaces.
 5. Style "Fire Rated" at rated ceilings and walls.

2.9 PIPE INSULATION

- A. Insulate all hot water supply piping, all hot water return piping, all cold water supply piping in exterior walls or unconditioned spaces with Manville "Micro-Lok" 650, Fiberglass, Certainteed, or

equal, rigid fiberglass one-piece pipe insulation with and all purpose jacket. Jackets shall be constructed of high density, white kraft bonded to aluminum foil with fiberglass yarn, with a pressure sensitive closure system.

- B. All insulation shall have composite (insulation, jacket, and adhesive used to adhere the jacket to the insulation) Fire and Smoke Hazard ratings as tested under procedure ASTM E-84, NFPA 255 or UL 723, not exceeding: Flame Spread – 25, Smoke Developed – 50.
- C. Inserts shall be installed at outside hangers. Inserts between the pipe and pipe hangers shall consist of rigid pipe insulation of thickness equal to the adjoining insulation. Inserts shall not be less than 10" long for pipe sizes through 2 ½" and not less than 12" long for pipes larger than 2 ½".
- D. Metal shields shall be applied between hangers or supports and the pipe insulation. Shields shall be formed to fit the insulation and shall extend up to the centerline of the pipe and the length specified for hanger inserts.
- E. Insulation thickness shall be as follows:
 - 1. All piping 1" and smaller: 1"
 - 2. All piping 1 ¼" and larger: 1 ½"

2.10 PIPE LABELS

- A. All new domestic cold water, hot water, and hot water recirculation piping shall be clearly labelled.
- B. Industrial safety solutions piping labels shall be rated for indoor and outdoor use and be attached with permanent adhesive.
- C. Labels shall show the direction of flow and indicate the process media. Pipe labeling color and text size shall conform to ANSI/ASME A13.1-2007. Process piping shall be labeled a minimum of twice per room in locations designated by the Engineer.

2.11 FIXTURES

- A. The quantity and location of fixtures shall be taken from the Architectural and Plumbing Drawings. Provide adequate supports and all standard trim normally furnished for fixtures. All enamel shall be acid resisting. Traps, unless otherwise noted shall be 17 gauge brass tubing, chrome plated when exposed.
- B. Except as otherwise shown, provide ¼" steel backing plates, 36" wide by 12" high minimum size, secured to a minimum of three studs by welding, or with ¼" x 2 ½" lag screws for all wall hung fixtures for which no other means of support is specified.
- C. Stops and supplies: Provide stops for all fixtures. Unless otherwise specified, stops exposed at lavatories and similar fixtures shall be Chicago #1016-ABCP, chrome plated, loose key. Concealed stops shall be Chicago #1771.
- D. All fixtures shall meet or exceed the requirements of the California Administrative Code, Title 24, Part 5.

2.12 SHOCK ABSORBERS

- A. Zurn, "Shoktrol," or equal JR Smith, stainless steel bellows. Install with gate valve shut-off and access door at all flush valves or other automatic valves. A single unit sized in accordance with the manufacturer's recommendations may serve batteries of valves.

2.13 VALVE BOXES

- A. Christy #F-08, complete with concrete cover and required extensions. Index all covers "GAS" or "WATER" as required for service use.

PART 3 – EXECUTION

3.1 SURFACE CONDITIONS

- A. This Contractor shall be held to have examined the site and compared it with the Contract Documents, and to adequately understand the conditions under which the work is to be performed. In the event of discrepancy, this Contractor shall notify the Architect and proceed as directed. This Contractor shall be held responsible for all existing conditions, whether or not accurately described, and no allowance shall subsequently be made on his behalf for any error, omission, or extra expense due to failure or neglect to make such examination and notification.
- B. Prior to commencing the work of this Section, this 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.

3.2 ACCESSIBILITY

- A. Equipment shall be placed and piping connections made in such a manner that all routine adjustments and maintenance operations may be carried out without inconvenience and so that all code requirements for clearances are maintained.

3.3 VIBRATION AND SOUND CONTROL

- A. Make all necessary provisions to prevent the transmission of vibration to the building structure, including flexible pipe connections to motor driven equipment, resilient mounting for piping, and sealing off pipe and duct penetrations of walls and roof.

3.4 INSULATION

- A. Insulation shall be applied in complete accordance with the manufacturer's published installation instructions. All insulation shall be applied on clean, dry surfaces and shall be continuous through wall and ceiling opening and sleeves. All joints shall be firmly butted together and longitudinal jacket laps and butt strips shall be smoothly secured. Specified adhesives, mastics, and coatings shall be applied at the manufacturer's recommended minimum coverage per gallon.

3.5 PIPING INSTALLATION – GENERAL

- A. Rough in shall proceed as rapidly as general construction will permit. All rough-in shall be complete, at locations verified by Architect and Owner, and tested and inspected prior to installation of concrete, lath, plaster, gypsum wallboard, or other finishes.
- B. All piping shall be concealed in finished rooms, installed in furred walls and partitions. Where furred or suspended ceilings occur, piping shall be installed in the concealed space at points adjacent to beams and/or other structural members, and coordinated with ductwork and equipment. Where exposed piping occurs, it shall be installed parallel to or at right angles to building walls, unless specifically shown otherwise on the Drawings.

- C. Installation of piping shall be such that damage cannot result, through thermal expansion or contraction, to piping, building, or pipe hangers and supports. Anchors shall be installed at midpoints of all runs in main piping for the purpose of localizing pipe expansion or prevention of creepage.
- D. All pipe lines shall be installed free from traps and air pockets, true to line and grade, with suitable supports properly space. All piping shall be installed without undue stresses and with provision for expansion and contraction.
- E. All piping shall be new and free from foreign substances. American standard pipe threads shall be used for IPS threaded work. Joints in threaded piping shall be made up with Teflon tape applied to the male threads only. No screwed pipe joints shall be caulked or packed with rope or other packing materials. Pipe shall be free from tool marks, threads cut accurately with not more than two (2) threads showing beyond fitting. Friction wrenches shall not be used with plated, polished, or soft metal piping. All changes in pipe size shall be made with reducing fitting. Bushings will not be permitted.
- F. Protect unattended openings in piping during construction.
- G. No water or drainage piping shall pass over electrical equipment unless adequate protection is provided to prevent damage by leaks or condensation.
- H. All copper tubing shall be formed in a workmanlike manner, in accordance with the Pipe and Tube Bending Handbook of the Copper and Brass Research Association. A tube bender giving support to the periphery of the tube shall be used. The tubing shall be protected against flattening or other injury.
- I. All copper connections and joints shall be made in accordance with the Copper Tube Handbook, Copper and Brass Research Association. No swaged connections will be permitted. All valves, pumps, and similar equipment shall be connected to copper piping through union or flange adapter fittings.
- J. Valves, cocks, etc., shall be installed to allow convenient accessibility and operation.
- K. Unions and flanges shall be installed to allow convenient replacement of all equipment and clearing tubes.
- L. A union connection shall be installed downstream from all valves, at equipment connections and at other locations as required or directed.
- M. Shut off valves shall be provided in all main services, and where required to permit proper servicing of equipment. Valves of one type shall be of one manufacturer.
- N. All valves shall be of the same size as the pipelines in which they are installed, unless specifically sized on the Drawings. All hand controlled line valves shall be ball valves, except where throttling control or frequent operation is required, in which case globe or angle valves shall be used. Globe valves in horizontal lines shall be installed with stem in horizontal to permit line draining. All globe and angle valves shall be installed to close against pressure. Disc valves shall have discs suitable for the services for which they are to be used.
- O. All valves shall be accessible and shall not be installed with the stems below the horizontal plane. Provide access panels at walls, ceilings, or floors.
- P. Provide prime coated escutcheon plates at all points where exposed piping penetrates finished wall ceilings or floors.

- Q. Cutting or boring of joists or other structural members shall be done only when alternative routing is impossible and only upon written approval of the Architect or Owner.

3.6 INSTALLATION, PIPING

A. Gas Piping

1. Gas piping shall slope back to meter, where possible.
2. Bottom of vertical gas lines shall be fitted with 6" long capped drip legs.
3. In addition to the main shut-off valve, a gas stopcock shall be installed at each piece of gas-fired equipment.

B. Condensate Piping

1. Indirect waste piping shall be installed to a uniform minimum grade of $\frac{1}{4}$ " per foot unless otherwise noted.
2. Changes in direction of indirect waste piping shall be accomplished by the use of appropriate drainage fittings.
3. Drilling and tapping of indirect waste pipes and the use of saddle hubs and bands are prohibited.

C. Flashing

1. All roof and wall penetrations shall be flashed and counterflashed water tight with 26 gauge sheet metal, except as noted.
2. Vents through roof shall be flashed with Semco #1100-4 lead flashing assemblies. Flashing shall extend over top of pipe and shall be turned down inside top of pipe.

D. Soil, Waste, Vent, Drain Piping

1. Soil, waste, and vent piping occurring within the building shall be installed to a uniform minimum grade of $\frac{1}{4}$ " per foot unless otherwise noted. Vent piping shall be graded so that all condensation shall flow directly to a soil or waste line.
2. Changes in direction of drainage piping shall be accomplished by the use of appropriate drainage and sanitary fittings.
3. Protection against breakage of piping passing under or through walls shall be provided using specified sleeves and caulking.
4. Adapters shall be installed between threaded iron and soil pipe.
5. Test tees shall be installed at the foot of all soil, waste, and storm water stacks.
6. Cleanouts shall be located where indicated on the Drawings; at all horizontal offsets; at ends of waste or sewer branches more the 5' in length; at intervals of 100' in straight runs of piping, or at closer intervals if directed or required by local code. Location of cleanouts in finished spaces shall be approved by the Architect prior to installation.

E. Hot and Cold Water Systems

1. Di-electric unions shall be installed where copper pipe is connected to galvanized steel piping or stub outs.
2. Connections from copper pipe to fixture supply fittings shall be made with copper or brass nipples.
3. All domestic water piping shall be kept clear of the building structure. Where it is within 1" of the building structure, it shall be wrapped with felt (3/16" minimum thickness).
4. To the greatest extent possible, domestic cold water piping shall be kept separated from hot piping and where there is a choice shall be run in the coolest portion of the available space.

F. Plumbing Fixtures

1. Space between wall mounted fixtures and wall surface shall be neatly pointed up with silicone rubber compound of color matching fixture.
2. All exposed bolt heads and nuts used to secure fixtures shall be concealed with vitreous china caps.

G. Excavation and Backfill

1. Provide all excavation, trenching, and backfill in connection with the work of this Section.
2. Excavation shall be carried to 4" below the bottom of pipes. Provide a sand bedding for all sloped drainage piping, and provide smooth uniformly graded bedding of firm but yielding material for all other piping, catch basins, and similar structures.
3. Backfill material shall be non-corrosive and free from all foreign material that could damage pipes. Backfill shall be placed in 6" layers, each layer tamped, and compacted to 95% of maximum dry density (ASTM D-1557-64T (c) compaction test procedure).

H. Storm Drainage Piping

1. Roof drains shall be installed where indicated on the Drawings, in conjunction with work specified in "Membrane Waterproofing" Section. This Contractor shall be responsible for a watertight installation.
2. Rain water leaders connected to roof drains and gutter systems shall be standard weight galvanized steel pipe and fittings, except where otherwise noted, and shall be continuous from drain to connection with underground storm water drainage facilities. Provide a cleanout at the base of all vertical to horizontal transitions.
3. Sheet metal downspouts are furnished and installed by others.
4. Downspouts inside building, if shown, shall be continuous from drain to curb or connection with underground storm water drainage facilities. Provide a cleanout at the base of all vertical to horizontal transitions.
5. Insulate storm drain piping where it is located above a ceiling or within a concealed space. Overflow piping is not required to be insulated.

3.7 INSTALLATION, HANGERS & SUPPORTS

- A.** Installation of piping shall be such that damage cannot result through loading, expansion, or contraction of piping. Anchors shall be installed to obtain uniformity of pipe movement.

- B. Hanger rod sizes shall be no smaller than 3/8-inch for pipe and tube sizes 1/2 to 4 inches and 1/2 inch for sizes 5-8 inches.
- C. Pipe supports shall be spaced sufficiently close to support pipes properly without formation of pockets. Hangers shall be installed at ends of mains and branches. Maximum horizontal support spacing shall be as follows:
 - 1. Steel Pipe for Water or DWV: 10 feet for pipe sizes 3/4 inch and smaller and 12 feet for sizes 1 inch and larger.
 - 2. Steel and Tinned Copper Pipe for Gas: 6 feet for 1/2 inch pipe; 8 feet for sizes 3/4 to 1 inch, and 10 feet for sizes 1 1/4 inch and larger.
 - 3. Copper Tube and Pipe, soldered or brazed: 6 feet for pipe sizes 1 1/2 inches and smaller and 10 feet for sizes 2 inches and larger.
 - 4. Hubless Cast-Iron shall be supported at every other joint, unless over 4 feet, then support each joint. Support adjacent to joint, not to exceed 18 inches, brace at not more than 40 foot intervals to prevent horizontal movement. Support at each horizontal branch connection. Hangers shall not be placed on the coupling.
- D. Provide resilient mounting for domestic water piping. Thermal insulation may serve as resilient mounting for insulated piping.
- E. Suspended water piping shall be anchored with steel struts installed at midpoint of each run.
- F. No valve or piece of equipment shall be used to support piping.
- G. Pipes through studs or joists shall be isolated from structure with properly sized Hubbard "Hole-Rite" suspension clamps.

3.8 TESTING, INSPECTIONS

A. General

- 1. This 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 jurisdictions 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 that may have been damaged, to be in conformity with the Contract Documents.

B. Tests

- 1. This Contractor shall make all tests required by all local, state, and federal laws, codes, ordinances, and regulations having jurisdiction over this work.
- 2. 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.
- 3. Water Piping shall be hydrostatically tested for 6 hours at 150 psi. All equipment shall be tested water tight at utility pressure.

4. Drainage and Vent Piping shall be tested for 1 hour by plugging all outlets and filling the pipes with water to the top of vertical sections of pipes. No loss of water shall be permitted.

3.9 DOMESTIC WATER SYSTEM STERILIZATION

- A. Upon completion of this work, the domestic water system shall be thoroughly flushed, sterilized, and refushed. Sterilization and refushing shall be performed using the following procedure.
 1. All work shall be performed in the presence of the inspector.
 2. Introduce chlorine or a solution of sodium hypochlorite, filling the lines slowly and supplying the sterilization agent at a rate of 50 parts of chlorine per million, as determined by residual chlorine tests at the ends of all branches. Open and close all valves while the system is being chlorinated to insure uniform distribution.
 3. After the sterilizing agent has been applied for 24 hours, test for residual chlorine at the ends of the branches. If less than 5 ppm is indicated, repeat the sterilization procedure.
 4. When tests show at least 5 ppm of residual chlorine, flush out the system until all traces of the chemical are removed.
- B. After a period of 48 hours minimum, bacteriological tests, using samples from at least 3 representative points shall be made by recognized testing agency, who shall certify to the Architect that the system is bacteriologically safe and at least equal in safety to that of the principal water supply. The laboratory report and certification shall be transmitted to the Architect and Owner.

3.10 ADJUSTING

- A. Properly adjust all stops, and controls, and demonstrate safe and satisfactory operation of all equipment.

3.11 CLEANING

- A. Flush all water piping systems. Remove, clean, and replace all strainer baskets prior to final inspection.
- B. Blow out all compressible fluid piping with compressed air before connecting with regulators or equipment.

3.12 CLEANUP

- A. Upon completion of the work of this Section, remove all surplus material, debris, and equipment associated with or used in the performance of this work.

END OF SECTION

PART 1 – GENERAL

1.1 INCLUDED

- A. This section covers mechanical work, complete. Work includes furnishing, installing, calibrating, adjusting, testing, documenting, and starting up equipment in accordance with these Specifications, the accompanying Plans, and the directions of the Engineer.

1.2 LICENSES, PERMITS, AND FEES

- A. The Contractor shall provide, procure, and pay for all licenses, permits, fees, etc. as required to carry on and complete their work.

1.3 CODES AND STANDARDS

- A. All work shall be done in code with all applicable local, state, and federal building safety codes, ordinances, and regulations. Additionally, all work shall conform to the following standards:
 - 1. 2016 National Fire Protection Association.
 - 2. 2016 California Mechanical Code.
 - 3. 2016 California Plumbing Code.
 - 4. Underwriters Laboratories.
 - 5. Titles 8, 17, 19, 21, 24 of the California Code of Regulations.
 - 6. 2016 California Electric Code.
 - 7. SMACNA Standards.
 - 8. ASHRAE Standards 55 and 62.1.
- B. 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 applicable laws, ordinances, rules, or regulations. Nothing in the Contract Documents shall be interpreted as permitting work in violation of said laws, rules, and/or regulations.
- C. The Contractor for this work shall furnish, without extra charge, 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 specially set forth in the Contract Documents.

1.4 LICENSING REQUIREMENTS

- A. All work of Division 22 and 23 shall be performed by an appropriately licensed contractor. The licenses shall be current, valid through the term of the contract and in the name of the contractor.
 - 1. All HVAC work, which includes warm air heating systems and water heating pumps, ventilating systems, air conditioning systems, and ductwork, registers, flues, humidity, and thermostatic controls in connection with these systems, shall be performed by a C-20 – Warm-Air Heating, Ventilating and Air-Conditioning Contractor.
- B. All hydronic piping systems shall be installed by a C-4 – Boiler, Hot Water Heating and Steam Fitting Contractor.

