NOTICE TO BIDDERS

Notice is hereby given that the Chualar Union 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 a contract to construct the Track + Field Replacement and New Restroom Building at Chualar Union Elementary School, 24285 Lincoln Street. (the "Contract"), as per the Contract Documents, including the drawings and specifications, which may now be obtained electronically from the Architect, who is Peartree+Belli Architects, 235 Monterey Street, Suite B, (831) 424-4620.

The Owner reserves the right to add or deduct any of the additive or deductive items after the lowest responsible and responsive bidder is determined. The lowest bid shall be determined on the amount of the base bid.

This Contract ***is not*** subject to prequalification. See Instructions to Bidders for details.

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.

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 and proof of registration is provided.

For all projects over Twenty-Five Thousand Dollars ($25,000), the 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 Contract Time shall be two hundred fourteen (214) calendar days from Notice to Proceed, and liquidated damages for delay shall accrue.

1. **Mandatory site walk: May 19, 2026 at 3:00 PM**, meeting at Chualar Union Elementary School entrance area.
2. **Bids due and opened 1: 00 PM on May 29, 2026**, at the School Office at 24285 Lincoln Street, Chualar, CA 93925.

No bid will be accepted by the Owner after this time. Facsimile (FAX) copies of the bid will not be accepted. Bids may be opened immediately after the above deadline for

submittal, or at a later time, within the Owner's discretion.

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, as detailed in the Contract Documents.

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.

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 at the time of award and shall maintain that license in good standing through Completion of the Contract and all applicable warranty periods.

Advertisement (Public Contract Code §22037):

Publication Date (≥14 days before bid deadline) May 6, 2026

AND

Date of Mail and E-Mail to Trade Journals (≥15 days before bid deadline) May 6, 2026

By: David Peartree
Its: Architect of Record

Track+Field Replacement - Bid Schedule

1st Advertisement: 5/6/26

2nd Advertisement: 5/13/26

Mandatory Bid Walk: 5/19/26 @3pm

Final Bid RFI's: 5/25/26 @4pm

Final Addendum Release: 5/26/26 @4pm

Bids Due & Opening: 5/29/26 @1pm

Board Review/Approval: 6/10/26

INSTRUCTIONS TO BIDDERS

The Track + Field Replacement and New Restroom Building Contract for the
Chualar Union School District

SECURING DOCUMENTS:

The Contract Documents, including the Drawings and Specifications, are available at:
Peartree+Belli Architects
235 Monterey St. Suite B, Salinas, CA 93901
831-424-4620
Contact: Thomas Medrano | Email: thomas@peartreebelli.com

PREQUALIFICATION:

This Contract is not subject to prequalification.

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, SITE VISITS, OR MEETINGS:

Mandatory pre-bid conferences, site visits, or meetings will be held as described in the Notice to Bidders.

REQUEST FOR SITE VISIT AND INSPECTION:

A prospective bidder may request to visit and inspect the site, but any request must be submitted at least 10 working days before the bid opening, and the Owner may limit the length of the visit and inspection. If the Owner held an optional visit and inspection for all prospective bidders but the requesting bidder did not attend it, then the Owner may reject the bidder's request.

BUILDERS RISK COVERAGE:

For the purpose of builders risk coverage (see General Conditions Article 11), the project ***is not*** being solely funded by revenue bonds.

PROJECT LABOR AGREEMENT:

No project labor agreement applies to this contract.

USE OF FEDERAL FUNDS:

Federal funds are being used by Owner for this Contract, either in whole or in part, and thus the Contract is subject to, and Contractor shall comply with, all applicable federal laws, rules, regulations, and other requirements, including but not limited to the federal regulations set forth in CFR Title 2, Part 200, and the requirements set forth in Article 3 of the General Conditions.

BIDS:

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

1. Facsimile, e-mail, or other electronic copies of the Bid Form and other bid documents will not be accepted; only hard copies will be accepted. Bids shall be made on the Bid Form obtained from the Architect or Owner. Bids not made on the proper Bid Form shall be disregarded. Numbers must be stated in words and figures.

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. Signatures:

    A. Each bid must give the full business address of the bidder and be signed by bidder. 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 officers signing on behalf of a corporation shall be furnished with the bid.

B. The signatures on the Bid Form and other bid documents must be either (1) original longhand signatures in permanent blue ink, or (2) electronic signatures (including but not limited to digital signatures). In the event that the bidder submits the proposal with an electronic signature, the bidder, by submission of the bid, shall be acknowledging and agreeing that the electronic signature shall have the same legal effect as an original longhand signature, and that District agrees that the electronic signature shall have the same legal effect as an original signature.

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 (½) 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 (½) 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 (½) 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 Bid Forms must be accompanied by a completed Noncollusion 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 the form), Workers' Compensation certification, responses to the Contractor Questionnaire (if required; see Paragraph 13, below), and the DVBE Certification of Participation and the DVBE Good Faith Worksheet (if DVBE is required; see Paragraph 10, below).

8. Bids must be accompanied by a certified check, cashier's check, cash, 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 ☐ IS NOT SUBJECT TO THE DVBE REQUIREMENTS OF EDUCATION CODE SECTION 17076.11.** If this contract is subject to these requirements, then (a) the DVBE Certification must be submitted with the bid, and (b) the DVBE Worksheet must be submitted with the bid if Box D is checked on the first page of the DVBE Certification.

11. Contractors shall maintain their licenses in good standing through Completion of the Work and all applicable warranty periods. Owner shall 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 or failure to comply with the Contract Documents, and to reject any or all bids.

13. No responses to a Contractor Questionnaire are 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, including proof of signers' authority.
    B. Bid security.
    C. Designation of Subcontractors.
    D. Noncollusion Declaration.
    E. Sufficient Funds Declaration.
    F. Fingerprinting Notice and Acknowledgement.
    G. Workers' Compensation Certification.
    H. Iran Contracting Act Certification (if required by law; see the form).
    I. Responses to Contractor Questionnaire (if required; see above).
    J. DVBE Certification (if required; see above).
    K. DVBE Worksheet (if required; see above).
    L. Proof of registration per Labor Code §1725.5.

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 ninety (90) days after the date set for the opening thereof or any extension thereof. The Owner reserves the right to take more than ninety (90) days to make a decision regarding the rejection of the bid or the award of the Contract.

OPENING OF BIDS:

Opening of bids in public shall be at Owner's discretion, as set forth in the Notice to Bidders.

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 and 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

All bid protests must comply with the following, or they shall be rejected as invalid:

1. The protest shall be in writing;
2. The protest shall be filed and received no later than 4:00 p.m. on the fourth (4th) business day after the deadline for submittal of the bids;
3. The protest shall set forth in detail all grounds for the protest, including all facts, supporting documentation, legal authorities and arguments in support of the bid protest;
4. Before the bid protest deadline, the protesting party shall transmit the complete bid protest, including all documentation, to all other parties having a potential interest that may be adversely affected by the outcome of the protest, including but not limited to all other bidders who may have a reasonable prospect of losing or obtaining an award of the Contract depending on the outcome of the protest; and
5. All factual contentions must be supported by competent, admissible and credible evidence.

The procedures and time limits set forth in this section for bid protests are strictly construed and are protesting party's sole and exclusive remedy in the event of a bid protest. Protesting party's failure to strictly comply with these procedures and time limits shall constitute a waiver of any right to further pursue the bid protest, including but not limited to the presentation of a Government Code claim or legal proceedings. Any matter not set forth in the protest, including any ground for the protest or any evidence supporting a ground for the protest, shall be deemed waived.

A protesting party may not rely on the bid protest submitted by another protesting party, but must timely pursue its own bid protest.

Owner shall review a bid protest that was not rejected for failing to comply with the above procedures. Any final decision on such a bid protest 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, contracting work with whomever and in whatever manner, abandoning work entirely, and/or waiving any informality in receiving of bids are reserved as the rights of the Owner.

Before the Contract is awarded, the Contractor receiving the award shall submit the CARB Compliance Declaration, including all certificates, to the Owner.

Before the Contract is awarded, the Owner may, at its sole discretion, require from a potential Contractor on the Contract further evidence of the reasonable qualifications of such contractor to faithfully, capably, and reasonably perform the Contract and may consider such evidence before making its decision on the award of the Contract.

If awarded, the Contract shall be awarded to the lowest responsible and responsive bidder as indicated in the Notice to Bidders and as interpreted by the Owner under California law and as specified herein. Owner reserves the right, without any liability, to cancel the award of the Contract for any reason at any time before the full execution of the Agreement between Owner and Contractor.

EXECUTION OF AGREEMENT BETWEEN OWNER AND CONTRACTOR:

Contractor shall sign and return the Agreement within ten (10) days after mailing, faxing or delivery of the Notice of Award of Contract, or prior to the commencement of the Work, whichever is earlier. The Contractor shall sign the Agreement in as many originals as the Owner deems necessary. Within ten (10) days after mailing, faxing, or delivery of the Notice of Award of Contract, or prior to the commencement of the Work, whichever is earlier, the Contractor shall also submit to Owner the Contract payment and performance bonds; insurance certificates, additional insured endorsement, and declarations page; a Public Contract Code section 3006(a) Roof Project Certification, if required; the Drug-Free Workplace Certification; the Student Contact Form (see Attachment B to the Fingerprinting Notice and Acknowledgement); a schedule of values (see General Conditions §9.2.1.A); a schedule of cash flow (see General Conditions §9.2.1.B); and subcontractor information (see General Conditions §9.2.1.D). Within two (2) weeks after award the Work, or prior to commencement of the Work, whichever is earlier, the Contractor shall also submit to Owner the certified baseline schedule (see General Conditions §3.9.1). If the Contractor does not comply with this paragraph, Owner may revoke and/or cancel the award to the Contractor, award the Contract to the next lowest bidder, and pursue the low bidder and bid bond for damages, 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 Contractor. 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.