1.5 SUBMITTALS

A. General Requirements

1. Submittal lists and drawings shall include identifying marks assigned by the Drawings and Specifications.
2. Review of drawings and other material submitted shall not be construed as 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 rearrangements or construction of other work.
3. All fixtures, materials, and equipment equal in quality and utility to these herein mentioned will be accepted. When specific names are used in describing fixtures, materials, and equipment they are mentioned as standards only, but this implies no right on the part of the Contractor to use other fixtures, material, and equipment or methods, unless approved as equal in quality and utility by the Architect.
4. 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 manufacturer's names, catalog number, capacity, size, power requirements, etc.
5. 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.

B. Submittal – Product Data

1. Submit manufacturer's product data for all HVAC equipment, in compliance with specifications.

1.6 COOPERATION WITH OTHER TRADES

- A. Cooperate fully 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. Any work done without regard for other trades shall be moved, replaced, or redone as required, without extra charges to Owner.

1.7 DIVISION OF WORK BETWEEN DIVISIONS 23 AND 26

- A. Close coordination between the electrical and mechanical trades is a part of the work that is required by this contract. No allowance will be made for omissions based on incorrectly assuming another trade will be performing your work. Confirm your scope of work with the general contractor.
- B. The division of responsibilities between trades supplying equipment in other Divisions may be different. For instance, Division 26 contractor may be required to supply disconnect switches and starters for non-HVAC mechanical equipment supplied under other Divisions.

C. Division 23 Responsibilities

1. Assume responsibility for the proper functioning of the HVAC systems in their entirety.

2. Furnish and install all conductors and conduit required for control of HVAC equipment.
3. Make all terminations with the exception of power conductors.
4. Furnish and install all control panels and devices to provide a complete and functional controls system, including all controls transformers.
5. Furnish and install motor starters for all equipment specified in Division 23.
6. Install duct smoke detectors furnished by fire alarm contractor in buildings with fire alarm systems.
7. Furnish and install duct smoke detectors in buildings without fire alarm systems.
8. Furnish and install all control conductors and conduit connecting duct smoke detectors to smoke dampers and fan start controls.
9. All electrical work performed under Division 23 shall conform to the requirements of Division 26.

D. Division 26 Responsibilities

1. Furnish and install all raceways, conduit, disconnect switches, and conductors necessary for electrical power supply.
2. Make all power supply terminations to motors, starters, disconnect switches, control transformers, and other mechanical devices.
3. Fire alarm contractor to furnish duct smoke detectors in buildings with fire alarm systems.
4. Provide power to all duct smoke detectors and smoke dampers.
5. Coordinate all work with mechanical contractors.

1.8 AS-BUILT DRAWINGS

- A. A complete set of Contract Drawings shall be maintained at the work site, and all changes in the work shall be recorded on this set, on a daily basis. The final as-built drawings shall be submitted to the Architect for approval.

1.9 DESIGN DRAWINGS

- A. The drawings indicate diagrammatically the general layout of the mechanical systems and other related work. Field verification of scaled dimensions taken from the Drawings is required.
- B. The Contractor shall review and compare the Architectural, Structural, Plumbing, Mechanical, and Electrical Drawings and all Owner supplied equipment Drawings, and adjust their work to be in conformity with the conditions indicated thereon. Discrepancies between drawings, between drawings and actual field conditions, or between Drawings and Specifications, shall promptly be brought to the attention of the Architect for a determination of the modifications to be effected. In the event that a major modification is required, a Change Order will be prepared.

1.10 VERIFICATION OF EXISTING CONDITIONS AND DEMOLITION

- A. Before installation of any new work, verify the location, size, and other conditions at all points of connection to services or other existing piping, and at all locations where new work will cross or pass near existing piping, electrical, or other facilities.
- B. Remove ductwork, piping, controls, fixtures, and equipment that is not to remain in service as shown on the Drawings or as required. This included the removal of associated appurtenances and supports.
- C. Patch, cap, or repair existing works affected by this demolition in concealed spaces within six (6) inches of a live main or branch.
- D. Deliver removed material to the Owner as directed by the Architect. Dispose of all other removed material offsite.
- E. Information shown relative to existing services is based upon available records and data during preparation of the Drawings, but shall be verified. Make reasonable deviations found necessary to conform to actual locations and conditions, without extra charge.

1.11 OPERATING AND MAINTENANCE INSTRUCTIONS

- A. Furnish three sets of typewritten instructions covering maintenance, adjustment, and operation of each piece of apparatus, bound in a hard cover loose-leaf binder. Neatly obscure or cross out inapplicable data from manufacturer's literature. Submit data to the Architect.
- B. Operating instructions shall show sequence of operations, lubrication, care, and maintenance requirements of all equipment. Final acceptance of the work will not be made until a satisfactory submission of this material is received and approved by the Architect.
- C. The Owner's authorized representative shall be instructed in the operation and servicing of all HVAC & plumbing systems.

1.12 ACCURACY OF DATA

- A. The data given herein and on the Drawings are as exact as could be reasonably secured, but absolute accuracy is not guaranteed. Exact locations, distances, elevations, etc. will be governed by shop drawings, the building itself, and actual field conditions.

1.13 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.

1.14 SEISMIC FORCE RESISTANCE: MECHANICAL, PLUMBING, FIRE PROTECTION SYSTEMS

- A. All mechanical systems and plumbing piping systems shall adhere to the SMACNA "Seismic Restraint Manual: Guidelines for Mechanical Systems," Third Edition dated March 2008.

1.15 DELIVERY, STORAGE, AND HANDLING

- A. Contractor shall be responsible for delivery, storage, protection, and placing of all equipment and materials.
 - 1. Contractor shall protect the work and materials from damage during construction. Equipment stored at the job site 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.

2. Any items damaged shall be repaired or replaced, at no additional cost to the Owner.

B. 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.

1.16 WARRANTIES

- A. Equipment warranties shall be provided for all equipment, with all necessary information filled in, except purchase date, in favor of the Owner.
- B. The contractor shall guarantee that all work under this Section is free from defects in material and workmanship for a period of one year from the date of filing the Notice of Completion. Replacement of defective work and damage caused to work of other trades as a result of such defective work shall be the responsibility of the Contractor, and shall be made at no cost to the Owner.

1.17 SITE EXAMINATION

- A. Thoroughly examine the site and verify the actual work conditions. No extra compensation will be allowed for expenses due to failure to discover site conditions which affect the work.

PART 2 – PRODUCTS

2.1 GENERAL

- 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. 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 manufacturer's written instructions. Refer conflicts between manufacturer's instructions and the contract drawings and specifications to the Architect for resolution.

2.2 MODULATING FURNACES

- A. Variable capacity condensing gas furnace with variable speed ECM blower motor
- B. Fully modulating gas valve in 1% increments from 40% to 100%.
- C. Aluminized steel, clam shell primary heat exchanger for non-condensing sections. Stainless steel fin and tube design for condensing heat exchanger.

- D. Multipoise design allows one model for downflow or horizontal units.
- E. Sealed combustion with direct venting.
- F. CSA design certified for use with natural gas and propane.
- G. AHRI efficiency rated.

2.3 VARIABLE SPEED CONDENSING UNITS.

- A. Variable speed air cooled inverter compressor, ranging from 40% to 100%.
- B. Thermostatic expansion valve for cooling.
- C. Microtube technology refrigeration system.
- D. Internal crankcase heater.
- E. Front-seating service valves.
- F. AHRI efficiency rated.
- G. See plans for performance and efficiency ratings.

2.4 HEAT RECOVERY VENTILATOR

A. Case

- 1. Case shall be constructed of 20 gauge G90 galvanized steel sheet coated with baked powder paint.
- 2. Case shall be insulated with 1" foil-faced high density polystyrene foam.
- 3. Case shall have hinged or screwed access panels on front and back. Cores, drain pan, and motors are serviceable from either side of unit.

B. Heat Recovery Core

- 1. Core shall be fixed plate cross-flow heat exchanger using aluminum alloy 1100 or polymerized paper and capable of transferring sensible heat between air streams.
- 2. Core shall have turbulence inducing geometry.
- 3. Plates shall be hemmed to avoid cross contamination of airstreams.
- 4. Cores are mounted in slide-out rails for ease of inspection, removal and cleaning.
- 5. Core shall have a thermal effectiveness of 70% at 400cfm in heating condition.

C. Blowers

- 1. Unit shall have two backward inclined motorized impellers with permanently lubricated sealed ball bearings and thermal over load protection

2. Fan assemblies are mounted on a removable sliding base.

D. Controls

1. External three position rocker switch that offers continuous ventilation.

E. Filters

1. Unit shall have field fabricated external filter rack.

2. Filter shall have a nominal size of 16" x 16" x 2".

3. Pleated MERV8 panel filter evaluated under ASHRAE testing standard 52.2.

4. Filter shall be constructed of cotton and synthetic fibers in a uniform lofted media blanket.

2.5 SPLIT SYSTEM UNITS (FC-1A through FC-9C, HP-1 through HP-9)

A. General

1. Provide split system multi-zone ceiling cassette and wall mount unit by Daikin, Mitsubishi, or LG.

2. Indoor unit to be ceiling-mounted or wall mounted, as shown on the contract drawings.

B. Indoor Unit Fan

1. The evaporator fan shall be an assembly consisting of a direct-driven fan by a single motor.

2. The fan shall be statically and dynamically balanced and operate on a motor with permanent lubricated bearings.

3. An auto-swing louver for adjustable air flow (both vertically and horizontally) is standard via the wireless remote control furnished with each system.

4. The indoor fan shall offer a choice of five speeds, plus quiet and auto settings.

C. Indoor Unit Coil

1. The evaporator coil shall be a nonferrous, aluminum fin on copper tube heat exchanger.

2. All tube joints shall be brazed with silver alloy or phoscopper.

3. All coils will be factory pressure tested.

4. A condensate pan shall be provided under the coil with a drain connection.

D. Outdoor Unit - General

1. The outdoor unit shall be specifically matched to the corresponding indoor unit size. The outdoor unit shall be complete factory assembled and pre-wired with all necessary electronic and refrigerant controls.

2. The outdoor unit shall be completely weatherproof and corrosion resistant. The unit shall be constructed from rust-proofed mild steel panels coated with a baked enamel finish.

2.6 DIRECT DRIVE BACKWARD INCLINED CENTRIFUGAL CEILING EXHAUST FAN (EF-1, EF-2)

- A. Greenheck SP, or approved equal, as scheduled on drawings
- B. Housing/Cabinet Construction
 - 1. Construction material: Aluminum
 - 2. Square design constructed of heavy gauge galvanized steel and shall include square duct mounting collars
 - 3. Housing and bearing supports shall be constructed of heavy gauge bolted and welded steel construction to prevent vibration and to rigidly support the shaft and bearing assembly.
- C. Wheel
 - 1. Non-overloading, backward inclined centrifugal wheel
 - 2. Constructed of aluminum
 - 3. Statically and dynamically balanced in accordance to AMCA Standard 204-05
 - 4. The wheel cone and fan inlet will be matched and shall have precise running tolerances for maximum performance and operating efficiency
 - 5. Single thickness blades are securely riveted or welded to a heavy gauge back plate and wheel cone.
- D. Electronically Commutated Motor
 - 1. Motor enclosures: Open type
 - 2. Motor to be a DC electronic commutation type motor (ECM) specifically designed for fan applications. AC induction type motors are not acceptable. Examples of unacceptable motors are: Shaded Pole, Permanent Split Capacitor (PSC), Split Phase, Capacitor Start and 3 phase induction type motors.
 - 3. Motors are permanently lubricated, heavy duty ball bearing type to match with the fan load and pre-wired to the specific voltage and phase.
 - 4. Internal motor circuitry to convert AC power supplied to the fan to DC power to operate the motor.
 - 5. Motor shall be speed 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.
 - 6. Motor shall be a minimum of 85% efficient at all speeds.

2.7 DUCTWORK

- A. Sheet Metal Ductwork – Rectangular
 - 1. Ducts and plenums shall be fabricated and installed in conformance with the latest editions of: NFPA Pamphlet No. 90A; California Building Code; California Mechanical Code and the SMACNA HVAC Duct Construction Standards (Metal and Flexible). Ducts and plenums shall be constructed of hot dipped galvanized mild steel and shall have airtight Class “B” seals at all transverse joints and longitudinal seams. Tables and figures hereinafter referenced are from the 2005 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. 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. Lined ducts shall be fabricated such that the net inside dimensions equals the duct sizes shown on the Drawings.

B. Sheet Metal Ductwork – Spiral

1. Round ducts shall be spiral, United McGill 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.

C. Flexible Ductwork

1. Flexible ducts shall be Flexmaster “8M” 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 7 ft. Galvanized sheet metal elbows shall be used for turns greater the 45° on flexible ducts 10” 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.

D. Supports

1. 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 eight feet for rectangular ducts and twelve feet for round ducts. Attachments to the structure shall be made with adequately sized lag bolts for straphangers 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 Figure 5-8 and 5-9.

E. Specialties:

1. Duct Access Doors: Including those for removing filters, duct access doors shall be as detailed in Figure 7-2 with sash locks, piano hinges, and gaskets. Access doors shall have an unobstructed full swing.

2.8 DUCTWORK ACCESSORIES

A. Flexible Duct Connections

1. Duro-Dyne “Metal-Fab” with Duroion, Ventfabrics “Ventglass,” or approved equal.
2. Install at each point where a blower unit is connected to a duct. A minimum clearance of three inches between the duct and the source of vibration shall be maintained. Install per Figure 2-17.

B. Screens

1. Install removable bird screens at all outside 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.

C. Joints

1. Tape all joints airtight using Hardcast type "DT" pressureless tape and "HD-20" adhesive, per manufacturer's directions.

D. Dampers

1. Provide butterfly or multi-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.
 - a. Butterfly dampers shall be constructed as per Figure 7-4, Figure A, B, and C in the duct manual.
 - b. Multi-blade dampers shall conform to Figure 7-5.
 - c. Back-draft dampers shall be Air Balance "Air Dynamic" model DY-1002-V, or equal.

2.9 INSULATION

A. Exterior of Ductwork:

1. Unless specified to be lined, all sheet metal supply and return ducts in indirectly conditioned spaces shall be insulated on the outside with Johns Manville "Microlite XG" flexible fiberglass blanket-type duct wrap, with factory applied FSK aluminum foil facing, with a composite UL rating of 25/50, 2" thick, minimum R-6 installed.
2. Unless specified to be lined, all sheet metal supply and return ducts in unconditioned spaces shall be insulated on the outside with Johns Manville "Microlite XG" flexible fiberglass blanket-type duct wrap, with factory applied FSK aluminum foil facing, with a composite UL rating of 25/50, 3" thick, minimum R-8 installed.
3. All outside air ductwork between building outside air inlet and HVAC unit shall be insulated on the outside with Johns Manville "Microlite XG" flexible fiberglass blanket-type duct wrap, with factory applied FSK aluminum foil facing, with a composite UL rating of 25/50, 1-1/2" thick, minimum R-4 installed.
4. Exhaust ductwork within 10 feet of termination point shall be insulated on the outside with Johns Manville "Microlite XG" flexible fiberglass blanket-type duct wrap, with factory applied FSK aluminum foil facing, with a composite UL rating of 25/50, 1-1/2" thick, minimum R-4 installed.

B. Interior of Ductwork:

1. Duct lining shall be installed in supply and return ducts and plenums where noted on the Drawings. Lining shall be Johns Manville "PermacoteLinacoustic R" rigid fiberglass board for plenums and "PermacoteLinacoustic HP" fiberglass duct liner for ducts, 1" thick, unless otherwise noted, with fire resistant coating. Duct liner shall meet ASTM C 1071, with air surface coated with acrylic coating treated with EPA registered anti-microbial agent prove to resist microbial growth as determined by ASTM G 21 and G 22. Insulation with torn or broken coating shall be removed and replaced. Loose corners, edges, and butt joints will not be accepted.
2. All exposed exterior supply and return ductwork shall have minimum 2" interior insulation, as specified in this section.

3. Maximum velocity: 5,000 ft/min.
4. Fasteners: duct liner galvanized steel pins, welded or mechanically fastened.
5. Developed smoke density shall not exceed 50. Flame spread rating shall not exceed 25.

2.10 REGISTERS, GRILLES, AND DIFFUSERS

- A. Air terminals shall be Titus, equivalent Nailor, or approved equal, as scheduled on the Drawings.
- B. All terminals shall be steel and shall be factory painted "off-white," unless otherwise noted. Air terminals for installation in gypsum board shall have a 1" border for surface mounting.

2.11 ACCESS PANELS

- A. Where construction is not inherently accessible, provide adequately sized and conveniently located access doors in ceilings, walls, and furring for servicing valves, equipment, etc. Doors shall be delivered to the General Contractor for installation.
- B. Fire Rated: Inryco/Milcor, U.L. listed, "B" label, 1 ½ hour rating. Minimum size shall be 12" x 12". Provide larger sizes where required. Locks shall be flush screwdriver operated.
- C. Drywalled Surfaces: Inryco/Milcor, Style DW, prime coated steel. Minimum size shall be 12" x 12". Provide larger sizes where required. Locks shall be flush screwdriver operated.
- D. Concrete and Tiled Surfaces: Inryco/Milcor, Style M, prime coated steel, except access panels installed in tiled surfaces shall be stain finish stainless steel. Minimum size shall be 12" x 12". Provide larger sizes where required. Locks shall be flush screwdriver operated.
- E. Plastered Surfaces: Inryco/Milcor, Style K, prime coated steel. Minimum size shall be 12" x 12". Provide larger sizes where required. Locks shall be flush screwdriver operated.

PART 3 – EXECUTION

3.1 INSTALLATION, GENERAL

- A. Provide all necessary cutting in connection with the work of the Section. No cutting shall be done without the approval of the Architect. Comply with requirements specified in Cutting and Patching Section.
- B. No structural members shall be drilled, bored, or notched in a manner that will impair their structural capacity.
- C. All penetrations of concrete or masonry shall be made with core drills.

3.2 EQUIPMENT STARTUP

- A. Notify the Owner's representative a minimum of two weeks prior to equipment startup date to allow for Owner's personnel to be present during startup.
- B. Manufacturer must provide a service technician to supervise rigging of the units to ensure proper fit.

- C. Unit must be checked out, tested and placed into operation by the installing contractor under the supervision of an authorized representative of the factory.
- D. Controls contractor must be present during startup to ensure that factory-installed controls have been adequately installed, wired, and integrated into the building managements system.
- E. Provide minimum eight (8) hours of training time with Owner's maintenance personnel to thoroughly review new equipment, maintenance requirements, and equipment controls.
- F. During startup, the full functionality of the equipment shall be demonstrated to the satisfaction of the Owner's representative, including heating, mechanical cooling, economizer cooling, zone modulation, and all emergency shutdown features.

3.3 EQUIPMENT, GENERAL REQUIREMENTS

- 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. Thoroughly lubricate equipment before operating. Repair of damage resulting from failure to comply with this requirement shall be the Contractor's responsibility.
- D. 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 reinstalled at no expense to the Owner.
- E. Move equipment into building through available openings. Dismantle equipment where necessary to accomplish this. After reassembly, test equipment to verify its satisfactory operating condition.

3.4 DUCTWORK

- A. All ductwork shall be installed within spaces provided where possible. Ducts shall be installed true to line and grade, fully secured to structural faming with specified hangers and supports, insulated, and vibration isolated, where required.
- B. Each section of supply air ductwork shall be cleaned at the shop, dust and oil free, 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 jointed. When duct sections are jointed, 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.

3.5 CONTROLS

- A. This Contractor shall provide all required control components, including but not limited to thermostats, temperature sensors, static pressure sensors, humidity sensors, damper

actuators, valve actuators, unitary controllers, relays, and low-voltage wiring, such that the Owner is provided with a fully functional control system.

- B. Where work is performed in an existing building, this Contractor shall integrate all control modifications into the existing building control system, if applicable. Specific requirements shall be coordinated with Owner and approved by Architect prior to installation.
- C. Installation of the system shall be made under the supervision of the manufacturer of the equipment, or his factory authorized representative.
- D. In addition to the submittals required above, and those set forth in "Submittals," the following items shall be furnished.
 - 1. In an existing building, this Contractor shall furnish a document that describes the proposed materials methods for integration into the existing building management system, if applicable.
 - 2. 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.

3.6 INSULATION

A. Exterior Ductwork:

- 1. The insulation shall be cut longer than the perimeter of the duct to provide 2" staple lap and 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. 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 until the fabric is filled. Mastics shall be applied in accordance with application instructions on the container.

B. Interior Duct Liner

- 1. Apply to the inside face of ducts, coated side facing air stream, fasten using fire retardant adhesive meeting ASTM C 9169, and secure with mechanical liner fasteners at 24" maximum o.c., both directions. Pin length should be such as to limit compression of liner.
- 2. Exposed edges must be factory or field coated. For systems operating at 4000 fpm or higher, a metal nosing must be installed on all liner leading edges. Insulation with torn or broken coatings shall be removed or replaced. Loose corners, edges, and butt joints will not be accepted.

3.7 REFRIGERANT PIPING

- A. Piping shall be continuously purged with dry nitrogen while soldering. Care shall be taken when soldering near valves or other equipment that may be damaged by extreme heat.
- B. Refrigerant piping shall be tested for leaks under 500 psig pressure using an inert gas such as dry nitrogen. Joints shall be tested for leaks using soapsuds. (WARNING! OXYGEN OR

ACETYLENE SHALL NOT BE USED IN PLACE OF DRY NITROGEN. A VIOLENT EXPLOSION MAY RESULT!). Be sure that all controls, relief valves, or rupture discs that could be damaged by test pressure are removed before beginning pressure test.

- C. Pressure and leak tests on refrigerant piping and equipment shall be done in accordance with local code requirements and the American Standard Safety Code for Mechanical Refrigeration (ASA B9.1).
- D. Pressure Testing Requirements:
 - 1. A three-step pressure test shall be performed per the following:
 - a. Step 1 – Leak check at 149 psi for a minimum of 3 minutes.
 - b. Step 2- Leak check at 312 psi for a minimum of 5 minutes.
 - c. Step 3 – Leak check at 550 psi for a minimum of 24 hours.
- E. Evacuation Requirements:
 - 1. The contractor shall notify the Architect 48 hours prior to the time and date of the evacuation.
 - 2. A vacuum pump specifically designed for use with R-410A shall be used to triple-evacuate the system per the following procedure:
 - a. Step 1 – Evacuate the system to 29" mercury and maintain for 20 minutes.
 - b. Step 2 – Break vacuum with dry nitrogen to a pressure of 2-3 psi and maintain for 15 minutes.
 - c. Step 3 – Evacuate the system to 29" mercury and maintain for 20 minutes.
 - d. Step 4 – Break vacuum with dry nitrogen to a pressure of 2-3 psi and maintain for 15 minutes.
 - e. Step 5 - Evacuate the system to 29" mercury and maintain for 20 minutes.
- F. The refrigerant charge shall be calculated and weighed into the system.
- G. After charging with refrigerant, all joints shall be tested with an electric halide leak detector. Precautions should be taken to keep moisture out of the system, and a drier shall be used.
- H. Service technicians shall be certified in the use of CFC and HCFC refrigerant recovery and recycling equipment and he/she shall use UL listed and labeled recovery equipment when discharging refrigerant.

3.8 TEST, INSPECTIONS

- A. Make all necessary control adjustments and balancing of air and water flows. Operate the entire system for a period of time not less than three (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 is obtained.
- B. This 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.

3.9 CLEANUP

SECTION 23 00 00
HVAC

- 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

PART 1 GENERAL

1.1 SCOPE

- A. 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.

1.2 GENERAL

- A. Mechanical Contractor will employ a Testing, Adjusting, and Balancing (TAB) Agency that is certified by Associated Air Balancing Council (AABC), National Environmental Balancing Bureau (NEBB), or Testing, Adjusting, and Balancing Bureau (TABB).
- B. The TAB 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, and the flows of water through all coils.
- C. Existing equipment, unless specifically mentioned otherwise, shall not in the scope of the TAB work.
- D. A completely operable system shall be placed into operation each day during testing and balancing.
- E. The TAB Agency shall utilize instrumentation which meets the requirements of ASHRAE 111, Section 5, "Instrumentation".
- F. 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 TAB Agency by the Mechanical Contractor.
- G. The Mechanical Contractor shall be responsible for making all modifications to recertify discrepancies reported by the TAB 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.
- H. If construction deficiencies are encountered which preclude obtaining optimum conditions, the deficiencies will be recorded and given to the Owner's representative. The TAB Agency is advised that deficiencies in the HVAC construction are often encountered during final TAB services, and should include in the bid an amount deemed advisable to compensate for time in identifying the deficiencies.

1.3 SERVICES

- A. The TAB Agency will 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 TAB Agency is advised that deficiencies in the HVAC construction are often encountered during final TAB services, and should include in the bid an amount deemed advisable to compensate for time in identifying the deficiencies.

- B. The report shall be complete with logs, data, and records as required herein and all logs, data, and records shall be typed, produced, on white bond paper, and bound. Transmit four copies directly to the Owner's Representative to be distributed to the Mechanical Contractor, Controls Contractor, Engineer, and record file.
- C. The report shall contain the following general data in a format selected by the TAB Agency for clarity and ease of reference.
 - 1. Project Title.
 - 2. Project Location.
 - 3. Project Architect (Firm name and address).
 - 4. Project Mechanical Engineer (Name).
 - 5. TAB Field Test Engineer (Name).
 - 6. TAB Agency (Firm name and address).
 - 7. Inclusive dates tests were performed and date of report.
 - 8. Calibration Certificates of each instrument used along with specific ID numbers (i.e., serial numbers).

1.4 SUBMITTALS

- A. Submittal No. 15950 (1) – TAB Agenda
 - 1. The TAB Contractor shall submit a complete agenda, which shall outline in full the testing methods and locations for each HVAC system and/or device that is within the scope of the TAB work. The agenda shall represent the total system balance report, less field test data. Areas of intended field test inputs shall be represented by fully labeled blank spaces.
 - 2. The TAB Agenda shall also indicate the proposed test methods, instrumentation devices and all applicable calibration certificates.
- B. Submittal No 15950 (2) – TAB Report
 - 1. Provide Test and Balance Report as indicated herein.

1.5 AIR SYSTEMS REQUIREMENTS

- A. In addition to the above data in its appropriate format, the Test and Balance Report shall include the following data:
 - 1. Furnaces
 - a. Manufacturer and model.
 - b. Size.
 - c. Motor hp, voltage, phase, cycles, full load amps.
 - d. Location and local identification data.
 - e. Identification tag listed in schedules on drawings and specifications.
 - f. Supply airflow (cfm) and exhaust airflow (cfm), where applicable.
 - g. Supply airflow (cfm) at each fan speed setting. See controls sequence.
 - h. Fan RPM.
 - i. Motor current readings at each fan.
 - j. Inlet and outlet static pressure from supply fan and exhaust fan (if applicable). These readings shall be related to the fan curve.
 - k. Static pressure differential across each coil and filter section.
 - l. Entering air and leaving air temperatures (DB/WB) in 100% cooling mode.

- m. Entering air and leaving air temperatures (DB) in 100% heating mode.
 - n. Outdoor air percentage setting.
 - o. Outdoor airflow in economizer mode.
 - p. Outdoor airflow in demand control ventilation mode (if applicable).
2. Exhaust Fans
- a. Manufacturer and model.
 - b. Size.
 - c. Motor hp, voltage, phase, cycles, full load amps.
 - d. Location and local identification data.
 - e. Identification tag listed in schedules on drawings and specifications.
 - f. Exhaust airflow (cfm).
 - g. Fan RPM.
 - h. Motor current readings at each fan.
3. Heat Recovery Ventilators
- a. Manufacturer and model.
 - b. Size.
 - c. Motor hp, voltage, phase, cycles, full load amps.
 - d. Location and local identification data.
 - e. Identification tag listed in schedules on drawings and specifications.
 - f. Exhaust airflow (cfm).
 - g. OA Airflow (cfm)
 - h. Fan RPM.
 - i. Motor current readings at each fan.

PART 2 – PRODUCTS (not used)

PART 3 – EXECUTION

3.1 GENERAL PROCEDURES

- A. During the balancing, the temperature regulation shall be adjusted for proper relationship between controlling instruments and calibrated. The correctness of the final setting shall be proved by taking hourly readings for a period of one successive 8-hour day, in a typical room on each separately controlled zone, after tenant moves in. The total variation shall not exceed 2 degrees from the preset medium temperature during the temperature survey period. (This will be done only on systems that are totally operational).

3.2 AIR SYSTEMS PROCEDURES

- A. The TAB Agency shall perform the following tests and balance the air systems in accordance with the following requirements:
 - 1. Test and adjust blower and motor rpm to design requirements.
 - 2. Test and record motor full load amperes and corresponding voltage.
 - 3. Make pitot tube traverse of main supply ducts and obtain design cfm at fans.
 - 4. Test and record system static pressures, suction and discharge.
 - 5. Test and adjust system for design cfm of outside air.

6. Test and record entering and leaving air dry bulb temperatures of all heating and cooling coils.
7. Test and record entering and leaving wet bulb temperatures of all cooling coils.
8. Adjust all main supply and return air ducts to proper design cfm. System supply airflow, system return airflow, and system outdoor airflow shall be balanced to within 5% of the design requirement.
9. Adjust all zones to proper design cfm, supply and return.
10. Test and adjust each diffuser, grille, and register to within 10% of design requirement.
11. Each grille, diffuser, and register shall be identified as to location and area.
12. Size, type, and manufacturer of diffusers, grilles, registers, and all tested equipment shall be identified and listed. Manufacturer's ratings on all equipment shall be used to make required calculations.
13. Readings and test of diffusers, grilles, and registers shall include required fpm velocity and test resultant velocity, required cfm and test resultant cfm after adjustments.
14. TAB Agency shall check all controls to ensure they are operating as specified. Provide the control contractor with specific set points.

3.3 TEMPERATURE CONTROL SYSTEM

- A. In the progress of performing the TAB work, the TAB Agency shall:
 1. Work with the Controls Contractor to ensure the most effective total system operation within the design limitations, and to obtain mutual understanding of intended control performance.
 2. Verify that all control devices are properly connected.
 3. Verify that all dampers, valves, and other controlled devices are operated by the intended controller.
 4. Verify that all dampers and valves are in the position indicated by the controller (open, closed, or modulating).
 5. Verify that the integrity of valves and dampers in terms of tightness of close-off and full-open position. This includes dampers in multi-zone units.
 6. Check that all valves are properly installed in the piping system in relation to direction of flow and location.
 7. Verify the calibration of all controllers.
 8. Verify the proper application of all normally open and normally closed valves.
 9. Check the locations of all thermostats and humidistats for potential erratic operation from outside influences such as sunlight, drafts, or cold walls.

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10. Check the locations of all sensors to determine whether their position will allow them to sense only the intended temperatures or pressures of the media. Controls Contractor will relocate as deemed necessary by the TAB Agency.
11. 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.
12. Verify that all controller set points meet the design intent.
13. Check all dampers for free travel.
14. Verify the operation of all interlock systems.
15. Perform all system verification to assure the safety of the system and its components.

B. A systematic check of the above requirements shall be included in the final TAB report.

3.4 TEST AND BALANCE REPORT

A. The report shall contain the following data:

1. A listing of the measured air quantities at each outlet corresponding to the temperature tabulation specified above.
2. Air quantities at each return and exhaust air handling device (only if ducted return systems).
3. Static pressure readings entering and leaving each supply, return and exhaust fan, filter, and coil of the system. These readings shall be related to fan curves in terms of cfm handled.
4. Water pressure readings at gauge connections. Pressure readings at coils and pumps shall be related to coils and pump curves in terms of gpm handled.
5. Motor current readings at each fan and pump. The voltages at the time of the readings shall be listed.

3.5 FINAL ACCEPTANCE

- A. At the time of final inspection, the Balancing Agency shall recheck, in the presence of the Owner's Representative, specific and random selections of data, i.e., water 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.

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- E. If random tests elicit a measured flow deviation of 10% or more from that recorded in the Certified Report on 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, splitter, dampers, and other adjustment devices shall be permanently marked by the TAB 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 26 05 19
LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS
AND CABLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Copper building wire rated 600 V or less.
2. Metal-clad cable, Type MC, rated 600 V or less.
3. Connectors, splices, and terminations rated 600 V and less.

1.3 ACTION SUBMITTALS

- A. Submittal No. 26 05 19 A - Product Data: For each type of product.

- 1.4 Electrical Connection: It is assumed that all connections in the field shall have minimum rated 75°C rated terminals. The contractor shall field verify all terminals for connection in compliance with CEC 110.14. The contractor shall inform the Engineer of Record of any terminals deviating from 75°C.

1. All conductors are rated for 75°C on plans unless otherwise noted.

PART 2 - PRODUCTS

2.1 COPPER BUILDING WIRE

- A. Description: Flexible, insulated and uninsulated, drawn copper current-carrying conductor with an overall insulation layer or jacket, or both, rated 600 V or less. All copper wire shall have a temperature rating of 75°C based on CEC Table 310.15(B)(16) unless otherwise noted on plans.

- B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Cerro Wire LLC.
2. General Cable Technologies Corporation.
3. Southwire Company

- C. Standards:

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.

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LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS
AND CABLES

- 2. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."
 - D. Conductors: Copper, complying with ASTM B3 for bare annealed copper and with ASTM B8 or ASTM B496 for stranded conductors.
 - E. Conductor Insulation:
 - 1. Type NM: Comply with UL 83 and UL 719.
 - 2. Type THHN and Type THWN-2: Comply with UL 83.
 - 3. Type XHHW-2: Comply with UL 44.
- 2.2 METAL-CLAD CABLE, TYPE MC (non-Hospital Grade)
- A. Description: A factory assembly of one or more current-carrying insulated conductors in an overall metallic sheath.
 - B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1. General Cable Technologies Corporation.
 - 2. Southwire Company.
 - C. Standards:
 - 1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
 - 2. Comply with UL 1569.
 - 3. RoHS compliant.
 - 4. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."
 - D. Ground Conductor: Insulated.
 - E. Conductor Insulation:
 - 1. Type TFN/THHN/THWN-2: Comply with UL 83.
 - 2. Type XHHW-2: Comply with UL 44.
 - F. Armor: Steel, interlocked.
 - G. Jacket: PVC applied over armor.

2.3 CONNECTORS AND SPLICES

- A. Description: Factory-fabricated connectors, splices, and lugs of size, ampacity rating, material, type, and class for application and service indicated; listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
- B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

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1. 3M Electrical Products.
 2. AFC Cable Systems; a part of Atkore International.
 3. Hubbell Power Systems, Inc.
 4. Ideal Industries, Inc.
 5. ILSCO.
 6. NSi Industries LLC.
 7. Thomas & Betts Corporation; A Member of the ABB Group.
- C. Jacketed Cable Connectors: For steel and aluminum jacketed cables, zinc die-cast with set screws, designed to connect conductors specified in this Section.
- D. Lugs: One piece, seamless, designed to terminate conductors specified in this Section.
1. Material: Copper.
 2. Type: One or two-hole with standard or long barrels.
 3. Termination: Compression.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

- A. Branch Circuits and Feeders: Copper; solid for No. 12 AWG and smaller; stranded for No. 10 AWG and larger.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- A. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspace: Type THHN/THWN-2, single conductors in raceway.
- B. Exposed Branch Circuits, Including in Crawlspace: Type THHN/THWN-2, single conductors in raceway.
- C. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN/THWN-2, single conductors in raceway Metal-clad cable, Type MC.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.
- B. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- C. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- D. Install exposed cables parallel and perpendicular to surfaces of exposed structural members and follow surface contours where possible.