REQUESTS FOR SUBSTITUTION OF MATERIALS PRIOR TO BIDDING:

The Contractor must ensure that requested substitutions by the Contractor or its subcontractors are submitted to the Owner and Architect a minimum of ten (10) 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 by Owner prior to bid opening, including all equipment and materials deemed equivalent to those specified and approved by the Architect. Requests for substitution shall include comparative spec-data of the specified equipment or material and the proposed substitution as set forth in the Contract Documents; requests without this information will be automatically rejected. Requests for substitution shall be submitted on the Owner's form, which Owner shall provide upon request. Requests for substitution shall conform to the Contract Documents, including but not limited to General Conditions section 3.11.4.3.

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 Contract 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 two hundred fourteen (214) calendar days. See Article III of the Agreement for details.

Liquidated damages for delay in Completion of the Work within the Contract Time, or for delay in completion of a specified portion of the Work by a milestone deadline, 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.

COVID-19

During the Work, the Contractor shall ensure that all Work, including but not limited to Work performed by Subcontractors, is performed in compliance with all applicable legal, contractual, and local government requirements related to the novel coronavirus and COVID-19, including "social distancing," masks, and hygiene as may be ordered by the State or local authorities and as may be directed in the Contract Documents. Each bidder must include in its bid all costs related to these requirements in effect at the time of bidding. If additional COVID-19 requirements are imposed after the bid and the Contractor believes that it is entitled to additional time or money, it must timely submit proper requests pursuant to the Contract Documents.

SANCTIONS IN RESPONSE TO RUSSIAN AGGRESSION

The Owner requires Contractor to comply with the Governor's March 4, 2022, Executive Order N-6-22 ("Order") relating to any existing sanctions imposed by the United States government and the State of California in response to Russia's actions in Ukraine, including additional requirements for contracts of $5 million or more. Failure to comply may result in the termination of the Contract.

BID FORM

CHUALAR UNION SCHOOL DISTRICT
24285 LINCOLN STREET,
CHUALAR, CALIFORNIA 93925

Dear Board Members:

The undersigned, doing business under the firm name of _____, hereby proposes and agrees to enter into a contract, with the Chualar Union School District ("Owner"), to furnish any and all labor, materials, applicable taxes, equipment and services for the completion of Work as described hereinafter and in the Contract Documents as Bid Package: 2026-06 Chualar Union School District, Track & Field Replacement and New Restroom Building at Chualar Union Elementary School **(the "Contract").**

The Contract Documents were prepared by Peartree+Belli Architects, 235 Monterey St, Suite B, (831) 424-4620**.**

Bid Amount (Base Bid):

The undersigned proposes to furnish such labor, materials, applicable taxes, equipment and services for the amount of _____ Dollars ($_____).

This amount includes all allowances identified in the Agreement form, including but not limited to $195,000 for miscellaneous items as approved for use in writing by the District.

The Bidder shall separately identify the cost for the Track and Field Replacement Work from all other Work. The sum of the items below shall equal the Total Base Bid. Failure to provide this breakdown may result in the Bid being deemed non-responsive.

Base Bid:

- Track and Field Replacement Work: $_____
- Restroom Building $_____
- Entrance Fencing and ADA Improvements $_____
- Contingency Allowance: $ 195,000

Total Base Bid (sum of above): $_____

Miscellaneous:

The low bid shall be determined as described in the Notice to Bidders.

The undersigned shall, within ten (10) days after the date of such mailing, faxing, or delivering of a Notice of Award or prior to the commencement of the Work, whichever is earlier, 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 Instructions to Bidders.

The undersigned declares that it has read and understands the Contract Documents, including but not limited to the Notice to Bidders, the Instructions to Bidders, the Agreement, the General Conditions, the Drawings, the Specifications, and any Special Conditions.

Check one of the following boxes:

- ☐ The undersigned bidder is prequalified with the Owner pursuant to Public Contract Code section 20111.6 to submit a bid in the above amount for this Contract.
- ☒ Prequalification pursuant to Public Contract Code section 20111.6 is not required for this Contract.

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 _____

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

A bidder shall not submit this bid form unless the bidder's California contractor's license number appears clearly on it, the license expiration date and class are stated, and the bid form 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.

Proof of Bidder's registration per Labor Code §1725.5 must be submitted with this bid form.

NOTE: This bid form must give the full business address of the bidder and be signed by bidder with bidder's usual signature. 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. 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 officers signing on behalf of a corporation shall be furnished with the bid.

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.

Name of Company as Licensed in California: _____

Business Address: _____

Telephone Number: _____

California Contractor License No.: _____

Class and Expiration Date: _____

Public Works Contractor Registration No.: _____

State of Incorporation, if Applicable: _____

INDIVIDUAL:

_____ Dated: _____, 20__
_____ (*Name*)

PARTNERSHIP:

Evidence of authority to bind partnership is attached.

_____ Dated: _____, 20__
_____ (*Name*)
General Partner

CORPORATION:

Evidence of authority to bind corporation is attached.

_____ Dated: _____, 20__
_____ (*Name*)
_____ (Chairman, Pres., or Vice-Pres.)

_____ Dated: _____, 20__
_____ (*Name*)
_____ (Secretary, Asst. Secretary, CFO, or Asst. Treasurer)

BID BOND

Bond Number: _____

KNOW ALL MEN BY THESE PRESENTS that we the undersigned _____ as Principal and _____ as Surety, are hereby held and firmly bound unto the Chualar Union 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 the Chualar Union School District Track+Field Replacement and New Restroom Building at Chualar Union Elementary School, 24285 Lincoln Street, Chualar, CA 93925 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

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).

PERFORMANCE BOND

Bond Number: _____

KNOW ALL MEN BY THESE PRESENTS that we, _____, as Principal, and _____, as Surety, are held and firmly bound unto the Chualar Union School District, in the County of Monterey, 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

the Chualar Union School District Track+Field Replacement and New Restroom Building at Chualar Union Elementary School, 24285 Lincoln Street, Chualar, CA 93925 (the "Contract").

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, during 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 also shall 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. In the event that the Surety elects to complete the Work of the Contract after termination of the Contract by Owner, the Surety may not hire Principal, or any of Principal's owners, employees, or subcontractors, to perform the Work without the written consent of Owner, and the Owner may grant or withhold such consent within its sole discretion.

IN WITNESS WHEREOF, the above-bounden parties have executed this instrument under their several seals this _____ day of _____, 20__, 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)

Bond Number: _____

KNOW ALL MEN BY THESE PRESENTS:

That WHEREAS, the Chualar Union School District (the "Owner" of the public works contract 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

the Construction Contract, at Chualar Union Elementary School, which consists of Track+Field Replacement and New Restroom Building

which said agreement dated _____, 20__, 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.

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 _____, 20__.

(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

Owner: Chualar Union School District
Contract: The Track+Field Replacement and New Restroom Building
Site: Chualar Union Elementary School

The undersigned declares:

I am the _____ of _____, the party making the foregoing bid or proposal ("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 or proposer ("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 or proposing ("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

SUFFICIENT FUNDS DECLARATION
(Labor Code section 2810)

To Be Executed by Bidder and Submitted with Bid

Owner: Chualar Union School District
Contract: The Track+Field Replacement and New Restroom Building
Site: Chualar Union Elementary School

I, _____, declare that I am the _____ *[insert title]* 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 Project, including payment of prevailing wage, and that _____ *[insert name of 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: _____

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.)

DRUG-FREE WORKPLACE CERTIFICATION

The Drug-Free Workplace Act of 1990 (Government Code sections 8350 *et seq*.) 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

_____ _____
Print Name Date

FINGERPRINTING NOTICE AND ACKNOWLEDGMENT
FOR CONSTRUCTION CONTRACTS
(Education Code Section 45125.2)

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

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

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

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

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

    Prior to commencing the Work, you shall submit the Independent Contractor Student Contact Form (see ***Attachment B*** to this Notice and Acknowledgement) to the Owner, which will indicate which of the above methods you will use.

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

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

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

Dated: _____ _____
Signature

Name: _____ Title: _____

ATTACHMENT A

Violent and Serious Felonies

Under Education Code section 45125.2, no employee of a contractor or subcontractor who has been convicted of or has criminal proceedings pending for a violent or serious felony may come into contact with any student. A violent felony is any felony listed in subdivision (c) of Section 667.5 of the Penal Code. Those felonies are presently defined as:

(1) Murder or voluntary manslaughter.

(2) Mayhem.

(3) Rape as defined in paragraph (2) or (6) of subdivision (a) of Section 261 or paragraph (1) or (4) of subdivision (a) of Section 262.

(4) Sodomy as defined in subdivision (c) or (d) of Section 286.

(5) Oral copulation as defined in subdivision (c) or (d) of Section 288a.

(6) Lewd or lascivious act as defined in subdivision (a) or (b) of Section 288.