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AND CABLES

- E. Wiring within Enclosures: Separate power-limited and non-power-limited conductors as recommended by manufacturer. Install conductors parallel with or at right angles to sides and back of the enclosure. Bundle, lace, and train conductors to terminal points with no excess. Connect conductors that are terminated, spliced, or interrupted in any enclosure associated with fire-alarm system to terminal blocks. Mark each terminal according to system's wiring diagrams. Make all connections with approved crimp-on terminal spade lugs, pressure-type terminal blocks, or plug connectors.
- F. Cable Taps: Use numbered terminal strips in junction, pull, and outlet boxes; cabinets; or equipment enclosures where circuit connections are made.
- G. Color-Coding: Color-code Division 27 and Division 28 conductors differently from the normal building power wiring.

3.4 CONNECTIONS

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.
- B. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
 - 1. Use oxide inhibitor in each splice, termination, and tap for aluminum conductors.
- C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches of slack.

3.5 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies.

3.6 FIRESTOPPING

- A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly.

3.7 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Perform tests and inspections:
 - 1. After installing conductors and cables and before electrical circuitry has been energized, test service entrance and feeder conductors for compliance with requirements.
 - 2. After installing conductors and cables and before electrical circuitry has been energized, test service entrance and feeder conductors and all conductors #6 AWG and larger.
 - a. The cabling system shall be certified (inspected, tested and documented) that it is ready for operation.
 - 1) Insulation resistance test:

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- a) Perform insulation resistance test on each conductor #6 AWG and larger with respect to ground. Applied potential to be 1,000 VDC for one minute.
 - b) Record test values and submit to the Engineer. Insulation resistance to be 50 megohm, minimum.
 - c) Measure insulation resistance of complete circuits with the breakers open.
- b. Forms: Example ORT forms are provided in the supplement at the end of this section.

END OF SECTION

**SECTION 26 05 19
LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS
AND CABLES**

SUPPLEMENT NO. 1

**EXAMPLE
ORT FORMS**

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes grounding and bonding systems and equipment.
- B. Section includes grounding and bonding systems and equipment, plus the following special applications:
 - 1. Underground distribution grounding.

1.2 ACTION SUBMITTALS

- A. Submittal No. 26 05 26 A - Product Data: For each type of product indicated.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with UL 467 for grounding and bonding materials and equipment.

2.2 CONDUCTORS

- A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
- B. Grounding Bus Bar TMGB: Predrilled rectangular bars of annealed copper, length as required, in cross section, with 9/32-inch holes spaced 1-1/8 inches apart. Stand-off insulators for mounting shall comply with UL 891 for use in switchboards, 600 V and shall be Lexan or PVC, impulse tested at 5000 V.

2.3 CONNECTORS

- A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.
- B. Bus-Bar Connectors: Mechanical type, cast silicon bronze, solderless compression-type wire terminals, and long-barrel, two-bolt connection to ground bus bar.
- C. Bus-Bar Connectors: Compression type, copper or copper alloy, with two wire terminals.

- D. Cable-to-Cable Connectors: Compression type, copper or copper alloy.
- E. Conduit Hubs: Mechanical type, terminal with threaded hub.

PART 3 - EXECUTION

3.1 APPLICATIONS

- A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.
- B. Grounding Conductors: Green-colored insulation with continuous yellow stripe.
- C. Grounding Bus: Install in electrical equipment rooms, in rooms housing service equipment, and elsewhere as indicated.
 - 1. Install bus horizontally, on insulated spacers 2 inches minimum from wall, 6 inches above finished floor unless otherwise indicated.

3.2 GROUNDING AT THE SERVICE

- A. Equipment grounding conductors and grounding electrode conductors shall be connected to the ground bus. Install a main bonding jumper between the neutral and ground buses.

3.3 EQUIPMENT GROUNDING

- A. Install insulated equipment grounding conductors with all feeders and branch circuits.
- B. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:
 - 1. Feeders and branch circuits.
 - 2. Lighting circuits.
 - 3. Receptacle circuits.
 - 4. Single-phase motor and appliance branch circuits.
 - 5. Three-phase motor and appliance branch circuits.
- C. Air-Duct Equipment Circuits: Install insulated equipment grounding conductor to duct-mounted electrical devices operating at 120 V and more, including air cleaners, heaters, dampers, humidifiers, and other duct electrical equipment. Bond conductor to each unit and to air duct and connected metallic piping.

3.4 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

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FOR ELECTRICAL SYSTEMS**

- B. Connections: Make connections so possibility of galvanic action or electrolysis is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact are galvanically compatible.
 - 1. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer in order of galvanic series.
 - 2. Make connections with clean, bare metal at points of contact.
 - 3. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.
 - 4. Make aluminum-to-galvanized-steel connections with tin-plated copper jumpers and mechanical clamps.
 - 5. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.

3.5 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Tests and Inspections:
 - 1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
 - 2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Steel slotted support systems.
 - 2. Conduit and cable support devices.
 - 3. Structural steel for fabricated supports and restraints.
 - 4. Mounting, anchoring, and attachment components, including powder-actuated fasteners, mechanical expansion anchors, concrete inserts, clamps, through bolts, toggle bolts, and hanger rods.
 - 5. Rooftop support system.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Hangers and supports shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
 - 1. The term "withstand" means "the supported equipment and systems will remain in place without separation of any parts when subjected to the seismic forces specified."

2.2 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

- A. Steel Slotted Support Systems: Preformed steel channels and angles with minimum 13/32-inch-diameter holes at a maximum of 8 inches o.c. in at least one surface.
 - 1. Standard: Comply with MFMA-4 factory-fabricated components for field assembly.
 - 2. Material for Channel, Fittings, and Accessories: Stainless steel, Type 304 Stainless steel.
 - 3. Channel Width: Selected for applicable load criteria.
 - 4. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
 - 5. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
 - 6. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

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FOR ELECTRICAL SYSTEMS**

- B. Conduit and Cable Support Devices: Steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- C. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for nonarmored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be made of malleable iron.
- D. Structural Steel for Fabricated Supports and Restraints: ASTM A36/A36M steel plates, shapes, and bars; black and galvanized.
- E. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
 - 1. Clamps for Attachment to Steel Structural Elements: MSS SP-58 units are suitable for attached structural element.
 - 2. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM F3125/F3125M, Grade A325.
 - 3. Toggle Bolts: Stainless-steel springhead type.
 - 4. Hanger Rods: Threaded steel.

2.3 ROOFTOP SUPPORT SYSTEM

- A. Description: Rubber / steel pipe support for support of conduit systems.
- B. Materials: Curb base shall be made of rubber and polyurethane prepolymer with a uniform load capacity of 500 pounds per linear foot of support. Steel frame, strut galvanized per ASTM A653 or strut galvanized per ASTM A653 for bridge series.
- C. Dimensions: 6" wide by 5" tall by 9 ½" or 20" long as required.
- D. Attaching hardware: Zinc-plated threaded rod, nuts and attaching hardware per ASTM B633.
- E. Type of rooftop supports:
 - 1. Rubber block supports Accessories are fastened directly into rubber material with weather resistant type 12 lag screws.
 - 2. Continuous block channel supports. Standard strut accessories can be used for attachment.
 - 3. Bridge channel supports. Standard strut accessories used for attachment.
 - 4. Extendible height support where required, height to suit application: 8-inch, 12-inch or 16-inch (200 pound maximum load).

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HANGERS AND SUPPORTS
FOR ELECTRICAL SYSTEMS**

PART 3 - EXECUTION

3.1 APPLICATION

- A. Comply with the following standards for application and installation requirements of hangers and supports, except where requirements on Drawings or in this Section are stricter:
 - 1. NECA 1.
 - 2. NECA 101
 - 3. NECA 102.
 - 4. NECA 105.
 - 5. NECA 111.
- B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceways: Space supports for EMT, IMC, and RMC as required by NFPA 70. Minimum rod size shall be 1/4 inch in diameter.
- C. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted or other support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
 - 1. Secure raceways and cables to these supports with two-bolt conduit clamps.
- D. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch and smaller raceways serving branch circuits and communication systems above suspended ceilings, and for fastening raceways to trapeze supports.

3.2 SUPPORT INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this article.
- B. Raceway Support Methods: In addition to methods described in NECA 1, EMT IMC and RMC may be supported by openings through structure members, according to NFPA 70.
- C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.
- D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
 - 1. To Wood: Fasten with lag screws or through bolts.
 - 2. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate by means that comply with seismic-restraint strength and anchorage requirements.

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3.3 CONCRETE BASES

- A. Construct concrete bases of dimensions indicated, but not less than 4 inches larger in both directions than supported unit, and so anchors will be a minimum of 10 bolt diameters from edge of the base.
- B. Use 3000-psi, 28-day compressive-strength concrete. Concrete materials, reinforcement, and placement requirements are specified in specification Division 3. Reference Electrical, Structural and Architectural plan sheets.
- C. Anchor equipment to concrete base as follows:
 - 1. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 2. Install anchor bolts to elevations required for proper attachment to supported equipment.
 - 3. Install anchor bolts according to anchor-bolt manufacturer's written instructions.

3.4 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
 - 1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.
- B. Touchup: Comply with requirements in Specification Division 09 and Architectural plan sheets for cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal.
- C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A780.

3.5 ROOFTOP SUPPORTS:

- A. Install in accordance with manufacturer's instructions, recommendations and in accordance with CEC requirements.
- B. If gravel top roof, gravel must be removed around and under pipe support.
- C. Always consult roofing manufacturer for roof membrane compression capacities. If necessary, a compatible sheet of roofing material (rubber pad) may be installed under rooftop support to disperse concentrated loads and add further membrane protection.
- D. Use properly sized clamps to suit conduit sizes.

END OF SECTION

**SECTION 26 05 33
RACEWAYS AND BOXES
FOR ELECTRICAL SYSTEMS**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Metal conduits and fittings.
 - 2. Nonmetallic conduits and fittings.
 - 3. Surface non-metallic raceways.
 - 4. Boxes, enclosures, and cabinets.

1.3 DEFINITIONS

- A. EMT: Electrical Metallic Tubing.
- B. RNC: Rigid Non-metallic Conduit (Electrical Polyvinyl Chloride Conduit).
- C. FMC: Flexible Metal Conduit.
- D. LFMC: Liquid Tight Flexible Metal Conduit.

1.4 ACTION SUBMITTALS

- A. Product Data: For surface raceways and wireways, provide all intended components (fittings, coupings, connectors, boxes, faceplates, mounting clips, etc.) for construction. For fittings, hinged-cover enclosures, and cabinets.

PART 2 - PRODUCTS

2.1 METAL CONDUITS AND FITTINGS

- A. Metal Conduit:
 - 1. Listing and Labeling: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
 - a. Comply with NEMA RN 1.
 - b. Coating Thickness: 0.040 inch, minimum.

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2. EMT: Comply with ANSI C80.3 and UL 797.
3. FMC: Comply with UL 1; zinc-coated steel.
4. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.

B. Metal Fittings:

1. Comply with NEMA FB 1 and UL 514B.
2. Listing and Labeling: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
3. Fittings, General: Listed and labeled for type of conduit, location, and use.
4. Fittings for EMT:
 - a. Material: Steel.
 - b. Type: Setscrew or compression.
5. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.
6. Coating for Fittings for PVC-Coated Conduit: Minimum thickness of 0.040 inch, with overlapping sleeves protecting threaded joints.
7. Throats: Insulated

2.2 NONMETALLIC CONDUITS AND FITTINGS

A. Nonmetallic Conduit:

1. Listing and Labeling: Nonmetallic conduit shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. Fiberglass:
 - a. Comply with NEMA TC 14.
 - b. Comply with UL 2515 for aboveground raceways.
 - c. Comply with UL 2420 for belowground raceways.
3. ENT: Comply with NEMA TC 13 and UL 1653.
4. RNC: Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.

B. Nonmetallic Fittings:

1. Fittings, General: Listed and labeled for type of conduit, location, and use.
2. Fittings for ENT and RNC: Comply with NEMA TC 3; match to conduit or tubing type and material.
3. Solvents and Adhesives: As recommended by conduit manufacturer.

2.3 SURFACE RACEWAYS

- A. Listing and Labeling: Surface raceways shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

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- B. Surface non-metallic Raceways: Non-metallic, with ivory finish, accommodates communications, computer lines, fire alarm or power; snap lock cover, device boxes per application.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Legrand Wiremold.
 - 1) Acceptable models may include 400 & 800 series with components matching a single manufacturer's system.

2.4 BOXES, ENCLOSURES, AND CABINETS

- A. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.
- B. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.
- C. Nonmetallic Outlet and Device Boxes: Comply with NEMA OS 2 and UL 514C.
- D. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
- E. Box extensions used to accommodate new building finishes shall be of same material as recessed box.
- F. Device Box Dimensions: 4 inches square by 2-1/8 inches deep unless otherwise noted on Drawings.
- G. Cabinets:
 - 1. NEMA 250, Type 1 or Type 3R (per application) galvanized-steel box with removable front, finished inside and out with manufacturer's standard enamel.
 - 2. Hinged door in front cover with flush latch and concealed hinge.
 - 3. Screw cover assembly.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

- A. Outdoors: Apply raceway products as specified below unless otherwise indicated:
 - 1. Concealed Conduit, Aboveground: EMT.
 - 2. Underground Conduit: RNC, Type EPC-40-PVC,.
 - 3. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
 - 4. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.
- B. Indoors: Apply raceway products as specified below unless otherwise indicated:

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1. Exposed: EMT.
2. Concealed in Ceilings and Interior Walls and Partitions: EMT.
3. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
4. Damp or Wet Locations not subject to physical damage: GRC.
5. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4 stainless steel in institutional and commercial kitchens and damp or wet locations.

C. Minimum Raceway Size: 3/4-inch trade size.

D. Raceway Fittings: Compatible with raceways and suitable for use and location.

1. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with this type of conduit. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.
2. EMT: Use setscrew or compression, steel fittings. Comply with NEMA FB 2.10.
3. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.

3.2 INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter.
- B. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- C. Complete raceway installation before starting conductor installation.
- D. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches of changes in direction.
- E. Make bends in raceway using large-radius preformed ells. Field bending shall be according to NFPA 70 minimum radii requirements. Use only equipment specifically designed for material and size involved.
- F. Conceal conduit within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.
- G. Support conduit within 12 inches of enclosures to which attached.
- H. Coat field-cut threads on PVC-coated raceway with a corrosion-preventing conductive compound prior to assembly.
- I. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.
- J. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.

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- K. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.
- L. Cut conduit perpendicular to the length. For conduits 2-inch trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.
- M. Surface Raceways:
1. Install surface raceway with a minimum 2-inch radius control at bend points.
 2. Secure surface raceway with screws or other anchor-type devices at intervals not exceeding 48 inches and with no less than two supports per straight raceway section. Support surface raceway according to manufacturer's written instructions. Tape and glue are not acceptable support methods.
 3. Mount surface raceways in the corners of ceilings, keeping the raceways tight to the wall.
 4. Modify raceways as necessary for transition in ceiling heights.
 5. When crossing hallways or rooms, align raceway edge with ceiling tile separations, installing the raceway in 90 degree increments.
 6. Before installing raceway, coordinate all routing with the Architect and Redding School District staff.
 7. For the gymnasium, the district is furring out all walls. There shall be no exposed cabling or raceways in the gymnasium proper. Surface mounted raceways may be used in rooms outside of the gym where shown on plans.
 8. See plans for areas where surface mounted raceways are allowed. All other locations shall be entirely hidden unless otherwise allowed by Redding School District, the Architect or EEOR.
- N. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings according to NFPA 70.
- O. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:
1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
 2. Where an underground service raceway enters a building or structure.
 3. Conduit extending from interior to exterior of building.
 4. Conduit extending into pressurized duct and equipment.
 5. Conduit extending into pressurized zones that are automatically controlled to maintain different pressure set points.
 6. Where otherwise required by NFPA 70.
- P. Comply with manufacturer's written instructions for solvent welding RNC and fittings.
- Q. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 36 inches of flexible conduit for recessed and semi-recessed luminaires, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
1. Use LFMC in damp or wet locations subject to severe physical damage.
 2. Use LFMC in damp or wet locations not subject to severe physical damage.

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- R. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.
 - S. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block and install box flush with surface of wall. Prepare block surfaces to provide a flat surface for a raintight connection between box and cover plate or supported equipment and box.
 - T. Horizontally separate boxes mounted on opposite sides of walls, so they are not in the same vertical channel.
 - U. Locate boxes so that cover or plate will not span different building finishes.
 - V. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.
 - W. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.
 - X. Set metal floor boxes level and flush with finished floor surface.
 - Y. Set nonmetallic floor boxes level. Trim after installation to fit flush with finished floor surface.
- 3.3 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS
- A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies.
- 3.4 FIRESTOPPING
- A. Install firestopping at penetrations of fire-rated floor and wall assemblies.
- 3.5 PROTECTION
- A. Protect coatings, finishes, and cabinets from damage and deterioration.
 - 1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
 - 2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION 260533

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Labels.
 - 2. Tape.
 - 3. Cable ties.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Comply with NFPA 70.
- B. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.
- C. Comply with ANSI Z535.4 for safety signs and labels.
- D. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.
- E. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

2.2 COLOR AND LEGEND REQUIREMENTS

- A. Single-sided Equipment Identification labels:
 - 1. White letters on a black field.
 - 2. Panelboards, switchgear, disconnects and transformer nameplates shall follow the examples below:

PANEL A
FED FROM MSB
400A, 277/480, 3Ø, 22kAIC

XFMR B
FED FROM PANEL A
480:120/208V, 3Ø, 75kVA

- B. Color-Coding for Phase- Identification, 600 V or Less: Use colors listed below for ungrounded feeder and branch-circuit conductors.
 - 1. Color shall be factory applied or field applied for sizes larger than No. 8 AWG if authorities having jurisdiction permit.