(7) Any felony punishable by death or imprisonment in the state prison for life.

(8) Any felony in which the defendant inflicts great bodily injury on any person other than an accomplice which has been charged and proved as provided for in Section 12022.7, 12022.8, or 12022.9 on or after July 1, 1977, or as specified prior to July 1, 1977, in Sections 213, 264, and 461, or any felony in which the defendant uses a firearm which use has been charged and proved as provided in subdivision (a) of Section 12022.3, or Section 12022.5 or 12022.55.

(9) Any robbery.

(10) Arson, in violation of subdivision (a) or (b) of Section 451.

(11) Sexual penetration as defined in subdivision (a) or (j) of Section 289.

(12) Attempted murder.

(13) A violation of Section 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.

(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.

ATTACHMENT B

STUDENT CONTACT FORM
FOR CONSTRUCTION CONTRACTS

Note: This form must be submitted by Contractor before it may commence any work.

Contractor Firm 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: _____

I am an owner or officer of Contractor authorized to sign this document on behalf of Contractor. Contractor acknowledges that the Owner has determined that Contractor's employees, or that Contractor as a sole proprietor, will have more than limited contact with students. Therefore, in order to comply with Education Code section 45125.2, Contractor will use the following methods to ensure student safety (check at least one):

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

[ ] Contractor is not a sole proprietorship, and its employees will be continually monitored and supervised by one of its employees 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:

_____

[ ] The Owner has agreed that Contractor's employees, or Contractor as sole proprietor, will be surveilled by Owner's personnel.

If Contractor does not comply with the requirements of Education Code section 45125.2, then Contractor will comply with the requirements of Education Code section 45125.1.

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

Dated: _____

Signature: _____
Typed Name: _____
Title: _____
Contractor: _____

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 (for all projects over Twenty-Five Thousand Dollars ($25,000)) public works contractor registration number 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.*

Portion of Work (description)	Portion of Work (dollar amount)	Name of Subcontractor & Phone No.	Location of Subcontractor	California Contractor License Number	Public Works Contractor Registration Number

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 _____ [*city*],_____[*state*].

Signature: _____

Print Name: _____

Title: _____

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).)

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

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.

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

PRIME BIDDER CERTIFICATION OF DISABLED VETERAN BUSINESS ENTERPRISE PARTICIPATION

To be completed by the Prime Bidder

PART I – IDENTIFICATION INFORMATION

BIDDER'S NAME	BUSINESS ADDRESS	TELEPHONE NUMBER
SCHOOL DISTRICT	**COUNTY**	**APPLICATION NO.**

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

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

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

Note: An Office of Small Business and 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, *if DVBE (own participation)*	$	$	$	$	$	$
B. DVBE Subcontractor or Supplier						
1.						
2.						
3.						
4.						
C. Subtotal (A & B)						
D. Non-DVBE						
E. Total Bid						

PRIME BIDDER GOOD FAITH EFFORT WORKSHEET

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

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

GENERAL INSTRUCTIONS:

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

PART I – CONTACTS

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

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

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

Attach copies of advertisements to this form.

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

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

IF THE DVBE…..	THEN…..	AND…..
Was selected to participate	Check "yes" in the "SELECTED" column, include the applicable dollar amount in Part III of the Prime Bidder Certification	Include a copy of their DVBE letter from 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 *This section must be completed*	NO RESPONSE
	YES	NO		

IMPORTANT NOTE:

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

CERTIFICATION

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

SIGNATURE OF CHIEF EXECUTIVE OFFICER	DATE

AGREEMENT BETWEEN OWNER AND CONTRACTOR

This Agreement, effective _____, 2026, is by and between the Chualar Union School District, in Monterey 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 required, by the Contract (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, and as specified in

the Track+Field Replacement and New Restroom Building
24285 Lincoln Street, Chualar, CA 93925

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

Peartree+Belli Architects
235 Monterey St. Suite B, Salinas, CA 93901
831-424-4620

and other Contract Documents relating thereto.

During the Work, the Contractor shall ensure that all Work, including but not limited to Work performed by Subcontractors, is performed in compliance with all applicable legal, contractual, and local government requirements related to COVID-19 and other public health emergencies, including "social distancing," masks, and hygiene as may be ordered by the State or local authorities and as may be directed in the Contract Documents. In addition, the Contractor and its Subcontractors shall follow standard operating procedures that follow the Center for Disease Control and Prevention (CDC), OSHA, state/territorial, and local guidelines for preventing the spread of COVID-19 infection.

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 are incorporated into this Agreement and 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 two hundred fourteen (214) calendar days which shall start to run on (a) the date of commencement of the Work as established in the Owner's Notice to Proceed, or (b) if no date of commencement is established in a Notice to Proceed from Owner, the date of Contractor's actual commencement of the Work (including mobilization).

The site for the Contract will not be available to the Contractor for construction on the following dates: The Contractor shall not be entitled to time extensions for lack of access to the site on these dates.

Failure to Complete the Work within the Contract Time and in the manner provided for by the Contract Documents, or failure to complete any specified portion of the Work by a milestone deadline, 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, or if any specified portion of the Work were not completed by a milestone deadline, 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, third party claims, and the incalculable inconvenience and loss suffered by the public.

Accordingly, the parties agree that $500 per calendar day of delay shall be the damages which the Owner shall directly incur upon failure of the Contractor to Complete the Work within the Contract Time or Complete any specified portion of the Work by a milestone deadline, as described above.

Liquidated damages will accrue for failure to meet milestone deadlines even if the Contractor Completes the Work within the Contract Time.

In addition, Contractor shall be subject to liquidated damages, or actual damages if liquidated damages are not recoverable under law, for causing another contractor on the Project to fail to timely complete its work under its contract or for causing delayed *completion* of the Project. The actual occurrence of damages and the actual amount of the damages which the Owner would suffer if another contractor on the Project were to fail to timely complete its work under its contract or delay *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 Work, loss of use of the other contractor's work, loss of use of the Project, disruption of activities, costs of administration and supervision, third party claims, the incalculable inconvenience and loss suffered by the public, and an

Owner's inability to recover its delay damages from the contractors whose work was delayed by Contractor.

Accordingly, the parties agree that $500 for each calendar day of delay shall be the amount of damages which the Owner shall directly incur upon Contractor causing another contractor on the Project to fail to timely complete its work under its contract or causing delayed *completion* of the Project.

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 they will accrue, 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 the Contract Documents after a default by reason of delays, the payment or payments shall in no respect constitute a waiver or modification of any provision in the Contract Documents regarding time of Completion, milestone deadlines, or 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.

The above contract price does not include any special allowances.

Any payment from a special allowance or general contingency allowance ("Allowance") is entirely at the discretion, and only with the advanced written approval, of the Owner. To request payment from an Allowance, the Contractor must fully comply with the Contract Documents' requirements related to Notice to Potential Changes, Change Order Requests, and Claims, including but not limited to Articles 4 and 7 of the General Conditions and its provisions regarding waiver of rights for failure to comply. If the Owner approves in writing a payment from an Allowance, no change order approved by Owner's governing body shall be required, but Contractor must sign an Allowance expenditure form, after which the Contractor may include a request for such payment in

its next progress payment application. Contractor's inclusion of a request for such payment in a progress payment application, or Contractor's acceptance of a progress payment that includes such payment, shall act as a full and complete waiver by Contractor of all rights to recover additional money related to the underlying basis of such payment; and such waiver shall be in addition to any other waiver that applies under the Contract Documents (including Article 4 of the General Conditions). If Contractor requests a time extension or other consideration in connection with or related to a requested payment from an Allowance, Contractor must comply with the Contract Documents' requirements related to Notice to Potential Changes, Change Order Requests, and Claims, including but not limited to Articles 4, 7, and 8 of the General Conditions and their provisions regarding waiver of rights for failure to comply, and no such time extension or other consideration may be issued until a change order is approved by the Owner's governing body pursuant to the Contract Documents. The amount of an Allowance may only be increased by a change order approved by Owner's governing body. Once an Allowance is fully spent, the Contractor must request any additional compensation pursuant to the procedures in the Contract Documents for Notices of Potential Claim, Change Order Requests, and Claims, and payment must be made by a change order approved by the Owner's governing body pursuant to the General Conditions. Upon Completion of the Work, all amounts in an Allowance that remain unspent and unencumbered shall remain the property of the Owner, Contractor shall have no claim to such funds, the Owner shall be entitled to a credit for such unused amounts against the above contract price, and the Owner may withhold such credit from any progress payment or release of retention.

For any cost reduction changes in the plans and specifications that the Owner makes pursuant to an unsolicited proposal submitted by Contractor, the Contractor shall receive additional payment of 50 percent of the net savings in construction costs as determined by the public entity, pursuant to Public Contract Code section 7101. Owner is not obligated to accept any proposal submitted by Contractor.

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, or are available at https://www.dir.ca.gov/oprl/dprewagedetermination.htm. 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 Law Enforcement. The Contractor shall as a penalty to the Owner forfeit Twenty-five Dollars ($25.00) for each worker employed in the execution of this Agreement by the Contractor or by any subcontractor for each calendar day during which such worker is required or permitted to work more than eight hours in any one calendar day, and forty hours in any one calendar week, except as herein provided.

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 throughout performance of the Contract. Contractor's comprehensive general and automobile liability insurance shall be written for not less than the following limits of liability:

Comprehensive General Liability

Each Occurrence:
$2,000,000__ Each Occurrence

Damage to Rented Premises:
$2,000,000___Each Occurrence

Medical Expenses:
$2,000,000___Any One Person

Personal and Advertising Injury:
$2,000,000___ Each Occurrence

General Aggregate:
$4,000,000___ Aggregate

Products – Completed Operations:
$2,000,000___ Aggregate

Comprehensive Automobile Liability

Combined Single Limit:
$2,000,000___ Each Accident

Property Damage:
$2,000,000__ Each Accident

Workers' Compensation

Worker's compensation insurance as required by Labor Code section 3200, *et seq*.

Employers' Liability

$2,000,000___ Each Accident
$2,000,000___ Disease – Each Employee
$2,000,000___ Disease – Policy 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 Monterey, 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 a change order, 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.

ARTICLE XX. SANCTIONS IN RESPONSE TO RUSSIAN AGGRESSION.

The Owner requires Contractor to comply with the Governor's March 4, 2022, Executive Order N-6-22 ("Order") relating to any existing sanctions imposed by the United States government and the State of California in response to Russia's actions in Ukraine, including additional reporting requirements for contracts of $5 million or more. Failure to comply may result in the termination of the Contract.

_____**(***CONTRACTOR***)**	**CHUALAR UNION SCHOOL DISTRICT**
_____ (*Name*)	_____ (*Name*)
_____ (Chairman, Pres., or Vice-Pres.)	_____ (*Title*)
_____ (*Name*)	_____ (Secretary, Asst. Secretary, CFO, or Asst. Treasurer)

_____
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.

GENERAL CONDITIONS

for

CONTRACT OF CONSTRUCTION

FOR THE TRACK+FIELD REPLACEMENT AND NEW RESTROOM BUILDING PROJECT

CHUALAR UNION SCHOOL DISTRICT

MAY 4, 2026

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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), 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, 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 Owner's 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.

1.1.4 THE PROJECT

The "Project" is the total construction of the Work performed in accordance with the Contract Documents, but "Project" may also include construction by the Owner or by separate contractors of improvements related to, but not included in, the Work. The Project shall constitute a "work of improvement" under Civil Code section 8050 and Public Contract Code section 7107.

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" under the Contract Documents, except to the extent that substantial completion is required for a milestone deadline.

1.1.10 COMPLETION OF THE PROJECT

For purposes of accrual of liquidated damages for delay 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 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, in the event of a conflict between provisions of the Contract Documents, it is intended that the more stringent, higher quality, and greater quantity of Work shall apply; except that in the event of a conflict between a Division 01 specification and a provision in a Division 00 Contract Document (such as the agreement, general conditions, notice to bidders, instructions to bidders, bid form, etc.), the Division 00 provision shall control.

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 Work, 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 of 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.

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 may order the Contractor to stop the Work or any portion thereof, until the Contractor corrects the deficiencies. Contractor shall not be entitled to a time extension for any delays caused by such order. 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. The Contractor shall perform the Work in a workmanlike manner, in compliance with the Contract Documents, and in compliance with all applicable local, state, and federal codes, regulations, and other law.

If part of the Project is performed by other contractors that Owner directly retains, Owner shall schedule and coordinate the activities of Contractor with the other contractors. Contractor agrees to accept the Owner'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 that may occur 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. Either party may audio record any meeting related to the Contract.

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 such facilities, labor, equipment, material, and services are included in the Work. Owner shall not be liable for, and Contractor shall bear the burden of, any post-bid escalation in the cost of materials; but Contractor will retain the benefit of any post-bid material cost decreases. Owner shall have no responsibility for security of, or repair or replacement costs of, such facilities, labor, equipment, material, and services 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, or required by the Contract or law to be secured, after execution of the Contract, and which are legally required from any authority having jurisdiction over the Project, except those required from 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, including any general contingency allowance, stated in the Contract Documents. Items covered by specific 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 Contractor seeks payment from an allowance and the requested costs are approved by Owner as compliant with the Contract Documents (including Sections 3.8.2.2 and 3.8.2.3, above), Owner may elect to pay the approved costs from the allowance, or pay the costs via Change Order. Any such allowance payment shall conform to the requirements of the Agreement and other Contract Documents.

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 an updated schedule by the first day of every month, and whenever else requested by the Owner. Each schedule update must 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 monthly schedule update shall be submitted regardless of whether the baseline schedule or other monthly schedule updates have previously been submitted.

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

The original schedule and all 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; reasonable dates for future Work; all construction activities (including procurement); the critical path schedule for Completion of the remainder of the Work; the logic, sequencing, and relationship between the construction activities, including each activity's predecessor and successor activities; and the percentage of the Work completed. The original schedule and all updates shall include a reasonable number of days for weather that is usual or common for each month, as time extensions are not available for such days (see Sections 4.5.5.3.2 and 8.4.1, below); and any failure by Contractor to include a reasonable number of such days, or by Owner to require Contractor to include a reasonable number of such days, shall not affect the reasonable number of such days to be used when determining time extensions under Sections 4.5.5.3.2 and 8.4.1, below. The original schedule and all updates shall include a reasonable number of days for usual or common delays by utility companies, and usual or common delays by other government agencies.

The construction schedule shall be in the form of either a tabulation, chart, or graph, and shall be in sufficient detail to show the chronological relationship of all activities of the Work 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 Work. 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 Work 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.

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 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 (including but not limited to any necessary acceleration). Contractor must submit a recovery plan within seven (7) days of a demand for the recovery plan. At a minimum, the recovery plan must include a proposed schedule that shows Completion of the Work by the contractual milestones and within the Contract Time, as adjusted by change orders, or Completion 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 specifically orders Contractor in writing to implement the recovery plan (including but not limited to acceleration), Contractor shall do so, but the order shall not act constitute an admission by Owner that Contractor is entitled to additional money for implementing the recovery plan. To recover additional money for implementing the recovery plan, Contractor must comply with General Conditions sections 4.5, 7 and 8. If Contractor elects to implement a recovery plan or otherwise accelerate the Work without a specific written order from the Owner to do so, then Contractor waives all rights to recover additional money for implementing that recovery plan or accelerating.

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

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

_____ *[Contractor company name]* has contracted with _____ *[public entity name]* for the _____ Contract ("Contract"). _____ *[Contractor company name]* authorized me to prepare schedules for _____ *[public entity name]* for this Project, 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 the Work (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.

_____ *[signature]*
_____ *[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 Contract and Contractor's name and dated, and each lot submitted must be accompanied by a letter of transmittal referring to the name of the Contract 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 Contract, 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. Any Requests submitted after the deadline specified in the Instructions to Bidders 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. All risks of delay due to the Division of the State Architect's approval, or the approval of any other governmental agency having jurisdiction, of a requested substitution shall be on the requesting party.

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 of 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 Work, or failure to construct the Work, 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 Work or failure to construct the Work 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.

3.19 RECOVERY OF COSTS, DAMAGES, OR TIME EXTENSIONS FROM OWNER

Notwithstanding any other provisions of the Contract Documents, Contractor expressly waives its right to recover any special, consequential, or indirect damages from Owner in relation to this Contract or the Project. Contractor may only recover general (also known as direct) damages from Owner to the extent allowed by the Contract Documents.

A Notice of Potential Change, Change Order Request and, if necessary, a Claim (see Sections 4.5, 7.2, and 7.6, below) are the exclusive means for Contractor to preserve its rights to recover any costs, damages, or time extensions related to the Contract or the Project from Owner, including but not limited to alleged breaches of contract based on extra work, delay, wrongful withholding, or wrongful termination. Contractor's failure to comply with the Contract Documents' procedures for a COR, CO, and Claim (including but not limited to Sections 4.5, 7.2, 7.6, and 7.7, below) may completely waive Contractor's rights to recovery any such costs or

damages.

3.20 USE OF FEDERAL FUNDS

Federal funds are being used in part for this Project (see the Instructions to Bidders), therefore the Project is subject to, and Contractor must comply with, all applicable federal laws including but not limited to the federal regulations set forth in CFR Title 2, Part 200. Accordingly, Contractor agrees to comply with all such federal requirements, including but not limited to the following:

A. EQUAL EMPLOYMENT OPPORTUNITY. Contractor agrees to comply with and be bound by Title 14, CFR, Section 60-1.4(b), in accordance with Executive Order 11246, "Equal Employment Opportunity" (30 FR 12319, 12935, 3 CFR Part, 1964-1965 Comp., p. 339), as amended by Executive Order 11375, "Amending Executive Order 11246 Relating to Equal Employment Opportunity," and implementing regulations at 41 CFR part 60, "Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor," the terms of which are incorporated by reference as though set forth in full herein.

B. DAVIS-BACON ACT. If the Contract Price exceeds $2,000, Contractor agrees to comply with and be bound by, and assist Owner in ensuring compliance with, the Davis-Bacon Act, as applicable and comply with the requirements and wage determinations. (40 U.S.C. §§ 3141-3144; 3146-3148 as supplemented by Department of Labor regulations (29 CFR Part 5, "Labor Standards Provisions Applicable to Contracts Covering Federally Financed and Assisted Construction").) Contractor is required to pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in a wage determination made by the Secretary of Labor. Additionally, Contractor is required to pay wages not less than once a week. Furthermore, pursuant to the Copeland "Anti-Kickback" Act (40 U.S.C. 3145), as supplemented by Department of Labor regulations (29 CFR Part 3, "Contractors and Subcontractors on Public Building or Public Work Financed in Whole or in Part by Loans or Grants from the United States"), Contractor is prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public work, to give up any part of the compensation to which he or she is otherwise entitled.