SECTION 26 05 53
IDENTIFICATION FOR ELECTRICAL SYSTEMS

2. Colors for 208/120-V Circuits:
 - a. Phase A: Black.
 - b. Phase B: Red.
 - c. Phase C: Blue.
3. Color for Neutral: White or gray.
4. Color for Equipment Grounds: Bare copper Green.
5. Colors for Isolated Grounds: Green with two or more yellow stripes.

2.3 TAPE:

A. Underground-Line Warning Tape:

1. Tape:
 - a. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical and communications utility lines.
 - b. Printing on tape shall be permanent and shall not be damaged by burial operations.
 - c. Tape material and ink shall be chemically inert and not subject to degradation when exposed to acids, alkalis, and other destructive substances commonly found in soils.

2.4 CABLE TIES

A. General-Purpose Cable Ties: Fungus inert, self-extinguishing, one piece, self-locking, and Type 6/6 nylon.

1. Minimum Width: 3/16 inch.
2. Tensile Strength at 73 Deg F according to ASTM D638: 12,000 psi.
3. Temperature Range: Minus 40 to plus 185 deg F.
4. Color: Black, except where used for color-coding.

B. UV-Stabilized Cable Ties: Fungus inert, designed for continuous exposure to exterior sunlight, self-extinguishing, one piece, self-locking, and Type 6/6 nylon.

1. Minimum Width: 3/16 inch.
2. Tensile Strength at 73 Deg F according to ASTM D638: 12,000 psi.
3. Temperature Range: Minus 40 to plus 185 deg F.
4. Color: Black.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Self-Adhesive Identification Products: Before applying electrical identification products, clean substrates of substances that could impair bond, using materials and methods recommended by manufacturer of identification product.

SECTION 26 05 53
IDENTIFICATION FOR ELECTRICAL SYSTEMS

3.2 INSTALLATION

- A. Coordinate identification with Project Drawings.
- B. Elevated Components: Increase sizes of labels, signs, and letters to those appropriate for viewing from the floor.
- C. Underground Line Warning Tape:
 - 1. During backfilling of trenches, install continuous underground-line warning tape directly above cable or raceway at 6 to 8 inches below finished grade. Use multiple tapes where width of multiple lines installed in a common trench or concrete envelope exceeds 16 inches overall.
 - 2. Install underground-line warning tape for direct-buried cables and cables in raceways.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Time switches.

1.3 ACTION SUBMITTALS

- A. Submittal No. 26 09 23 A - Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 TIME SWITCHES

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1. Intermatic, Inc.
- B. Mechanical Time Switches: Comply with UL 917.
 - 1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
 - 2. Contact Rating:
 - a. Normally open, 40 general purpose and resistive.
 - 3. Programs: 4 set points on a 24-hour/7-day schedule.
 - 4. Interface: Mechanical or Electronic.
 - 5. Circuitry: Allows connection of a photoelectric relay as a substitute for the on-off function of a program.
 - 6. Small Case NEMA 1 enclosure.
 - a. Number of circuits: 4.

2.2 OUTDOOR PHOTOELECTRIC SWITCHES

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1. Intermatic, Inc.

SECTION 26 09 23
LIGHTING CONTROL DEVICES

- B. Description: Solid state, with SPST dry contacts rated for 1000 W incandescent or 1800 VA inductive, to operate connected relay, contactor coils, or microprocessor input; complying with UL 773A, and compatible with ballasts and LED lamps.
1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
 2. Time Delay: Fifteen-second minimum, to prevent false operation.
 3. Mounting: Twist lock complies with NEMA C136.10, with base-and-stem mounting or stem-and-swivel mounting accessories as required to direct sensor to the north sky exposure.
 4. Failure Mode: Luminaire stays ON.
 5. LED Rated contacts when used for LED luminaires.

2.3 DIGITAL TIMER LIGHT SWITCH

- A. <Double click here to find, evaluate, and insert list of manufacturers and products.>
- B. Description: Combination digital timer and conventional switch lighting control unit. Switchbox-mounted, backlit LCD display, with selectable time interval in [**10**] [**20**] minute increments.
1. Rated 960 W at 120-V ac for tungsten lighting, 10 A at 120-V ac or 10 amps at 277-V ac for ballast or LED, and 1/4 horsepower at 120-V ac.
 2. Voltage: Match the circuit voltage or Dual voltage - 120 and 277 V.
 3. Color: White.
 4. Faceplate: Color matched to switch.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine lighting control devices before installation. Reject lighting control devices that are wet, moisture damaged, or mold damaged.
- B. Examine walls and ceilings for suitable conditions where lighting control devices will be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 WIRING INSTALLATION

- A. Comply with NECA 1.
- B. Wiring within Enclosures: Comply with NECA 1. Separate power-limited and nonpower-limited conductors according to conductor manufacturer's written instructions.
- C. Size conductors according to lighting control device manufacturer's written instructions unless otherwise indicated.
- D. Splices, Taps, and Terminations: Make connections only on numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures.

3.3 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
 - 1. Operational Test: After installing time switches and sensors, and after electrical circuitry has been energized, start units to confirm proper unit operation.
 - 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- B. Lighting control devices will be considered defective if they do not pass tests and inspections.

3.4 DEMONSTRATION

- A. Train the Owner's maintenance personnel to adjust, operate, and maintain lighting control devices.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Service and distribution switchboards rated 600 V and less.
2. Disconnecting and overcurrent protective devices.
3. Identification.

1.2 ACTION SUBMITTALS

A. Submittal No. 26 24 13 A - Product Data: For each switchboard, overcurrent protective device, surge protection device, ground-fault protector, accessory, and component.

1. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Deliver switchboards in sections or lengths that can be moved past obstructions in delivery path.**
- B. Remove loose packing and flammable materials from inside switchboards and to prevent condensation.**

1.4 FIELD CONDITIONS

A. Environmental Limitations:

1. Do not deliver or install switchboards until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above switchboards is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
2. Rate equipment for continuous operation under the following conditions unless otherwise indicated:
 - a. Ambient Temperature: Not exceeding 104 deg F.

B. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:

1. Notify Owner no fewer than seven days in advance of proposed interruption of electric service.
2. Indicate method of providing temporary electric service.
3. Do not proceed with interruption of electric service without Owner's permission.
4. Comply with NFPA 70E.

1.5 COORDINATION

- A. Coordinate layout and installation of switchboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, encumbrances to workspace clearance requirements, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.
- B. Coordinate sizes and locations of concrete bases with actual equipment provided. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified with concrete.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Switchboards shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
 - 1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation. Shake-table testing shall comply with ICC-ES AC156.
 - 2. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified."

2.2 SWITCHBOARDS

- A. Source Limitations: Obtain switchboards, overcurrent protective devices, components, and accessories from single source from single manufacturer.
- B. Product Selection for Restricted Space: Drawings indicate maximum dimensions for switchboards including clearances between switchboards and adjacent surfaces and other items. Comply with indicated maximum dimensions.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- D. Comply with NEMA PB 2.
- E. Comply with NFPA 70.
- F. Comply with UL 891.
- G. Front-Connected, Front-Accessible Switchboards:
 - 1. Branch Devices: Panel mounted.
 - 2. Sections front and rear aligned.
- H. Nominal System Voltage: 208/120V, 3Ø.
- I. Indoor Enclosures: Steel, NEMA 250, Type 1.

- J. Enclosure Finish for Indoor Units: Factory-applied finish in manufacturer's standard ANSI 61 gray finish over a rust-inhibiting primer on treated metal surface.
- K. Service Entrance Rating: Switchboards intended for use as service entrance equipment shall contain from one to six service disconnecting means with overcurrent protection, a neutral bus with disconnecting link, a grounding electrode conductor terminal, and a main bonding jumper.
- L. Bus Transition and Incoming Pull Sections: Matched and aligned with basic switchboard.
- M. Buses and Connections: Three phase, four wire unless otherwise indicated.
 - 1. Phase- and Neutral-Bus Material: Hard-drawn copper of 98 percent conductivity.
 - 2. Phase- and Neutral-Bus Material: Tin-plated, high-strength, electrical-grade aluminum alloy with tin-plated aluminum circuit-breaker line connections.
 - 3. Copper feeder circuit-breaker line connections.
 - 4. Tin-plated aluminum feeder circuit-breaker line connections.
 - 5. Load Terminals: Insulated, rigidly braced, runback bus extensions, of same material as through buses, equipped with mechanical connectors for outgoing circuit conductors. Provide load terminals for future circuit-breaker positions at full-ampere rating of circuit-breaker position.
 - 6. Main-Phase Buses and Equipment-Ground Buses: Uniform capacity for entire length of switchboard's main and distribution sections. Provide for future extensions from both ends.
 - 7. Disconnect Links:
 - a. Isolate neutral bus from incoming neutral conductors.
 - b. Bond neutral bus to equipment-ground bus for switchboards utilized as service equipment or separately derived systems.
 - 8. Neutral Buses: 100 percent of the ampacity of phase buses unless otherwise indicated, equipped with mechanical connectors for outgoing circuit neutral cables. Brace bus extensions for busway feeder neutral bus.
 - 9. Isolation Barrier Access Provisions: Permit checking of bus-bolt tightness.
- N. Future Devices: Equip compartments with mounting brackets, supports, bus connections, and appurtenances at full rating of circuit-breaker compartment.
- O. Bus-Bar Insulation: Factory-applied, flame-retardant, tape wrapping of individual bus bars or flame-retardant, spray-applied insulation. Minimum insulation temperature rating of 105 deg C.

2.3 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

- A. Molded-Case Circuit Breaker (MCCB): Comply with UL 489, with interrupting capacity to meet available fault currents.
 - 1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
 - 2. Adjustable Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.
 - 3. Electronic trip circuit breakers with rms sensing; field-replaceable rating plug or field-replicable electronic trip; and the following field-adjustable settings:
 - a. Instantaneous trip.

- b. Long- and short-time pickup levels.
- c. Long- and short-time adjustments.
- d. Ground-fault pickup level, time delay, and I squared t response.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine switchboards before installation. Reject switchboards that are moisture damaged or physically damaged.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 CONNECTIONS

- A. Bond conduits entering underneath the switchboard to the equipment ground bus with a bonding conductor sized per NFPA 70.
- B. Support and secure conductors within the switchboard according to NFPA 70.
- C. Extend insulated equipment grounding cable to busway ground connection and support cable at intervals in vertical run.

3.3 IDENTIFICATION

- A. Device Nameplates: Label each disconnecting, and overcurrent protective device and each meter and control device mounted in compartment doors with a nameplate complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

3.4 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Tests and Inspections:
 - 1. Acceptance Testing:
 - a. Test insulation resistance for each switchboard bus, component, connecting supply, feeder, and control circuit. Open control and metering circuits within the switchboard and remove neutral connection to surge protection and other electronic devices prior to insulation test. Reconnect after test.
 - b. Test continuity of each circuit.
 - 2. Test ground-fault protection of equipment for service equipment per NFPA 70.
 - 3. Correct malfunctioning units on-site where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
 - 4. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.
- C. Switchboard will be considered defective if it does not pass tests and inspections.

3.5 ADJUSTING

- A. Adjust moving parts and operable components to function smoothly and lubricate as recommended by manufacturer.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Distribution panelboards.
 - 2. Lighting and appliance branch-circuit panelboards.

1.3 DEFINITIONS

- A. ATS: Acceptance testing specification.
- B. GFCI: Ground-fault circuit interrupter.
- C. MCCB: Molded-case circuit breaker.

1.4 ACTION SUBMITTALS

- A. Submittal No. 26 24 16 A - Product Data: For each type of panelboard.
 - 1. Include materials, switching and overcurrent protective devices, SPDs, accessories, and components indicated.
 - 2. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: ISO 9001 or 9002 certified.

1.6 FIELD CONDITIONS

- A. Environmental Limitations:
- B. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:
 - 1. Notify Owner no fewer than 7 days in advance of proposed interruption of electric service.
 - 2. Do not proceed with interruption of electric service without Owner's permission.
 - 3. Comply with NFPA 70E.

- C. Existing Equipment that shall remain in the field and not be demolished shall have its feeder traced and feeding equipment identified. Provide and install labels on existing equipment per Part 3, 3.3(B) below.

PART 2 - PRODUCTS

2.1 PANELBOARDS COMMON REQUIREMENTS

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with NEMA PB 1.
- C. Comply with NFPA 70.
- D. Enclosures: As indicated on plans.
 - 1. Rated for environmental conditions at installed location.
 - a. Indoor Dry and Clean Locations: NEMA 250, Type 1.
 - b. Outdoor Locations: NEMA 250, Type 3R.
 - c. Kitchen or Wash down areas: NEMA 250, Type 4X.
 - 2. Front: Secured to box with concealed trim clamps. For surface-mounted fronts, match box dimensions; for flush-mounted fronts, overlap box. Trims shall cover all live parts and shall have no exposed hardware.
 - 3. Hinged Front Cover: Door-in-door hinged trim. Trims shall cover all live parts and shall have no exposed hardware.
 - 4. Finishes:
 - a. Panels and Trim: Steel, factory finished immediately after cleaning and pretreating with manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat.
 - b. Back Boxes: Galvanized steel.
 - c. Fungus Proofing: Permanent fungicidal treatment for overcurrent protective devices and other components.
- E. Phase, Neutral, and Ground Buses:
 - 1. Material: Copper.
 - a. Plating shall run entire length of bus.
 - b. Bus shall be fully rated the entire length.
 - 2. Interiors shall be factory assembled into a unit. Replacing switching and protective devices shall not disturb adjacent units or require removing the main bus connectors.
 - 3. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment grounding conductors; bonded to box.
 - 4. Isolated Ground Bus: Adequate for branch-circuit isolated ground conductors; insulated from box.
 - 5. Full-Sized Neutral: Equipped with full-capacity bonding strap for service entrance applications. Mount electrically isolated from enclosure. Do not mount neutral bus in gutter.

- F. Conductor Connectors: Suitable for use with conductor material and sizes.
 - 1. Material: Tin-plated aluminum.
 - 2. Terminations shall allow use of 75 deg C rated conductors without derating.
 - 3. Size: Lugs suitable for indicated conductor sizes, with additional gutter space, if required, for larger conductors.
 - 4. Main and Neutral Lugs: Mechanical type, with a lug on the neutral bar for each pole in the panelboard.
 - 5. Ground Lugs and Bus-Configured Terminators: Mechanical type, with a lug on the bar for each pole in the panelboard.
- G. Panelboard Short-Circuit Current Rating: Fully rated to interrupt symmetrical short-circuit current available at terminals. Assembly listed by an NRTL for 100 percent interrupting capacity.
 - 1. Panelboards and overcurrent protective devices rated 240 V or less shall have short-circuit ratings as shown on Drawings.

2.2 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Panelboards shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
 - 1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified."

2.3 POWER PANELBOARDS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1. Eaton.
 - 2. Siemens Industry, Inc., Energy Management Division.
 - 3. Square D.
- B. Panelboards: NEMA PB 1, distribution type.
- C. Doors: Hinged door-in-door, secured with vault-type latch with tumbler lock; keyed alike.
- D. Mains: as indicated on plans.
- E. Branch Overcurrent Protective Devices: Bolt-on circuit breakers.
- F. Branch Overcurrent Protective Devices for Circuit-Breaker Frame Sizes Larger Than 125 A: Bolt-on circuit breakers.

2.4 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

- A. MCCB: Comply with UL 489, with interrupting capacity to meet available fault currents.
 - 1. Thermal-Magnetic Circuit Breakers:
 - a. Inverse time-current element for low-level overloads.

- b. Instantaneous magnetic trip element for short circuits.
- c. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify actual conditions with field measurements prior to ordering panelboards to verify that equipment fits in allocated space in, and comply with, minimum required clearances specified in NFPA 70.
- B. Examine panelboards before installation. Reject panelboards that are damaged, rusted, or have been subjected to water saturation.
- C. Examine elements and surfaces to receive panelboards for compliance with installation tolerances and other conditions affecting performance of the Work.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with NECA 1.
- B. The center of the operating handle of switches or circuit breakers used as switches shall not be mounted higher than 79" above the floor or working platform per CEC 404.8.
- C. Mount panelboard cabinet plumb and rigid without distortion of box.
- D. Mount recessed panelboards with fronts uniformly flush with wall finish and mating with back box.
- E. Make grounding connections and bond neutral for services and separately derived systems to ground. Make connections to grounding electrodes, separate grounds for isolated ground bars, and connections to separate ground bars.
- F. Install filler plates in unused spaces.
- G. Stub four 1-inch empty conduits from panelboard into accessible ceiling space or space designated to be ceiling space in the future. Stub four 1-inch empty conduits into raised floor space or below slab not on grade.
- H. Arrange conductors in gutters into groups and bundle and wrap with wire ties.
- I. Mount spare fuse cabinet in accessible location.

3.3 IDENTIFICATION

- A. Create a directory to indicate installed circuit loads; incorporate Owner's final room designations. Obtain approval before installing. Handwritten directories are not acceptable. Install directory inside panelboard door.

- B. Panelboard Nameplates shall follow the example below:

PANEL A2
FED FROM SWBD-1
400A, 120/208V, 3Ø, 22kAIC

3.4 FIELD QUALITY CONTROL

- A. Acceptance Testing Preparation:

1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.
2. Test continuity of each circuit.