Any contract in excess of $2,000 is subject to the following:

(1) *Minimum Wages*

a. ***Wage rates and fringe benefits.*** All laborers and mechanics employed or working upon the site of the work (or otherwise working in construction or development of the project under a development statute), will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of basic hourly wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. As provided in paragraphs (d) and (e) of this section, the appropriate wage determinations are effective by

operation of law even if they have not been attached to the contract. Contributions made or costs reasonably anticipated for bona fide fringe benefits under the Davis-Bacon Act (40 U.S.C. 3141(2)(B)) on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (a)(1)(v) of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics must be paid the appropriate wage rate and fringe benefits on the wage determination for the classification(s) of work actually performed, without regard to skill, except as provided in paragraph (a)(4) of this section. Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: *Provided,* That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classifications and wage rates conformed under paragraph (a)(1)(iii) of this section) and the Davis-Bacon poster (WH–1321) must be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b. ***Frequently reoccurring classifications.***
   i. In addition to wage and fringe benefit rates that have been determined to be prevailing under the procedures set forth in 29 CFR part 1, a wage determination may contain, pursuant to § 1.3(f), wage and fringe benefit rates for classifications of laborers and mechanics for which conformance requests are regularly submitted pursuant to paragraph (a)(1)(iii) of this section, provided that:
      1. The work performed by the classification is not performed by a classification in the wage determination for which a prevailing wage rate has been determined;
      2. The classification is used in the area by the construction industry; and
      3. The wage rate for the classification bears a reasonable relationship to the prevailing wage rates contained in the wage determination.
   ii. The Administrator will establish wage rates for such classifications in accordance with paragraph (a)(1)(iii)(A)(*3*) of this section. Work performed in such a classification must be paid at no less than the wage and fringe benefit rate listed on the wage determination for such classification.

c. **Conformance.**
   i. The contracting officer must require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract be classified in conformance with the wage determination. Conformance of an additional classification and wage rate and fringe benefits is appropriate only when the following criteria have been met:
      1. The work to be performed by the classification requested is not performed by a classification in the wage determination; and

2. The classification is used in the area by the construction industry; and
3. The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

ii. The conformance process may not be used to split, subdivide, or otherwise avoid application of classifications listed in the wage determination.

iii. If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken will be sent by the contracting officer by email to *DBAconformance@dol.gov*. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30–day period that additional time is necessary.

iv. In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer will, by email to *DBAconformance@dol.gov,* refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30–day period that additional time is necessary.

v. The contracting officer must promptly notify the contractor of the action taken by the Wage and Hour Division under paragraphs (a)(1)(iii)(C) and (D) of this section. The contractor must furnish a written copy of such determination to each affected worker or it must be posted as a part of the wage determination. The wage rate (including fringe benefits where appropriate) determined pursuant to paragraph (a)(1)(iii)(C) or (D) of this section must be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

d. **Fringe benefits not expressed as an hourly rate.** Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor may either pay the benefit as stated in the wage determination or may pay another bona fide fringe benefit or an hourly cash equivalent thereof.

e. ***Unfunded plans.*** If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, *Provided,* That the Secretary of Labor has found, upon the written request of the contractor, in accordance with the criteria set forth in § 5.28, that the applicable standards of the Davis-Bacon Act have been met.

The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

f. ***Interest.*** In the event of a failure to pay all or part of the wages required by the contract, the contractor will be required to pay interest on any underpayment of wages.

(2) *Withholding*

a. ***Withholding requirements.*** Owner may, upon its own action, or must, upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor so much of the accrued payments or advances as may be considered necessary to satisfy the liabilities of the prime contractor or any subcontractor for the full amount of wages and monetary relief, including interest, required by the clauses set forth in paragraph (a) of this section for violations of this contract, or to satisfy any such liabilities required by any other Federal contract, or federally assisted contract subject to Davis-Bacon labor standards, that is held by the same prime contractor (as defined in § 5.2). The necessary funds may be withheld from the contractor under this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract that is subject to Davis-Bacon labor standards requirements and is held by the same prime contractor, regardless of whether the other contract was awarded or assisted by the same agency, and such funds may be used to satisfy the contractor liability for which the funds were withheld. In the event of a contractor's failure to pay any laborer or mechanic, including any apprentice or helper working on the site of the work (or otherwise working in construction or development of the project under a development statute) all or part of the wages required by the contract, or upon the contractor's failure to submit the required records as discussed in paragraph (a)(3)(iv) of this section, Owner may on its own initiative and after written notice to the contractor take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

b. ***Priority to withheld funds.*** The Department has priority to funds withheld or to be withheld in accordance with paragraph (a)(2)(i) or (b)(3)(i) of this section, or both, over claims to those funds by:

i. A contractor's surety(ies), including without limitation performance bond sureties and payment bond sureties;
ii. A contracting agency for its reprocurement costs;
iii. A trustee(s) (either a court-appointed trustee or a U.S. trustee, or both) in bankruptcy of a contractor, or a contractor's bankruptcy estate;
iv. A contractor's assignee(s);
v. A contractor's successor(s); or
vi. A claim asserted under the Prompt Payment Act, 31 U.S.C. 3901–3907.

(3) *Records and certified payrolls*

a. **Basic record requirements**

i. *Length of record retention.* All regular payrolls and other basic records must be maintained by the contractor and any subcontractor during the course of the work and preserved for all laborers and mechanics working at the site of the work (or otherwise working in construction or development of the

project under a development statute) for a period of at least 3 years after all the work on the prime contract is completed.

ii. *Information required.* Such records must contain the name; Social Security number; last known address, telephone number, and email address of each such worker; each worker's correct classification(s) of work actually performed; hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in 40 U.S.C. 3141(2)(B) of the Davis-Bacon Act); daily and weekly number of hours actually worked in total and on each covered contract; deductions made; and actual wages paid.

iii. *Additional records relating to fringe benefits.* Whenever the Secretary of Labor has found under paragraph (a)(1)(v) of this section that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in 40 U.S.C. 3141(2)(B) of the Davis-Bacon Act, the contractor must maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits.

iv. *Additional records relating to apprenticeship.* Contractors with apprentices working under approved programs must maintain written evidence of the registration of apprenticeship programs, the registration of the apprentices, and the ratios and wage rates prescribed in the applicable programs.

v. *Additional records relating to apprenticeship.* Contractors with apprentices working under approved programs must maintain written evidence of the registration of apprenticeship programs, the registration of the apprentices, and the ratios and wage rates prescribed in the applicable programs.

b. **Certified payroll requirements**

i. *Frequency and method of submission.* The contractor or subcontractor must submit weekly, for each week in which any DBA- or Related Acts-covered work is performed, certified payrolls to the appropriate Federal agency if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the certified payrolls to Owner, or other entity, as the case may be, that maintains such records, for transmission to the appropriate agency. The prime contractor is responsible for the submission of all certified payrolls by all subcontractors. A contracting agency or prime contractor may permit or require contractors to submit certified payrolls through an electronic system, as long as the electronic system requires a legally valid electronic signature; the system allows the contractor, the contracting agency, and the Department of Labor to access the certified payrolls upon request for at least 3 years after the work on the prime contract has been completed; and the contracting agency or prime contractor permits other methods of submission in situations where the contractor is unable or limited in its ability to use or access the electronic system.

ii. *Information required.* The certified payrolls submitted must set out accurately and completely all of the information required to be maintained under paragraph (a)(3)(i)(B) of this section, except that full Social Security numbers and last known addresses, telephone numbers, and email addresses must not be included on weekly transmittals. Instead, the certified payrolls need only include an individually identifying number for each worker (*e.g.,* the last four digits of the worker's Social Security number). The required weekly certified payroll information may be submitted using Optional Form WH–347 or in any other format desired. Optional Form WH–347 is available for this purpose from the Wage and Hour Division website at *https://www.dol.gov/sites/dolgov/files/WHD/legacy/files/wh347/.pdf* or its successor website. It is not a violation of this section for a prime contractor to require a subcontractor to provide full Social Security numbers and last known addresses, telephone numbers, and email addresses to the prime contractor for its own records, without weekly submission by the subcontractor to Owner, or other entity, as the case may be, that maintains such records).

iii. *Statement of Compliance.* Each certified payroll submitted must be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor, or the contractor's or subcontractor's agent who pays or supervises the payment of the persons working on the contract, and must certify the following:

1. That the certified payroll for the payroll period contains the information required to be provided under paragraph (a)(3)(ii) of this section, the appropriate information and basic records are being maintained under paragraph (a)(3)(i) of this section, and such information and records are correct and complete;
2. That each laborer or mechanic (including each helper and apprentice) working on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in 29 CFR part 3; and
3. That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification(s) of work actually performed, as specified in the applicable wage determination incorporated into the contract.

iv. *Use of Optional Form WH–347.* The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH–347 will satisfy the requirement for submission of the "Statement of Compliance" required by paragraph (a)(3)(ii)(C) of this section.

v. *Signature.* The signature by the contractor, subcontractor, or the contractor's or subcontractor's agent must be an original handwritten signature or a legally valid electronic signature.

vi. *Falsification.* The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under 18 U.S.C. 1001 and 31 U.S.C. 3729.

vii. *Length of certified payroll retention. The contractor or subcontractor must preserve all certified payrolls during the course of the work and for a period of 3 years after all the work on the prime contract is completed.*

viii. *Contracts, subcontracts, and related documents.* The contractor or subcontractor must maintain this contract or subcontract and related documents including, without limitation, bids, proposals, amendments, modifications, and extensions. The contractor or subcontractor must preserve these contracts, subcontracts, and related documents during the course of the work and for a period of 3 years after all the work on the prime contract is completed.

c. **Required disclosures and access**

i. *Required record disclosures and access to workers.* The contractor or subcontractor must make the records required under paragraphs (a)(3)(i) through (iii) of this section, and any other documents that the Owner or the Department of Labor deems necessary to determine compliance with the labor standards provisions of any of the applicable statutes referenced by § 5.1, available for inspection, copying, or transcription by Owner's authorized representatives or the Department of Labor, and must permit such representatives to interview workers during working hours on the job.

ii. *Sanctions for non-compliance with records and worker access requirements.* If the contractor or subcontractor fails to submit the required records or to make them available, or refuses to permit worker interviews during working hours on the job, the Federal agency may, after written notice to the contractor, Owner, or other entity, as the case may be, that maintains such records or that employs such workers, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available, or to permit worker interviews during working hours on the job, may be grounds for debarment action pursuant to § 5.12. In addition, any contractor or other person that fails to submit the required records or make those records available to WHD within the time WHD requests that the records be produced will be precluded from introducing as evidence in an administrative proceeding under 29 CFR part 6 any of the required records that were not provided or made available to WHD. WHD will take into consideration a reasonable request from the contractor or person for an extension of the time for submission of records. WHD will determine the reasonableness of the request and may consider, among other things, the location of the records and the volume of production.

iii. *Required information disclosures.* Contractors and subcontractors must maintain the full Social Security number and last known address, telephone number, and email address of each covered worker, and must provide them upon request to the appropriate Federal agency if the agency is a party to

the contract, or to the Wage and Hour Division of the Department of Labor. If the Federal agency is not such a party to the contract, the contractor, subcontractor, or both, must, upon request, provide the full Social Security number and last known address, telephone number, and email address of each covered worker to Owner, or other entity, as the case may be, that maintains such records, for transmission to the appropriate agency, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or other compliance action.

(4) *Apprentices and equal employment opportunity*

a. **Apprentices**

i. *Rate of pay.* Apprentices will be permitted to work at less than the predetermined rate for the work they perform when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship (OA), or with a State Apprenticeship Agency recognized by the OA. A person who is not individually registered in the program, but who has been certified by the OA or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice, will be permitted to work at less than the predetermined rate for the work they perform in the first 90 days of probationary employment as an apprentice in such a program. In the event the OA or a State Apprenticeship Agency recognized by the OA withdraws approval of an apprenticeship program, the contractor will no longer be permitted to use apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

ii. *Fringe benefits.* Apprentices must be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringe benefits must be paid in accordance with that determination.

iii. *Apprenticeship ratio.* The allowable ratio of apprentices to journeyworkers on the job site in any craft classification must not be greater than the ratio permitted to the contractor as to the entire work force under the registered program or the ratio applicable to the locality of the project pursuant to paragraph (a)(4)(i)(D) of this section. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated in paragraph (a)(4)(i)(A) of this section, must be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under this section must be paid not less than the applicable wage rate on the wage determination for the work actually performed.

iv. *Reciprocity of ratios and wage rates.* Where a contractor is performing construction on a project in a locality other than the locality in which its

program is registered, the ratios and wage rates (expressed in percentages of the journeyworker's hourly rate) applicable within the locality in which the construction is being performed must be observed. If there is no applicable ratio or wage rate for the locality of the project, the ratio and wage rate specified in the contractor's registered program must be observed.

b. ***Equal employment opportunity.*** The use of apprentices and journeyworkers under this part must be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

(5) *Compliance with Copeland Act requirements.* The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

(6) *Subcontracts.* The contractor or subcontractor must insert in any subcontracts the clauses contained in paragraphs (a)(1) through (11) of this section, along with the applicable wage determination(s) and such other clauses or contract modifications as the appropriate agency and/or Owner may by appropriate instructions require, and a clause requiring the subcontractors to include these clauses and wage determination(s) in any lower tier subcontracts. The prime contractor is responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in this section. In the event of any violations of these clauses, the prime contractor and any subcontractor(s) responsible will be liable for any unpaid wages and monetary relief, including interest from the date of the underpayment or loss, due to any workers of lower-tier subcontractors, and may be subject to debarment, as appropriate.

(7) *Contract termination: debarment.* A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

(8) *Compliance with Davis-Bacon and Related Act requirements.* All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

(9) *Disputes concerning labor standards.* Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

(10) *Certification of eligibility.*

a. By entering into this contract, the contractor certifies that neither it nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of 40 U.S.C. 3144(b) or § 5.12(a).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of 40 U.S.C. 3144(b) or § 5.12(a).

c. The penalty for making false statements is prescribed in the U.S. Code, Title 18 Crimes and Criminal Procedure, 18 U.S.C. 1001.

(11) ***Anti-retaliation.*** It is unlawful for any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, or to cause any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, any worker or job applicant for:

a. Notifying any contractor of any conduct which the worker reasonably believes constitutes a violation of the DBA, Related Acts, this part, or 29 CFR part 1 or 3;
b. Filing any complaint, initiating or causing to be initiated any proceeding, or otherwise asserting or seeking to assert on behalf of themselves or others any right or protection under the DBA, Related Acts, this part, or 29 CFR part 1 or 3;
c. Cooperating in any investigation or other compliance action, or testifying in any proceeding under the DBA, Related Acts, this part, or 29 CFR part 1 or 3; or
d. Informing any other person about their rights under the DBA, Related Acts, this part, or 29 CFR part 1 or 3.

(12) *Copies of Wage Determinations.* Copies of applicable wage determinations are included in the bid package for this contract, and are incorporated by reference as Contract Documents.

C. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT. If the Contract Price exceeds $100,000 that involve the employment of mechanics or laborers, Contractor agrees to comply with and be bound by, and assist Owner in ensuring compliance with, the Contract Work Hours and Safety Standards Act, as applicable. (40 U.S.C. 3702 and 3704, as supplemented by Department of Labor regulations (29 CFR Part 5).) Under 40 U.S.C. 3702 of the Act, each contractor must be required to compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week. The requirements of 40 U.S.C. 3704 are applicable to construction work and provide that no laborer or mechanic must be required to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous. These requirements do not apply to the purchases of supplies or materials or articles ordinarily available on the open market, or contracts for transportation or transmission of intelligence.

In addition to the above, any contract in excess of $100,000 is subject to the following:

(1) *Overtime requirements.* No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

(2) *Violation; liability for unpaid wages; liquidated damages.* In the event of any violation of the clause set forth in paragraph (b)(1) of this section the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages and interest from the date of the underpayment. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchpersons and guards, employed in violation of the clause set forth in paragraph (b)(1) of this section, in the sum of $31 for each calendar day on which such individual was required or permitted

to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (b)(1).

(3) Withholding for unpaid wages and liquidated damages

a. ***Withholding process.*** Owner may, upon its own action, or must, upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor so much of the accrued payments or advances as may be considered necessary to satisfy the liabilities of the prime contractor or any subcontractor for any unpaid wages; monetary relief, including interest; and liquidated damages required by the clauses set forth in this paragraph (b) on this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract subject to the Contract Work Hours and Safety Standards Act that is held by the same prime contractor (as defined in § 5.2). The necessary funds may be withheld from the contractor under this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract that is subject to the Contract Work Hours and Safety Standards Act and is held by the same prime contractor, regardless of whether the other contract was awarded or assisted by the same agency, and such funds may be used to satisfy the contractor liability for which the funds were withheld.

b. ***Priority to withheld funds.*** The Department has priority to funds withheld or to be withheld in accordance with paragraph (a)(2)(i) or (b)(3)(i) of this section, or both, over claims to those funds by:

i. A contractor's surety(ies), including without limitation performance bond sureties and payment bond sureties;
ii. A contracting agency for its reprocurement costs;
iii. A trustee(s) (either a court-appointed trustee or a U.S. trustee, or both) in bankruptcy of a contractor, or a contractor's bankruptcy estate;
iv. A contractor's assignee(s);
v. A contractor's successor(s); or
vi. A claim asserted under the Prompt Payment Act, 31 U.S.C. 3901–3907.

c. ***Subcontracts.*** The contractor or subcontractor must insert in any subcontracts the clauses set forth in paragraphs (b)(1) through (5) of this section and a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor is responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (b)(1) through (5). In the event of any violations of these clauses, the prime contractor and any subcontractor(s) responsible will be liable for any unpaid wages and monetary relief, including interest from the date of the underpayment or loss, due to any workers of lower-tier subcontractors, and associated liquidated damages and may be subject to debarment, as appropriate.

d. ***Anti-retaliation.*** It is unlawful for any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, or to cause any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, any worker or job applicant for:

i. Notifying any contractor of any conduct which the worker reasonably believes constitutes a violation of the Contract Work Hours and Safety Standards Act (CWHSSA) or its implementing regulations in this part;
ii. Filing any complaint, initiating or causing to be initiated any proceeding, or otherwise asserting or seeking to assert on behalf of themselves or others any right or protection under CWHSSA or this part;
iii. Cooperating in any investigation or other compliance action, or testifying in any proceeding under CWHSSA or this part; or
iv. Informing any other person about their rights under CWHSSA or this part.