3.5 ADJUSTING

- A. Adjust moving parts and operable components to function smoothly and lubricate as recommended by manufacturer.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Specification-grade receptacles, 125 V, 20 A.
 - 2. GFCI receptacles, 125 V, 20 A.
 - 3. Wall plates.

1.3 DEFINITIONS

- A. GFCI: Ground-fault circuit interrupter.
- B. Motor Rated Toggle Switch, 2 or 3 pole, 30A.

1.4 ACTION SUBMITTALS

- A. Submittal No. 26 27 26 A - Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 GENERAL WIRING-DEVICE REQUIREMENTS

- A. Wiring Devices, Components, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
- B. Comply with NFPA 70.
- C. RoHS compliant.
- D. Comply with NEMA WD 1.
- E. Device Color:
 - 1. Wiring Devices Connected to Normal Power System: Match existing building color unless otherwise indicated or required by NFPA 70 or device listing.
- F. Wall Plate Color: For plastic covers, match device color.
- G. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.

2.2 SPECIFICATION GRADE RECEPTACLES, 125 V, 20 A

A. Tamper-Resistant Duplex Receptacles, 125 V, 20 A:

1. Description: Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle.
2. Configuration: NEMA WD 6, Configuration 5-20R.
3. Standards: Comply with UL 498 and FS W-C-596.
4. Marking: Listed and labeled as complying with NFPA 70, "Tamper-Resistant Receptacles" Article.

2.3 MOTOR RATED TOGGLE SWITCH, 2 & 3 pole, 30A

A. Toggle Disconnect Switch, 2 or 3 pole, 30A:

1. Description: 30A rated two or three pole switch as (poles number per application).
2. Configuration:
3. Lockable: Switch/Disconnect shall be provided with a raised switch cover that is lockable.
 - a. Mounting holes shall align with standard device holes.
 - b. Set to either on or off position. Lock can be inserted to hold in off position.

2.4 SPECIFICATION GRADE GFCI RECEPTACLES, 125 V, 20 A

A. Tamper- and Weather-Resistant, GFCI Duplex Receptacles, 125 V, 20 A:

1. Description: Integral GFCI with "Test" and "Reset" buttons and LED indicator light. Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle. Square face.
2. Configuration: NEMA WD 6, Configuration 5-15R.
3. Standards: Comply with UL 498 and UL 943 Class A.
4. Marking: Listed and labeled as complying with NFPA 70, "Tamper-Resistant Receptacles" and "Receptacles in Damp or Wet Locations" articles.

2.5 WALL PLATES

A. Single Source: Obtain wall plates from same manufacturer of wiring devices.

B. Single and combination types shall match corresponding wiring devices.

1. Plate-Securing Screws: Metal with head color to match plate finish.
2. Material for Finished Spaces: Smooth, high-impact thermoplastic.
3. Material for Unfinished Spaces: Smooth, high-impact thermoplastic.
4. Material for Damp Locations: Cast aluminum with spring-loaded lift cover and listed and labeled for use in wet and damp locations.

C. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with Type 3R, weather-resistant, die-cast aluminum with while-in-use lockable cover.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.
- B. Coordination with Other Trades:
 - 1. Protect installed devices and their boxes. Do not place wall finish materials over device boxes, and do not cut holes for boxes with routers that are guided by riding against outside of boxes.
 - 2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
 - 3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
 - 4. Install wiring devices after all wall preparation, including painting, is complete.
- C. Conductors:
 - 1. Do not strip insulation from conductors until right before they are spliced or terminated on devices.
 - 2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
 - 3. The length of free conductors at outlets for devices shall comply with NFPA 70, Article 300, without pigtails.
 - 4. Existing Conductors:
 - a. Cut back and pigtail or replace all damaged conductors.
 - b. Straighten conductors that remain and remove corrosion and foreign matter.
 - c. Pigtailing existing conductors is permitted, provided the outlet box is large enough.
- D. Device Installation:
 - 1. Replace devices that have been in temporary use during construction and that were installed before building finishing operations were complete.
 - 2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
 - 3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
 - 4. Connect devices to branch circuits using pigtails that are not less than 6 inches in length.
 - 5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, two-thirds to three-fourths of the way around terminal screw.
 - 6. Use a torque screwdriver when a torque is recommended or required by manufacturer.
 - 7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.
 - 8. Tighten unused terminal screws on the device.
 - 9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.
 - 10. At receptacle locations serving the MDF or an IDF, provide SPD type receptacle(s).

- E. Receptacle Orientation:
 - 1. Install ground pin of vertically mounted receptacles down, and on horizontally mounted receptacles to the left.
 - 2. Install hospital-grade receptacles in patient-care areas with the ground pin or neutral blade at the top.
- F. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.

3.2 GFCI RECEPTACLES

- A. Install non-feed-through GFCI receptacles where protection of downstream receptacles is not required.

3.3 FIELD QUALITY CONTROL

- A. Test Instruments: Use instruments that comply with UL 1436.
- B. Test Instrument for Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.
- C. Perform the following tests and inspections:
 - 1. In healthcare facilities, prepare reports that comply with NFPA 99.
 - 2. Test Instruments: Use instruments that comply with UL 1436.
 - 3. Test Instrument for Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.
- D. Tests for Receptacles:
 - 1. Line Voltage: Acceptable range is 105 to 132 V.
 - 2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is unacceptable.
 - 3. Ground Impedance: Values of up to 2 ohms are acceptable.
 - 4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
 - 5. Using the test plug, verify that the device and its outlet box are securely mounted.
 - 6. Tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault-current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new and retest as specified above.
- E. Test straight-blade convenience outlets in patient-care areas for the retention force of the grounding blade according to NFPA 99. Retention force shall be not less than 4 oz.
- F. Wiring device will be considered defective if it does not pass tests and inspections.

END OF SECTION

PART 1 - GENERAL

1.1 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.

1.2 SUMMARY

- A. Section Includes:
 - 1. Fusible switches.
 - 2. Nonfusible switches.
 - 3. Motor rated toggle switch, 2 or 3 pole 30A.
 - 4. Molded-case circuit breakers.

1.3 DEFINITIONS

- A. NC: Normally closed.
- B. NO: Normally open.
- C. SPDT: Single pole, double throw.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified testing agency.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS

- A. Source Limitations: Obtain enclosed switches and circuit breakers, overcurrent protective devices, components, and accessories, within same product category, from single manufacturer.
- B. Product Selection for Restricted Space: Drawings indicate maximum dimensions for enclosed switches and circuit breakers, including clearances between enclosures, and adjacent surfaces and other items. Comply with indicated maximum dimensions.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by an NRTL, and marked for intended location and application.
- D. Comply with NFPA 70.

2.2 FUSIBLE SWITCHES

A. Type HD, Heavy Duty:

1. Double throw.
2. Three pole.
3. 600-VAC.
4. 1200 A and smaller.
5. UL 98 and NEMA KS 1, horsepower rated, with clips or bolt pads to accommodate indicated fuses.
6. Lockable handle with capability to accept three padlocks and interlocked with cover in closed position.

B. Accessories:

1. Lugs: Mechanical type, suitable for number, size, and conductor material.
2. Service-Rated Switches: Labeled for use as service equipment.

2.3 NONFUSIBLE SWITCHES

A. Type HD, Heavy Duty, Three Pole, Double Throw, 600-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

B. Accessories:

1. Lugs: Mechanical type, suitable for number, size, and conductor material.
2. Service-Rated Switches: Labeled for use as service equipment.

2.4 MOTOR RATED TOGGLE SWITCH, 2 & 3 pole, 30A

A. Toggle Disconnect Switch, 2 or 3 pole, 30A:

1. Description: 30A rated two or three pole switch as (poles number per application).
2. Configuration:
3. Lockable: Switch/Disconnect shall be provided with a raised switch cover that is lockable.
 - a. Mounting holes shall align with standard device holes.
 - b. Set to either on or off position. Lock can be inserted to hold in off position.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine elements and surfaces to receive enclosed switches and circuit breakers for compliance with installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
 1. Commencement of work shall indicate Installer's acceptance of the areas and conditions as satisfactory.

3.2 ENCLOSURE ENVIRONMENTAL RATING APPLICATIONS

- A. Enclosed Switches and Circuit Breakers: Provide enclosures at installed locations with the following environmental ratings.
 - 1. Indoor, Dry and Clean Locations: NEMA 250, Type 1.
 - 2. Outdoor Locations: NEMA 250, Type 3R.

3.3 INSTALLATION

- A. Coordinate layout and installation of switches, circuit breakers, and components with equipment served and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.
- B. Install individual wall-mounted switches and circuit breakers with tops at uniform height unless otherwise indicated.
- C. Install fuses in fusible devices.
- D. Comply with NFPA 70 and NECA 1.

3.4 IDENTIFICATION

- A. Comply with requirements in Section 260553 "Identification for Electrical Systems."
 - 1. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.
 - 2. Label each enclosure with engraved metal or laminated-plastic nameplate.

3.5 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Tests and Inspections for Switches:
 - 1. Visual and Mechanical Inspection:
 - a. Inspect physical and mechanical condition.
 - b. Inspect anchorage, alignment, grounding, and clearances.
 - c. Verify that the unit is clean.
 - d. Verify blade alignment, blade penetration, travel stops, and mechanical operation.
 - e. Verify that fuse sizes and types match the Specifications and Drawings.
 - f. Verify that each fuse has adequate mechanical support and contact integrity.
 - g. Inspect bolted electrical connections for high resistance using one of the two following methods:
 - h. Verify lubrication of moving current-carrying parts and moving and sliding surfaces.
- C. Tests and Inspections for Molded Case Circuit Breakers:
 - 1. Visual and Mechanical Inspection:

SECTION 26 28 16
ENCLOSED SWITCHES AND
CIRCUIT BREAKERS

- a. Verify that equipment nameplate data are as described in the Specifications and shown on the Drawings.
- b. Inspect physical and mechanical condition.
- c. Inspect anchorage, alignment, grounding, and clearances.
- d. Verify that the unit is clean.
- e. Operate the circuit breaker to ensure smooth operation.
- f. Inspect bolted electrical connections for high resistance using one of the two following methods:
 - 1) Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method in accordance with manufacturer's published data or NETA ATS Table 100.12.

D. Enclosed switches and circuit breakers will be considered defective if they do not pass tests and inspections.

3.6 ADJUSTING

A. Adjust moving parts and operable components to function smoothly and lubricate as recommended by manufacturer.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Emergency lighting units.

1.2 DEFINITIONS

- A. CCT: Correlated color temperature.
- B. CRI: Color-rendering index.
- C. Lumen: Measured output of lamp and luminaire, or both.
- D. Luminaire: Complete lighting fixture, including ballast housing if provided.

1.3 ACTION SUBMITTALS

- A. Submittal No. 26 51 00 A - Shop Drawings: For nonstandard or custom lighting fixtures. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, product(s) indicated on Drawings.

2.2 GENERAL REQUIREMENTS FOR LIGHTING FIXTURES AND COMPONENTS

- A. Recessed Fixtures: Comply with NEMA LE 4 for ceiling compatibility for recessed fixtures.
- B. Incandescent Fixtures: Comply with UL 1598. Where LER is specified, test according to NEMA LE 5A.
- C. Metal Parts: Free of burrs and sharp corners and edges.
- D. Sheet Metal Components: Steel unless otherwise indicated. Form and support to prevent warping and sagging.

- E. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps and ballasts. Labels shall be located where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.
- F. Fixtures containing integral emergency battery backup components.
 - 1. Compliances:
 - a. NFPA 101 (Life Safety Code)
 - b. NFPA 70 (National Electrical Code) CEC-400-2014-009-CMF (CEC Battery Charger Efficiency Standard)
 - c. The emergency power system shall provide power for a duration of not less than 90 minutes and shall consist of storage batteries, unit equipment or an on-site generator (CBC 1008.3.4).

2.3 EMERGENCY LIGHTING UNITS

- A. General Requirements for Emergency Lighting Units: Self-contained units complying with UL 924.
 - 1. Battery: Sealed, maintenance-free, lead-acid type.
 - 2. Charger: Fully automatic, solid-state type with sealed transfer relay.
 - 3. Operation: Relay automatically turns lamp on when power-supply circuit voltage drops to 80 percent of nominal voltage or below. Lamp automatically disconnects from battery when voltage approaches deep-discharge level. When normal voltage is restored, relay disconnects lamps from battery, and battery is automatically recharged and floated on charger.
 - 4. Test Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.
 - 5. LED Indicator Light: Indicates normal power on. Normal glow indicates trickle charge; bright glow indicates charging at end of discharge cycle.
 - 6. Wire Guard: Heavy-chrome-plated wire guard protects lamp heads or fixtures.
 - 7. Remote Test: Switch in hand-held remote device aimed in direction of tested unit initiates coded infrared signal. Signal reception by factory-installed infrared receiver in tested unit triggers simulation of loss of its normal power supply, providing visual confirmation of either proper or failed emergency response.
 - 8. Integral Self-Test: Factory-installed electronic device automatically initiates code-required test of unit emergency operation at required intervals. Test failure is annunciated by an integral audible alarm and a flashing red LED.
 - 9. CEC Title 20 Compliant.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Lighting fixtures:
 - 1. Set level, plumb, and square with ceilings and walls unless otherwise indicated.
 - 2. Install lamps in each luminaire.
- B. Suspended Lighting Fixture Support:
 - 1. Pendants and Rods: Where longer than 48 inches, brace to limit swinging.

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LIGHTING**

2. Stem-Mounted, Single-Unit Fixtures: Suspend with twin-stem hangers.
3. Continuous Rows: Use tubing or stem for wiring at one point and tubing or rod for suspension for each unit length of fixture chassis, including one at each end.
4. Do not use grid as support for pendant luminaires. Connect support wires or rods to building structure.

3.2 FIELD QUALITY CONTROL

- A. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery and retransfer to normal.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. 9/125 micrometer, single mode, optical fiber cable (OS1).
2. Optical fiber cable connecting hardware, patch panels, and cross-connects.
3. Grounding.
4. Cabling identification products.

1.2 DEFINITIONS

- A. BICSI: Building Industry Consulting Service International.
- B. Cross-Connect: A facility enabling the termination of cable elements and their interconnection or cross-connection.
- C. RCDD: Registered Communications Distribution Designer.

1.3 OPTICAL FIBER HORIZONTAL CABLING DESCRIPTION

- A. Optical fiber horizontal cabling system shall provide interconnections between the fire alarm control panel, fire alarm annunciator, and the various fire alarm control units on site.
- B. Shall be suitable for use in indoors or in indoor/outdoor applications.

1.4 ACTION SUBMITTALS

- A. Submittal No. 27 15 23 A - Product Data: For each type of product.

1.5 QUALITY ASSURANCE

- A. Installation shall comply with TIA/EIA-569-A standards. At the Architect's request, the Engineer of Record shall perform a walkthrough/checklist to ascertain whether installation complies with minimum TIA/EIA-569-A standards.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Test cables upon receipt at Project site.
 1. Test optical fiber cable while on reels. Use an optical time domain reflectometer to verify the cable length and locate cable defects, splices, and connector, including the loss value of each. Retain test data and include the record in maintenance data.

**SECTION 27 15 23
COMMUNICATIONS OPTICAL FIBER
HORIZONTAL CABLING**

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install cables and connecting materials until wet work in spaces is complete and dry, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

1.8 COORDINATION

- A. Coordinate layout and installation of telecommunications pathways and cabling with Owner's telecommunications equipment and service suppliers.

1.9 WARRANTY

- A. Installer shall ensure that the Owner receives the manufacturer issued project warranty certificate within 60 calendar days of warranty registration.
- B. Workmanship: The installer shall issue the Owner a 20-year workmanship warranty on all installed products.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General Performance: Horizontal cabling system shall comply with transmission standards in TIA-568-C.1, when tested according to test procedures of this standard.
- B. Telecommunications Pathways and Spaces: Comply with TIA-569-D.
- C. Grounding: Comply with TIA-607-B.

2.2 9/125 MICROMETER SINGLE-MODE, INDOOR-OUTDOOR OPTICAL FIBER CABLE (OS1)

- A. Description: Single mode, 9/125-micrometer, 6 fibers, tight buffered, nonconductive optical fiber cable.
- B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1. Belden CDT Networking Division/NORDX.
 - 2. Berktek.
 - 3. Corning Cable Systems.
- C. Maximum Attenuation: 0.5 dB/km at 1310 nm; 0.5 dB/km at 1550 nm.
- D. Jacket:
 - 1. Jacket Color: Blue.
 - 2. Cable cordage jacket, fiber, unit, and group color shall be according to TIA-598-D.

**SECTION 27 15 23
COMMUNICATIONS OPTICAL FIBER
HORIZONTAL CABLING**

3. Imprinted with fiber count, fiber type, and aggregate length at regular intervals not to exceed 40 inches.

E. Standards:

1. Comply with TIA-492CAAA for detailed specifications.
2. Comply with TIA-568-C.3 for performance specifications.
3. Comply with ICEA S-104-696 for mechanical properties.

F. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 444, UL 1651, and NFPA 70 for the following types:

1. Plenum Rated, Nonconductive: Type OFNP, complying with NFPA 262.
2. Plenum Rated, Nonconductive: Type OFNP in listed plenum communications raceway.
3. Plenum Rated, Nonconductive: Type OFNP or Type OFNR in metallic conduit.
4. Plenum Rated, Nonconductive: Type OFNP, complying with NFPA 262; Type OFNP in listed plenum communications raceway; or Type OFN, Type OFNG, Type OFNP, or Type OFNR in metallic conduit.
5. Plenum Rated, Conductive: Type OFCP, complying with NFPA 262.
6. Plenum Rated, Conductive: Type OFCP or Type OFNP in listed plenum communications raceway.
7. Plenum Rated, Conductive: Type OFCP, Type OFNP, Type OFCR, or Type OFNR in metallic conduit installed per NFPA 70, Article 300.22, "Wiring in Ducts, Plenums, and Other Air-Handling Spaces."