D. RIGHTS TO INVENTIONS MADE UNDER A CONTRACT AGREEMENT. For all contracts that meet the definition of "funding agreement" under 37 CFR § 401.2 (a) and the recipient or subrecipient wishes to enter into a contract with a small business firm or nonprofit organization regarding the substitution of parties, assignment or performance of experimental, developmental, or research work under that "funding agreement," Contractor agrees to comply with and be bound by, and assist Owner in ensuring compliance with, 37 CFR Part 401, "Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements," the provisions of which are incorporated herein by this reference, and any implementing regulations issued by the awarding agency, as applicable.

E. CLEAN AIR AND FEDERAL WATER POLLUTION ACT CONTROL. If the Contract Price exceeds $150,000, Contractor agrees to comply with and be bound by, and assist Owner in ensuring compliance with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. 1251-1387). Any violations must be reported to the Federal awarding agency and the Regional Office of the Environmental Protection Agency (EPA).

F. DEBARMENT AND SUSPENSION. Contractor represents and warrants that it is not listed on the government-wide exclusions in the System for Award Management (SAM), and Contractor agrees to comply with and be bound by, and assist Owner in ensuring compliance with, the OMB guidelines at 2 CFR 180 that implement Executive Orders 12549 (3 CFR part 1986 Comp., p. 189) and 12689 (3 CFR part 1989 Comp., p. 235), "Debarment and Suspension." SAM Exclusions contains the names of parties debarred, suspended, or otherwise excluded by agencies, as well as parties declared ineligible under statutory or regulatory authority other than Executive Order 12549.

G. BYRD ANTI-LOBBYING AMENDMENT. If the Contract Price exceeds $100,000, Contractor agrees to comply with and be bound by, and assist Owner in ensuring compliance with, the Byrd Anti-Lobbying Amendment (31 U.S.C. § 1352). Contractor shall file the declaration and certification required by 31 U.S.C. § 1352(b).

H. PROCUREMENT OF RECOVERED MATERIALS. Contractor agrees to comply with, and be bound by, and assist Owner in ensuring compliance with, 2 CFR Section 200.323, as applicable.

I. PROHIBITION ON CERTAIN TELECOMMUNICATIONS AND VIDEO SURVEILLANCE SERVICES OR EQUIPMENT. Contractor agrees to comply with, and be bound by, and assist Owner in ensuring compliance with, 2 CFR Section 200.216, as applicable.

J. DOMESTIC PREFERENCES FOR PROCUREMENT. Contractor agrees to comply with, and be bound by, and assist Owner in ensuring compliance with, 2 CFR Section 200.322, as applicable. 2 CFR Section 200.322 requires Contractor to provide a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States (including but not limited to iron, aluminum, steel, cement, and other manufactured products), to the greatest extent practicable.

K. CONTRACTING WITH SMALL AND MINORITY BUSINESSES, WOMEN'S BUSINESS ENTERPRISES, AND LABOR SURPLUS AREA FIRMS. Contractor agrees to comply with, and be bound by, and assist Owner in ensuring compliance with, 2 CFR Section 200.321, as applicable. 2 CFR Section 200.321 requires Contractor to take the affirmative steps listed in 2 CFR Section 200.321 paragraphs (b)(1) through (5) to assure that minority businesses, women's business enterprises, and labor surplus area firms are used when possible.

L. SAFETY AND HEALTH STANDARDS. As required by 34 CFR 75.609, Contractor agrees to comply with and be bound by, and assist Owner in ensuring compliance with, the standards under the Federal Occupational Safety and Health Act of 1970 (29 U.S.C.A., Section 651 et seq.) and State and local codes to the extent that they are more stringent.

M. ENERGY CONSERVATION. As required by 34 CFR 75.616, Contractor agrees to construct facilities to maximize the efficient use of energy and to comply with and be bound by, and assist OWNER in ensuring compliance with, the following standards of the American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) set forth in 34 CFR 75.616. Contractor shall also comply with and be bound by, and assist Owner in ensuring compliance with, the mandatory standards and policies relating to energy efficiency which are contained in the state energy conservation plans issued in compliance with the Energy Policy and Conservation Act (Pub. L 94-163, 89 Stat. 871).

N. If any provision is required by federal law, or by the federal grant program funding such project, to be included in the Contract Documents, such provisions shall be deemed by the parties to have been included.

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 may 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 work pursuant to Section 9.7.1, below, 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.

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; ***except that*** to the extent that such additional services constitute Owner's delay damages under Public Contract Code section 7203, Owner may not recover them or invoice Contractor for them. 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 on any grounds (including but not limited to an alleged breach of an implied warranty of the correctness of the plans and specifications [*Souza & McCue Construction Co. v. Superior Court* (1962) 57 Cal.2d 508]), 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 the Contract Documents, including but not limited to Section 4.5 and Articles 7 and 8, 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 to the Owner for extra work (including acceleration or disruption), critical path delay, or additional money or time, including any money or time based on a request submitted to Contractor by one of Contractor's Subcontractors or suppliers (see Section 4.5.5.4, below). Contractor shall submit such Notices of Potential Change to Owner within five (5) days of the earlier of (a) Contractor becoming aware of the issue creating a potential change, or (b) the date by which Contractor should have become aware of the issue creating a potential 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 (including acceleration or disruption), 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.

If Contractor wants to accelerate its work to minimize or avoid delay, Contractor must submit a Notice of Potential Change for the delay, any delay damages, the need for any time extensions, and the cost impact of the desired acceleration. If Contractor's Work is disrupted and thus creates extra work or delay, Contractor must submit a Notice of Potential Change for the delay, any delay damages, the need for any time extensions, and the cost impact of the disruption.

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) based on an issue (including but not limited to money or time based on a request by a Subcontractor or supplier; see Section 4.5.5.4, below), then Contractor shall submit a Change Order Request ("COR"; see Section 7.6.1) to Owner within twenty (20) days of the earlier of (i) Contractor becoming aware of the issue creating a potential change, or (ii) the date by which Contractor should have become aware of the issue 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 include any information in a timely COR for that issue as specifically required by 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 or time 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. For any money or time other than the money and time specifically requested in the COR, Contractor will have completely waived its rights to recover such additional money or time (Contractor will not

have satisfied a condition precedent or exhausted administrative remedies). If the COR requests money, then the COR must explain how the requested amounts were calculated. If the COR requests time, then the COR must identify the number of days of time being requested, establish that the days of delay are excusable (see Section 8.4.1), and 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 of delay 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 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 deadline in the previous sentence shall not apply to the initial COR; it will only apply to the final COR (see above). 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 Contractor fails to submit the information within fifteen (15) days, then the COR shall be deemed rejected. 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 (including but not limited to a claim for damages based on misleading or incomplete plans or specifications); 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 sections 9204 or 20104 et seq., and any alleged violation of a prompt payment statute. 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 including any alleged breach of contract or violation of law by the Owner (such as wrongful withholding of a payment by the Owner or wrongful termination by the Owner). A Claim under this Article 4.5 shall also constitute a claim for purposes of the California False Claims Act. However, resubmittal of a COR which was previously rejected under Section 4.5.2 (whether rejected expressly [in whole or in part] or deemed rejected by Owner inaction), including but not limited to a request for reconsideration, does not constitute a Claim. 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 the earlier of (a) fifteen (15) days after Owner's rejection of a COR in whole or in part, or (b) fifteen (15) days after a COR being deemed rejected, pursuant to Section 4.5.2 above. If the Claim is not based on an issue for which a COR would be required (such as wrongful withholding by the Owner), then Contractor shall submit the Claim within fifteen (15) days after the date on which Contractor knew, or should

have known, about the issue on which the Claim is based. If a Claim has not been submitted as of the date that the Contractor Completes the Work and submittal of the Claim was not yet required under the Contract Documents, then the Claim shall be submitted within seven (7) days of Completion of the Work; and such Claim shall not be barred due to lack of a Notice of Potential Change or COR if the deadline for the Notice of Potential Change or COR was after Completion of the Work.

In addition, within seven (7) days of Completion of the Work, Contractor shall submit to Owner, in writing, a list and summary of all Claims for money or time extensions under or arising out of this Contract which were timely filed, which were 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 or Claim summary, failure to specifically identify a Claim in the Claim summary, or failure to include any information in a timely Claim as specifically required by 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), 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 contracted with ____ *[public entity name]* for the _____ Contract ("Contract").
> _____ *[Contractor company name]* authorized me to prepare the attached Claim for money and/or time extension for _____ *[public entity name]* regarding this Contract (such Claim being dated _____, 20__, and entitled _____, and requesting $_____

and/or ___ additional days), and I prepared the attached Claim. I am the most knowledgeable person at _____ *[Contractor company name]* regarding this Claim.

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

The attached Claim does not breach the Contract, 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.