2.3 IDENTIFICATION PRODUCTS

- A. Comply with TIA-606-B and UL 969 for a system of labeling materials, including label stocks, laminating adhesives, and inks used by label printers.

PART 3 - EXECUTION

3.1 WIRING METHODS

- A. Wiring Method: Conceal conductors and cables in accessible ceilings, walls, and floors where possible.
- B. Wiring within Enclosures: Comb, bundle, lace, and train cables within enclosures. Connect to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Provide and use lacing bars and distribution spools.

3.2 INSTALLATION OF OPTICAL FIBER BACKBONE CABLES

- A. Comply with NECA 1, NECA 301 and NECA/BICSI 568.
- B. General Requirements for Optical Fiber Cabling Installation:
 1. Comply with TIA-568-C.1 and TIA-568-C.3.
 2. Comply with BICSI ITSIMM, Ch. 6, "Cable Termination Practices."
 3. Terminate all cables; no cable shall contain unterminated elements. Make terminations only at indicated outlets, terminals, cross-connects, and patch panels.

**SECTION 27 15 23
COMMUNICATIONS OPTICAL FIBER
HORIZONTAL CABLING**

4. Cables shall be fusion spliced only within enclosures placed near fire alarm control equipment. Secure and support cables at intervals not exceeding 30 inches and not more than 6 inches from cabinets, boxes, fittings, outlets, racks, frames, and terminals.
5. Bundle, lace, and train cable to terminal points without exceeding manufacturer's limitations on bending radii, but not less than radii specified in BICSI ITSIMM, "Cabling Termination Practices" Chapter. Use lacing bars and distribution spools.
6. Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between termination, tap, or junction points. Remove and discard cable if damaged during installation and replace it with new cable.
7. Cold-Weather Installation: Bring cable to room temperature before dereeling. Heat lamps shall not be used for heating.
8. In the communications equipment room, provide a 10-foot-long service loop on each end of cable.
9. Pulling Cable: Comply with BICSI ITSIMM, Ch. 4, "Pulling Cable." Monitor cable pull tensions.
10. Cable may be terminated on connecting hardware that is rack or cabinet mounted.

3.3 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Perform tests and inspections.
- C. Tests and Inspections:
 1. Visually inspect optical fiber jacket materials for NRTL certification markings. Inspect cabling terminations in communications equipment rooms for compliance with color-coding for pin assignments and inspect cabling connections for compliance with TIA-568-C.1.
 2. Visually inspect cable placement, cable termination, grounding and bonding, equipment and patch cords, and labeling of all components.
 3. Optical Fiber Cable Tests:
 - a. Test instruments shall meet or exceed applicable requirements in TIA-568-C.1. Use only test cords and adapters that are qualified by test equipment manufacturer for channel or link test configuration.
 - b. Link End-to-End Attenuation Tests:
 - 1) Horizontal and Multimode Horizontal Link Measurements: Test at 850 or 1300 nm in one direction according to TIA-526-14-B, Method B, One Reference Jumper.
 - 2) Attenuation test results for horizontal links shall be less than 2.0 dB. Attenuation test results shall be less than those calculated according to equation in TIA-568-C.1.
- D. Remove and replace cabling where test results indicate that it does not comply with specified requirements.
- E. End-to-end cabling will be considered defective if it does not pass tests and inspections.

END OF SECTION

SECTION 28 46 21.11
ADDRESSABLE FIRE-ALARM SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 DEFINITIONS

- A. EMT: Electrical Metallic Tubing.
- B. FACP: Fire Alarm Control Panel (Master console to FACU's).
- C. FACU: Fire Alarm Control Unit (slave to FACP).
- D. NICET: National Institute for Certification in Engineering Technologies.
- E. RCU: Remote Command Unit, Remote Annunciator

1.3 ACTION SUBMITTALS

- A. The fire alarm system shall be function in full compliance with 2016 California Fire Code for Group E occupancies. All components shall be furnished for the fire alarm system which enables system-wide intercommunication between fire alarm equipment, voice annunciation selectable by zones, and selectable zones/digital microphone capability which shall be installed at the Fire Alarm Annunciator. The contractor shall provide and install all components recommended by Notifier not shown on plans for complete system installation (digital voice cards, cabinet brackets, etc.). No allowances shall be made for missed components that would normally be recommended by the manufacturer to produce a fully functional system.

- 1. Product Data: For each type of product, include furnished options and accessories.
 - a. Include construction details, material descriptions, dimensions, profiles, and finishes.
 - b. Include rated capacities, operating characteristics, and electrical characteristics.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For fire-alarm systems and components to include in emergency, operation, and maintenance manuals.
 - a. Comply with the "Records" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
 - b. Provide "Fire Alarm and Emergency Communications System Record of Completion Documents" according to the "Completion Documents" Article in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
 - c. Complete wiring diagrams showing connections between all devices and equipment. Each conductor shall be numbered at every junction point with indication of origination and termination points.

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ADDRESSABLE FIRE-ALARM SYSTEMS

- d. Provide "Inspection and Testing Form" according to the "Inspection, Testing and Maintenance" chapter in NFPA 72, and include the following:
 - 1) Equipment tested.
 - 2) Frequency of testing of installed components.
 - 3) Frequency of inspection of installed components.
 - 4) Requirements and recommendations related to results of maintenance.
 - 5) Manufacturer's user training manuals.
- e. Manufacturer's required maintenance related to system warranty requirements.
- f. Abbreviated operating instructions for mounting at fire-alarm control unit and each annunciator unit.

B. Software and Firmware Operational Documentation:

- 1. Software operating and upgrade manuals.
- 2. Program Software Backup: On magnetic media or compact disk, complete with data files.
- 3. Device address list.
- 4. Printout of software application and graphic screens.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Personnel shall be trained and certified by manufacturer for installation of units required for this Project. Installer's permanent place of business and base of operations shall be within 80 miles of the project site to ensure quality of installation and continued service of the system.
- B. NFPA Certification: Obtain certification according to NFPA 72 by a UL-listed alarm company.

1.6 PROJECT CONDITIONS

- A. Perform a full test of the existing system prior to starting work. Document any equipment or components not functioning as designed.

1.7 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace fire-alarm system equipment and components that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Extent: All equipment and components not covered in the Maintenance Service Agreement.
 - 2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- A. Source Limitations for Fire-Alarm System and Components: Components shall be compatible with, and operate as an extension of, existing system. Provide system manufacturer's certification that all components provided have been tested as, and will operate as, a system.

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ADDRESSABLE FIRE-ALARM SYSTEMS

- B. Noncoded, UL-certified addressable system, with multiplexed signal transmission and voice/strobe evacuation.
- C. Automatic sensitivity control of certain smoke detectors.
- D. All components provided shall be listed for use with the selected system.
- E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.2 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Fire-alarm control unit and raceways shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
 - 1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified."

2.3 DEVICE GUARDS

- A. Description: Welded wire mesh of size and shape for the speakers, strobes and beam detectors within the cafeteria.
 - 1. Factory fabricated and furnished by device manufacturer.
 - 2. Finish: Paint of color to match the protected device.

2.4 SURFACE MOUNTED RACEWAYS

- 1. Review Specification section 260533, RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions for compliance with requirements for ventilation, temperature, humidity, and other conditions affecting performance of the Work.
 - 1. Verify that manufacturer's written instructions for environmental conditions have been permanently established in spaces where equipment and wiring are installed, before installation begins.
- B. Examine roughing-in for electrical connections to verify actual locations of connections before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

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ADDRESSABLE FIRE-ALARM SYSTEMS

3.2 EQUIPMENT INSTALLATION

- A. Comply with NFPA 72, NFPA 101, and requirements of authorities having jurisdiction for installation and testing of fire-alarm equipment. Install all electrical wiring to comply with requirements in NFPA 70 including, but not limited to, Article 760, "Fire Alarm Systems."
1. Devices placed in service before all other trades have completed cleanup shall be replaced.
 2. Devices installed but not yet placed in service shall be protected from construction dust, debris, dirt, moisture, and damage according to manufacturer's written storage instructions.
- B. Install wall-mounted equipment, with tops of cabinets not more than 78 inches (1980 mm) above the finished floor.
- C. Fire Alarm Control Panel, Fire Alarm Control Units:
1. The contractor shall mount a minimum 6"H x 6"D x 24" wide enclosure above the fire alarm control panel or fire alarm control units for conduit entry to and from the fire alarm control panel. Splices shall not be made within the fire alarm control panel/units. Coordinate satisfactory installation with the fire alarm contractor. Where able, this enclosure shall be mounted above accessible ceiling space. Where no accessible ceiling space exists, mount the enclosure above the FACP at a height to be determined in the field between contracting parties.
- D. Manual Fire-Alarm Boxes:
1. Install manual fire-alarm box in the normal path of egress within 60 inches (1520 mm) of the exit doorway.
 2. Mount manual fire-alarm box on a background of a contrasting color.
 3. The operable part of manual fire-alarm box shall be between 42 inches (1060 mm) and 48 inches (1220 mm) above floor level. All devices shall be mounted at the same height unless otherwise indicated.
- E. Smoke- or Heat-Detector Spacing:
1. Comply with the "Smoke-Sensing Fire Detectors" section in the "Initiating Devices" chapter in NFPA 72, for smoke-detector spacing.
 2. Comply with the "Heat-Sensing Fire Detectors" section in the "Initiating Devices" chapter in NFPA 72, for heat-detector spacing.
 3. HVAC: Locate detectors not closer than 60 inches (1520 mm) from air-supply diffuser or return-air opening.
 4. Lighting Fixtures: Locate detectors not closer than 12 inches (300 mm) from any part of a lighting fixture and not directly above pendant mounted or indirect lighting.
- F. Install a cover on each smoke detector that is not placed in service during construction. Cover shall remain in place except during system testing. Remove cover prior to system turnover.
- G. Duct Smoke Detectors: Comply with NFPA 72 and NFPA 90A. Install sampling tubes so they extend the full width of duct. Tubes more than 36 inches (9100 mm) long shall be supported at both ends.
1. Do not install smoke detector in duct smoke-detector housing during construction. Install detector only during system testing and prior to system turnover.

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ADDRESSABLE FIRE-ALARM SYSTEMS

- H. Audible Alarm-Indicating Devices: Install not less than 6 inches (150 mm) below the ceiling.
- I. Device Location-Indicating Lights: Locate in public space near the device they monitor.

3.3 PATHWAYS

- A. Pathways above recessed ceilings and in non-accessible locations may be routed exposed.
 - 1. Exposed pathways located less than 96 inches (2440 mm) above the floor shall be installed in Wiremold. See Electrical Specifications 260533, "Raceways and Boxes for Electrical Systems".

3.4 DEVICE GUARDS

- A. Device guards shall be placed over initiation and notification devices in the following areas:
 - 1. Gymnasium/Cafeteria.
 - 2. Gymnasium stage.

3.5 IDENTIFICATION

- A. Install framed instructions in a location visible from fire-alarm control unit.

3.6 GROUNDING

- A. Ground fire-alarm control unit and associated circuits; comply with IEEE 1100. Install a ground wire from main service ground to fire-alarm control unit.
- B. Ground shielded cables at the control panel location only. Insulate shield at device location.

3.7 FIELD QUALITY CONTROL

- A. Field tests shall be witnessed by authorities having jurisdiction.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.
- C. Perform tests and inspections in accordance with this specification section and NFPA 72 Chapters 7 & 14.
 - 1. Visual Inspection: Conduct visual inspection prior to testing.
 - a. Inspection shall be based on completed record Drawings and system documentation that is required by the "Completion Documents, Preparation" table in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
 - b. Comply with the "Visual Inspection Frequencies" table in the "Inspection" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72; retain the "Initial/Reacceptance" column and list only the installed components.

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2. System Testing: Comply with the "Test Methods" table in the "Testing" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
 3. Test audible appliances for the public operating mode according to manufacturer's written instructions. Perform the test using a portable sound-level meter complying with Type 2 requirements in ANSI S1.4.
 4. Test audible appliances for the private operating mode according to manufacturer's written instructions.
 5. Test visible appliances for the public operating mode according to manufacturer's written instructions.
 6. Factory-authorized service representative shall prepare the "Fire Alarm System Record of Completion" in the "Documentation" section of the "Fundamentals" chapter in NFPA 72 and the "Inspection and Testing Form" in the "Records" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
- D. Reacceptance Testing: Perform reacceptance testing to verify the proper operation of added or replaced devices and appliances.
- E. Fire-alarm system will be considered defective if it does not pass tests and inspections.
- F. Prepare test and inspection reports.
- G. Maintenance Test and Inspection: Perform tests and inspections listed for weekly, monthly, quarterly, and semiannual periods. Use forms developed for initial tests and inspections.
- H. Annual Test and Inspection: One year after date of Substantial Completion, test fire-alarm system complying with visual and testing inspection requirements in NFPA 72. Use forms developed for initial tests and inspections.

3.8 DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain fire-alarm system.

END OF SECTION 284621.11

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Concrete sidewalks, concrete ramps and concrete stairs.
- B. Reinforcement.
- C. Surface finish.
- D. Curing.

1.02 REFERENCES

- A. ACI 301 - Specifications for Structural Concrete for Buildings.
- B. Standard specifications for public works projects.
- C. ANSI/ASTM D1751 - Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction.
- D. ANSI/ASTM D1752 - Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.
- E. ASTM A615 - Deformed and Plain Billet-Steel for Concrete Reinforcement.
- F. ASTM C33 - Concrete Aggregates.
- G. ASTM C94 - Ready Mixed Concrete.
- H. ASTM C150 - Portland Cement.
- I. ASTM C260 - Air-Entraining Admixtures for Concrete.
- J. ASTM C309 - Liquid Membrane-Forming Compounds for Curing Concrete.
- K. ASTM C494 - Chemical Admixtures for Concrete.
- L. Geotechnical Investigation Report.

1.03 QUALITY ASSURANCE

- A. Perform work in accordance with ACI 301.
- B. Obtain materials from same source throughout.

1.04 REGULATORY REQUIREMENTS

- A. Conform to standard specifications for public works construction, and City of Chico constructions standards for concrete work on public property.

1.05 TESTS

- A. Testing and analysis will be performed under provisions of Section 01 45 29.

- B. Submit proposed mix design of each class of concrete to Architect for review prior to commencement of work.
- C. Testing firm will take cylinders and perform slump tests in accordance with ACI 301.

1.06 SUBMITTALS

All submittals shall be made under the provisions of Section 01 33 00.

- A. Submittal No. 32 13 13 A – Product Data
 - 1. Submit product data for all specified products.
 - 2. Include data on joint filler, admixtures & curing compounds.
- B. Submittal No. 32 13 13 B – Installation Instructions
 - 1. Submit manufacturer's instructions for all specified products.

PART 2 PRODUCTS

2.01 CONCRETE MATERIALS

- A. Cement: ASTM C150 Normal-Type I
- B. Fine and Coarse Aggregates: ASTM C33.
- C. Water: Clean and not detrimental to concrete.

2.02 FORM MATERIALS

- A. Conform to ACI 301.

2.03 REINFORCEMENT

- A. Reinforcing Steel: ASTM A615; 40 ksi yield grade; deformed billet steel bars, finish.
- B. Tie Wire: Annealed steel, minimum 16 gage size.
- C. Dowels: ASTM A615; 40 ksi yield grade, plain steel, uncoated finish.

2.04 ACCESSORIES

- A. Curing Compound: Liquid membrane forming curing compound conforming to ASTM C309, type 1 suitable for spray application.
- B. Preform Joint: expansion joint filler shall be 1/2" thick, preformed asphalt-impregnated, expansion joint material conforming to ASTM D-1752.

2.05 ADMIXTURES

- A. Air Entrainment: ASTM C260.

2.06 CONCRETE MIX

- A. Mix concrete in accordance with ASTM C94.
- B. Provide concrete for sidewalks curbs and gutters of the following characteristics:
 - Compressive Strength at 28 days: 3000 psi
 - Maximum Aggregate Size: 1 inch
 - Maximum Slump (Formed): 4 inches
 - Maximum Slump (Extruded): 1-1/2 inches
- C. Use accelerating admixtures in cold weather only when approved by Architect/Engineer. Use of admixtures will not relax cold weather placement requirements.
- D. Use set-retarding admixtures during hot weather only when approved by Architect/Engineer.

PART 3 EXECUTION

3.01 INSPECTION

- A. Verify compacted aggregate base is ready to support paving and imposed loads.
- B. Verify gradients and elevations of base are correct.
- C. Beginning of installation means acceptance of existing conditions.

3.02 PREPARATION

- A. Moisten base to minimize absorption of water from fresh concrete.
- B. Notify Architect minimum 24 hours prior to commencement of concreting operations.

3.03 FORMING

- A. Place and secure forms to correct location, dimension, and profile.
- B. Assemble formwork to permit easy stripping and dismantling without damaging concrete.
- C. Place joint fillers vertical in position, in straight lines. Secure to formwork during concrete placement.

3.04 REINFORCEMENT

- A. Place reinforcement as shown on the plans.

3.05 FORMED JOINTS

- A. Locate control and expansion joints as indicated on site plan.

**SECTION 32 13 13
CONCRETE PAVING**

- B. Place joint filler between paving components and building or other appurtenances.
- C. Place expansion joints at 8 foot intervals maximum each way to correct elevation and profile.

3.06 PLACING CONCRETE

- A. Place concrete in accordance with ACI 301.
- B. Hot Weather Placement: ACI 305.
- C. Cold Weather Placement: ACI 306.
- D. Place concrete continuously between predetermined construction joints. Do not break or interrupt successive pours such that cold joints occur.
- E. Saw cut control joints 3/16 inch wide at an optimum time after finishing. Cut 1/3 into depth of slab.

3.07 FINISHING

- A. Ramp/Stairs Paving: Heavy broom.
- B. Sidewalk Paving: Light broom, rounded and trowel joint edges.
- C. Curbs and Gutters: Light broom.
- D. Place curing compound on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer's instructions.
- E. Fill all expansion joints with sealant per Section 07 90 00.

3.08 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed under provisions of Section 01 45 29.

3.09 PROTECTION

- A. Immediately after placement, protect concrete from premature drying, excessive hot or cold temperatures, and mechanical injury.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Portland Cement Concrete curbs and gutters.

1.2 RELATED DOCUMENTS

- A. American Concrete Institute (ACI):
 - 1. ACI 301 - Specifications for Structural Concrete for Buildings.
 - 2. ACI 308 - Standard Practice for Curing Concrete.
- B. American society for Testing and Materials (ASTM):
 - 1. ASTM A 185 - Specification for Steel Welded Wire, Fabric, Plain, for Concrete Reinforcement.
 - 2. ASTM A 615 - Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
 - 3. ASTM D 1751 - Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
- C. Caltrans Standard Specifications:
 - 1. Section 73: Concrete Curbs and Sidewalks.
 - 2. Section 90: Portland Cement Concrete.

1.3 DEFINITIONS

- A. ASTM: American Society for Testing Materials

1.4 SUBMITTALS

- A. Submittal procedures shall be as outlined in Section 01 33 00 – Submittal Procedures.
- B. Submittal No. 32 16 13 A - Concrete Mix Design: Have all concrete mixes designed by a testing laboratory and approved by the Owner. Conform all mixes to the applicable building code requirement, regardless of other minimum requirements listed herein or on the drawings. Submit mix designs for review before use. Show proportions and specific gravities of cement, fine and coarse aggregate, and water and gradation of combined aggregates.

1.5 QUALITY ASSURANCE

- A. Concrete shall be subject to quality assurance in accordance with Section 90 of the Standard Specifications.
- B. Certifications:
 - 1. Provide Owner at the time of delivery with certificates of compliance signed by both Contractor and Supplier containing the following statements:

Manzanita Elementary School Modernization
Redding School District
NMR Project No. 18-2877

**SECTION 32 16 13
CONCRETE CURBS AND GUTTERS**

- a. Materials contained comply with the requirements of the Contract Documents in all respects.
 - b. Proportions and mixing comply with the design mix approved by the Consulting Engineer. Design mix shall have been field tested in accordance with the herein requirements of the Caltrans Standard Specifications and produces the required compressive strength under like conditions.
 - c. Statement of type and amount of any admixtures.
2. Provide Owner, at time of delivery, with certified delivery ticket stating volume of concrete delivered and time of mixing, or time of load-out in case of transit mixers.
- C. Conform to the applicable provisions of Section 51, 73 and 90 of the Caltrans Standard Specification and these Technical Specifications.
- 1. Conform construction of portland cement concrete surface improvements (including curbs, gutters, medians, valley gutters, walks) to the requirements of Section 73 of the Caltrans Standard Specifications unless otherwise required in these Technical Specifications or shown on the Plans.
 - 2. Construct "V" ditches in accordance with Section 72-4 of the Standard Specifications; except that finishing shall be in accordance with Standard Specification Section 73 instead of 53, or as otherwise required in these Technical Specifications or shown on the Plans.

1.6 DESIGNATION

- A. General: Whenever the 28-day compressive strength is designated herein or on the Plans is 3,500 psi or greater, the concrete shall considered to be designated by compressive strength. The 28-day compressive strength shown herein or on the plans which are less than 3,500 psi are shown for design information only and are not considered a requirement for acceptance of the concrete. Whenever the concrete is designated by class or as minor concrete herein or on the Plans, the concrete shall contain the cement per cubic yard shown in Section 90-1.01 of the Caltrans Standard Specifications.

PART 2 PRODUCTS

2.1 GENERAL

- A. Comply with requirements of Section 32 05 23 – Cement and Concrete for Exterior Improvements.

2.2 PORTLAND CEMENT CONCRETE

- A. Unless specified otherwise herein or on the Plans, Portland Cement Concrete for items in this section shall be Minor Concrete as specified in Section 90-1.01 of the Caltrans Standard Specifications.

2.3 CURBS AND GUTTERS FORMS

- A. Use flexible spring-steel forms or laminated boards to form radius bends. Tolerance: Not

to deviate more than 1/4 inch in 10 feet in grade and alignment.

2.4 EXPANSION JOINT MATERIAL

- A. Material for expansion joints in portland cement concrete improvements shall be premolded expansion joint fillers conforming to the requirements of ASTM Designation D 1751. Expansion joint material shall be shaped to fit the cross section of the concrete prior to being placed. Suppliers certificates showing conformance with this specification shall be delivered with each shipment of materials delivered to the job site.
- B. Unless noted otherwise herein or on the Plans expansion joint thickness shall be as follows:
 - 1. Curbs, Curb Ramps, Island Paving, Driveways and Gutter Depressions: ¼-inch.

PART 3 EXECUTION

3.1 GENERAL

- A. Comply with requirements of Section 32 05 23 – Cement and Concrete for Exterior Improvements.
- B. Form, place and finish concrete walkways, island paving, valley gutters and driveway approaches in conformance with the applicable requirements of Section 73-1.04 and 73-1.06 of the Caltrans Standard Specifications as modified herein.
- C. Construct new concrete curb, curb and gutter and valley gutters against existing asphalt concrete by removing a minimum of 12-inches of the asphalt concrete to allow placement of curb or gutter forms. Patch pavement with a 6-inch deep lift of asphalt concrete after gutter form is removed.

3.2 SUBGRADE

- A. Conform to Section 40-1.04 of Caltrans Standard Specifications.

3.3 SOIL STERILANT

- A. Furnish and apply to areas indicated in accordance with Section 31 31 19 – Vegetation Control.

3.4 PLACING CONCRETE FORMS

- A. Form concrete improvements with a smooth and true upper edge. Side of the form with a smooth finish shall be placed next to concrete. Construct forms rigid enough to withstand the pressure of the fresh concrete to be placed without any distortion.
- B. Thoroughly clean all forms prior to placement and coat forms with an approved form oil in sufficient quantity to prevent adherence of concrete prior to placing concrete.
- C. Carefully set forms to the alignment and grade established and conform to the required dimensions. Rigidly hold forms in place by stakes set at satisfactory intervals. Provide sufficient clamps, spreaders and braces to insure the rigidity of the forms.
- D. Provide forms for back and face of curbs, lip of gutters and edge of walks, valley gutters or other surface slabs that are equal to the full depth of the concrete as shown, noted or

called for on the Plans. On curves and curb returns provide composite forms made from benders or thin planks of sufficient ply to ensure rigidity of the form.

3.5 PLACING STEEL REINFORCEMENT

- A. Bars shall be free of mortar, oil, dirt, excessive mill scale and scabby rust and other coatings of any character that would destroy or reduce the bond.
- B. Accurately place reinforcement as shown on the plans and hold firmly and securely in position by wiring at intersections and splices, and by providing precast mortar blocks or ferrous metal chairs, spacers, metal hangers, supporting wires, and other approved devices of sufficient strength to resist crushing under applied loads. Provide supports and ties of such strength and density to permit walking on reinforcing without undue displacement.
- C. Place reinforcing to provide the following minimum concrete cover:
 - 1. Surfaces exposed to water: 4-inches.
 - 2. Surfaces poured against earth: 3-inches.
 - 3. Formed surfaces exposed to earth or weather: 2-inches.
 - 4. Slabs, walls, not exposed to weather or earth: 1-inch.
- D. Minimum spacing, center of parallel bars shall be two and one half (2-1/2) times the diameter of the larger sized bar. Accurately tie reinforcing securely in place prior to pouring concrete. Placing of dowels or other reinforcing in the wet concrete is not permitted.

3.6 PLACING PORTLAND CEMENT CONCRETE

- A. Thoroughly wet subgrade when concrete is placed directly on soil. Remove all standing water prior to placing concrete.
- B. Do not place concrete until the subgrade and the forms have been approved.
- C. Convey concrete from mixer to final location as rapidly as possible by methods that prevent separation of the ingredients. Deposit concrete as nearly as possible in final position to avoid re-handling.
- D. Place and solidify concrete in forms without segregation by means of mechanical vibration or by other means as approved by the Owner. Continue vibration until the material is sufficiently consolidated and absent of all voids without causing segregation of material. The use of vibrators for extensive shifting of fresh concrete will not be permitted.
- E. Concrete in certain locations may be pumped into place upon prior approval by the Owner. When this procedure requires redesign of the mix, such redesign shall be submitted for approval in the same manner as herein specified for approval of design mixes.

3.7 EXPANSION JOINTS

- A. Construct expansion joints incorporating premolded joint fillers at twenty (20) foot intervals in all concrete curbs, gutters, median/island paving, valley gutters, driveway

**SECTION 32 16 13
CONCRETE CURBS AND GUTTERS**

approaches and at the ends of all returns. At each expansion joint install one-half inch by twelve inch (1/2" x 12") smooth slip dowels in the positions shown or noted on the detail drawings.

3.8 WEAKENED PLANE JOINTS

- A. Construct weakened plane joints in concrete curbs, gutters, median/island paving and valley gutters between expansion joints at ten (10) foot intervals throughout, or as otherwise indicated. Depth of joint score depth to be one-fourth (25%) the thickness of the concrete.
- B. Grooved Joints: Form weakened plane joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8-inch. Repeat grooving of weakened plane joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.

3.9 FINISHING CONCRETE

- A. Finish curb and gutter in conformance with the applicable requirements of Section 73-1.04 and 73-1.05A of the Caltrans Standard Specifications as modified herein.
- B. Where monolithic curb, gutter and sidewalk is specified, separate concrete pours will not be allowed.
- C. Provide a medium broom finish to all horizontal surfaces unless otherwise shown.

3.10 FORM REMOVAL

- A. Remove forms without damage to the concrete. Remove all shores and braces below the ground surface, before backfilling.
- B. Do not backfill against concrete until the concrete has developed sufficient strength to prevent damage.
- C. Leave edge forms in place at least 24 hours after pouring.

3.11 CONNECTING TO EXISTING CONCRETE IMPROVEMENTS

- A. New curb or gutter is to connect to existing improvements to remain by saw cutting to existing sound concrete at the nearest score line, expansion joint or control joint. Drill and insert 1/2-inch diameter by 12-inch long dowels at 24-inches on center into existing improvements. Install pre-molded expansion joint filler at the matching joint.
- B. A cold joint to the existing curb is not acceptable.

3.12 FIELD QUALITY CONTROL

- A. Conform the finish grade at top of curb, flow line of gutter, and the finish cross section of concrete improvements to the design grades and cross sections.
- B. Variation of concrete improvements from design grade and cross section as shown or called for on the plans shall not exceed the tolerances established in Sections 73-1.05 and/or 73-1.06 of the Caltrans Standard Specifications.

**SECTION 32 16 13
CONCRETE CURBS AND GUTTERS**

3.13 RESTORATION OF EXISTING IMPROVEMENTS

- A. Replace in kind all pavement or other improvements removed or damaged due to the installation of concrete improvements.
- B. Remove, landscaping or plantings damaged or disturbed due to the installation of concrete improvements. Replace in kind.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Fence framework, fabric, and accessories.
- B. Excavation for post bases.
- C. Concrete anchorage for posts.
- D. Manual gates and related hardware.

1.3 REFERENCES

- A. ASTM A90/A90M – Zinc alloy coating test methods.
- B. Product Manual CLF – 2445 – Chain Link Fence manufacturers institute.
- C. ASTM A123 - Pipe, Steel, Black and Hot-dipped Zinc-coated (Galvanized) Welded and Seamless, for Ordinary Uses.
- D. ASTM A392 – Zinc coated steel chain link fence fabric.
- E. ASTM A121 – Zinc coated steel barbed wire.
- F. ASTM F567 – Installation of chain link fencing.

1.4 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in commercial quality chain link fencing with five years experience.
- B. Installation: ANSI/ASTM F567.

1.5 SUBMITTALS

All submittals shall be submitted under the provisions of Section 01 33 00.

- A. Submittal No. 32 31 13 A – Shop Drawings
 - 1. Submit shop drawings for all specified products.
 - 2. Include plan layout, grid, spacing of components, accessories, fittings, hardware, anchorages, and schedule of components.
- B. Submittal No. 32 31 13 B – Product Data
 - 1. Submit product data for all specified products.
- C. Submittal No. 32 31 13 C – Installation Instructions
 - 1. Submit manufacturer's installation instructions for specified products.
- D. Submittal No. 32 31 13 D – Samples for Verification
 - 1. Submit samples for all specified products.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Anchor Fence Co.
- B. Builders Fence Co.
- C. Substitutions: Under provisions of Section 01 62 00.

2.2 MATERIALS

- A. Framework: ASTM A120; galvanized Schedule 40 steel pipe, standard weight, one piece without joints.
- B. Fabric: 2" mesh, 3.5 diamonds per foot of height, 9 gage, zinc coated steel wire fabric – ASTM A392. Knuckled top and bottom selvage.
- C. Steel Pipe: Type I: ASTM F-1083, Galvanized Schedule 40 steel pipe, standard weight, Framework and fittings.
- D. Fabric: Galvanized steel wire: ASTM F-668, Type 2B). ASTM A 641 Galvanized steel core wire, 9 gauge.

2.3 CONCRETE MIX

- A. Concrete: As specified in Section 03 30 00.

2.4 COMPONENTS

- A. Line Posts: See drawings for concrete footing dimensions
 - Fence fabric up to 6'-0": 1.90" O.D. galvanized steel pipe
 - Fence fabric up to 10'-0": 2.875" O.D. galvanized steel pipe
 - Fence fabric up to 16'-0": 4.000" O.D. galvanized steel pipe
- B. Pull, Corner and Terminal Posts: See drawings for concrete footing dimensions
 - Fence fabric up to 6'-0": 2.375" galvanized steel pipe
 - Fence fabric up to 10'-0": 2.875" galvanized steel pipe
- C. Top and Brace Rail: 1.66 inch diameter, plain end, sleeve coupled steel pipe - lengths not less than 18'-0".
- D. Gate Posts: See drawings for concrete footing dimensions
 - Gate fabric up to 6'-0" height
 - Up to 4'-0" wide gate: 2.375" O.D.
 - Up to 10'-0" wide gate: 2.875" O.D.
 - Up to 18'-0" wide gate: 4.0" O.D.
 - Gate fabric over 6'-0" to 12'-0" height
 - Up to 6'-0" wide gate: 2.875" O.D.
 - Up to 12'-0" wide gate: 4.000" O.D.
 - Up to 18'-0" wide gate: 6.625" O.D.
 - Up to 24'-0" wide gate: 8.625" O.D.

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CHAIN LINK FENCES AND GATES

- E. Gate Frame: Up to 12'-0" wide: 1.90" O.D.
Bracing: 1.66" O.D.
- F. Caps: steel or malleable iron, galvanized coated. Sized to post dimension, set screw retained.
- G. Fittings: Sleeves, bands, clips, rail ends, tension bars, fasteners and fittings: galvanized steel.
- H. Tension Wire: 7 gage thick steel, single strand.
- I. Swinging Gate Hardware: Fork type latch with gravity drop; center gate stop and drop rod; Mechanical keepers; two 180 degree gate hinges per leaf and hardware for padlock.
- J. Rolling Gate Hardware: Double gate track, double front wheel, track wheels, hardware for padlock.
- K. Swinging pedestrian Gate Hardware: Provide hardware in inset welded box as shown on Details – Lever Hardware – Sargent DG1-63-8226. Hardware to comply with 11B-404 and Section 08 71 00.

2.5 FABRICATION

- A. Gates: Construct gates with interior bracing and truss-rods to span opening without deflection.
- B. Accessories: Same finish as framing.

2.6 FINISHES

- A. Galvanized Coating.
- B. Accessories: Same finish as framing.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install framework, fabric, accessories and gates in accordance with ANSI/ASTM F567.
- B. Provide fence at heights noted on drawings.
- C. Space line posts at intervals not exceeding 10 feet. Set all posts as detailed in plans.
- D. Set terminal gate and posts plumb, in concrete footings with top of footing 2 inches below finish grade.
- E. Provide top rail through line post tops and splice with 7 inch long rail sleeves.
- F. Brace each gate and corner post back to adjacent line post with horizontal center brace rail and diagonal truss rods. Install brace rail, one bay from end and gate posts.
- G. Install center and bottom brace rail on all corner leaves, gate leaves, and at all 10 foot high fences.
- H. Stretch fabric between terminal posts or at intervals of 100 feet maximum, whichever is less.
- I. Position bottom of fabric 2 inches above finished grade.
- J. Fasten fabric to top rail, line posts, braces, bottom rail and bottom tension wire with wire ties

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maximum 15 inches on centers.

- K. Attach fabric to end, corner, and gate posts with tension bars and tension bar clips.
- L. Install bottom tension wire stretched taut between terminal posts - typical at all 6 foot high fences. Install bottom rail 1-5/8" diameter typical at all fences greater than 8 feet high.
- M. Install gates with fabric to match fence. Install three hinges per leaf, latch, catches, drop bolt and sockets retainer and locking clamp.
- N. Provide concrete center drop to foundation depth and drop rod retainers at center of double gate openings.

END OF SECTION