_____ *[signature]*
_____ *[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 timely asserted in a certified Claim 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, all information establishing entitlement to a time extension pursuant to Section 8.4.1 below, a current and certified schedule (see Section 3.9.1, above), and a 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. Failure to include an updated and certified schedule, or a delay analysis, in a Claim seeking a time extension will act as a complete waiver of Contractor's rights to (i) recover money or time based on the issues addressed by the Claim, (ii) submit a Government Code Claim for the requested money or time (see Section 4.5.6.4), and (iii) initiate any action, proceeding or litigation for the requested money or time, regardless of the merits; Contractor will not have satisfied a condition precedent or exhausted administrative remedies.

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 *Unusual and Uncommon Weather Claims*

If unusual and uncommon weather is the basis for a Claim for additional time, Contractor's delay analysis (see Section 4.5.5.3.1, above) must also provide Owner data and facts showing that the weather conditions were unusual and uncommon for the period of time, could not have been

reasonably anticipated or mitigated, had an adverse effect on the critical path of the scheduled construction, and meet all other Contract requirements for a time extension (including but not limited to Section 8.4.1, below).

4.5.5.4 ***Subcontractor Requests for Money or Time***

A Subcontractor or supplier to Contractor may not submit a request for additional time or money directly to the Owner due to its lack of contractual privity with Owner. If a Subcontractor or supplier submits to Contractor a request for additional money or time based on an alleged breach of the subcontract or supplier contract by Contractor, then the Subcontractor or supplier must comply with the same procedures that would apply to any Contractor request to Owner for additional money or time.

For any Contractor request to Owner for additional money or time based on a Subcontractor's or supplier's request to Contractor for additional money or time (see previous paragraph), Contractor must comply with the requirements and prerequisites in the Contract Documents for requests to the Owner for additional money or time (including but not limited to this Section 4.5 of the General Conditions) and with Public Contract Code section 9204(d)(5).

Any Claim by Contractor pursuant to the previous paragraph must include Contractor's certification (see General Conditions §4.5.5.1), a complete copy of the Subcontractor's or supplier's request for money or time (including all documents submitted by the Subcontractor or supplier), and any other necessary supporting documentation. Any such Claim by Contractor must include (a) Contractor's detailed analysis of the merit of Subcontractor's or supplier's request to the Contractor, including (i) detailed analysis of Contractor's alleged breaches of the subcontract or supplier contract that allegedly caused the Subcontractor or supplier to incur damages or delay, and (ii) detailed analysis of all of Contractor's defenses to the request for money or time by the Subcontractor or supplier; and (b) detailed analysis of the Owner's liability to Contractor for any money or time that Contractor owes, or may later be determined to owe, to Subcontractor or supplier (including but not limited to how Owner's alleged breaches of the Contract Documents caused Contractor to breach the subcontract or supplier contract). In any such Claim, Contractor may deny that it is liable to the Subcontractor or supplier for some or all of the requested money or time, or it may assert that it is merely submitting the Claim to Owner on behalf of the Subcontractor or supplier; but doing one or the other would not excuse Contractor from complying with the above requirements for its request to the Owner.

Any failure by Contractor to timely comply with this Section 4.5.5.4 (including a failure to timely submit a Notice of Potential Change, COR, Claim, certification, or detailed analysis) shall act as a complete waiver of Contractor's rights to (a) recover money or time from Owner based on any money or time that Contractor owes, or may later be determined to owe, to the Subcontractor or supplier, (b) submit a Government Code Claim to Owner for the money or time requested by the Subcontractor or supplier (see Section 4.5.6.3), and (c) initiate any action, proceeding or litigation against Owner for any money or time that Contractor owes, or may later be determined to owe, to the Subcontractor or supplier. 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 and Public Contract Code section 9204, as well as the separate procedures and substantive provisions of Sections 4.5.1 through 4.5.5 and the rest of the Contract Documents. Claims of $375,000 or less are also subject to Public Contract Code sections 20104 et seq., but to the extent that one of the procedures in Sections 20104 et seq. conflicts with the procedures in Section 9204, the requirements of Section 9204 shall control.

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 an informal 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 informal conference may take place during regularly scheduled Project meetings. The informal conference is not a mediation since there is no neutral person facilitating communication to assist the parties to reach agreement; therefore, the provisions of Evidence Code sections 1115-1128 shall not apply to any portion of the informal conference (including but not limited to any documents provided or shown, or statements of fact or opinion made, by a party) unless the parties expressly agree in writing to their application. Any offer of compromise at an informal conference shall not be admissible to prove liability, as provided in Evidence Code section 1152, but this statute's prohibition of admissibility shall not apply to other statements before or at the informal conference, or in any document prepared for or

exchanged at the informal conference.

If Contractor fails to timely demand an informal conference 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) 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 informal 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 Contractor and Owner shall reasonably cooperate to schedule and attend a mediation as soon as reasonably possible; or they may agree to postpone mediation until the Work is Complete. 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 a Claim or any portion of it 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 occurring 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 commence upon accrual of a cause of action, and shall be tolled from the time the Contractor submits a written Claim under Section 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. For these purposes, a cause of action based on a Contractor request for additional compensation or a time extension shall accrue when the Change Order Request is rejected, or deemed rejected, by the Owner (see Section 4.5.2, above); and all other causes of action shall accrue when the alleged wrongful conduct (e.g., wrongful withholding, or wrongful termination) occurred. Owner's rejection of a Claim under Sections 4.5.3-4.5.6.2, above, would not give rise to a cause of action against Owner since the Claim addressed causes of action that already had accrued before the submission of the Claim.

4.5.7 CONTINUING CONTRACT PERFORMANCE

Despite Contractor's submission of, or Owner's rejection of, a Notice of Potential Change, COR, Claim, or Government Code Claim based on alleged breaches of the Contract by Owner, the Contractor shall proceed diligently and expeditiously with performance of the Contract as directed by Owner, and the Owner shall continue to make any undisputed payments in accordance with the Contract. Contractor acknowledges that Completion of the Work is a high priority for both Owner and Contractor as failure to Complete the Work would most likely cause each of them to incur much greater costs and damages than would be incurred if the Work were Completed. If Contractor believes that Owner has breached the Contract and that such breach is preventing or delaying Contractor's performance as directed by Owner, then Contractor must submit notice as required by Section 3.18, above.

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 any deadline for Completion provided by the Contract, but shall proceed with all Work to be performed under the Contract. The Contractor shall retain any and all rights provided either by Contract or by law which pertain to the resolution of disputes and protests between the contracting parties.

4.5.9 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 a Milestone Deadline or the 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 therefore. 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 related to the Contract 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 conditions of the Contract 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

Although the Owner 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, Contractor shall cooperate with Owner. 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 deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the

schedules to be used by the Contractor until subsequently revised.

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 the 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 for the cost of such damage or delay.

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 additional money or additional time, or both, as warranted under the Contract Documents for any extra work ordered by the Owner to be performed by Contractor; but such "extra work" shall not include any work or expense (a) that was known by, should have been known by, or was reasonably foreseeable to Contractor at the time of bidding, or (b) for which Contractor is responsible under the Contract Documents. Contractor shall follow the provisions of the Contract Documents, including General Conditions sections 4.5, 7.6, 7.7, and 8.4, when requesting additional money or additional time for such extra work. 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 Sections 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. Owner shall not be liable for, and Contractor shall bear the burden of, any post-bid escalation in the costs of construction, whether or not foreseeable; but Contractor will retain the benefit of any post-bid cost decreases, whether or not foreseeable, and will retain the right to request additional compensation for cost increases incurred due to Owner delay. 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 to Contractor signed by the Owner and directing performance of the Work or directing a change in the Work. The CCD may state an adjustment in the Contract Sum, Contract Time, or Milestone Deadline. 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 may be used by Owner 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; and if Contractor believes it is entitled to changes in the Contract Sum or Contract Time, it must comply with the Notice of Potential Change, COR and Claim procedures of Section 4.5.

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 (including but not limited to a "proposed change order" or "PCO") is any written request submitted by the Contractor asking the Owner for a change in the Contract Documents, including a request for additional money or time. However, a Claim (see Sections 4.5.3-4.5.6) is not a COR. See Section 4.5.2 for additional COR requirements. The COR shall include all information necessary to establish the Contractor's entitlement to the requested change.

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 a Milestone Deadline or Contract Time is requested, a COR shall also include delay analysis to validate any proposed change, 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 and profit. For overhead, including direct and indirect costs, submit documentation with the COR for all such costs. Overhead costs include, but are not limited to, job site or field overhead costs (including job site or field office), home office overhead costs, insurance costs, administrative costs, Site superintendent costs, general foreman costs, vehicle costs, cleaning costs, off-Site supervision, COR and CO preparation, negotiation, and research costs for Owner-initiated changes, delay costs, project interference and disruption costs, additional guaranty and warranty duration costs, additional temporary protection costs, additional temporary utilities costs, additional material handling costs, additional safety equipment costs, and any other costs for supplies, equipment, facilities or services not physically incorporated into the extra work or Work to be performed but necessary for completion of the extra work or Work. For extra work performed by the Contractor, the maximum markup for overhead and profit is 15% of the total of its materials, labor, and equipment costs (see above). For extra work performed by a subcontractor, that subcontractor's maximum markup for overhead and profit is 15% of the total of its materials, labor, and equipment costs (see above); and the maximum markup for overhead and profit that may be applied by the Contractor (or applied by any subcontractor in a tier higher than the subcontractor that performed the extra work) is 5% of the total submitted to the Contractor (or the total submitted to any higher tier subcontractor).

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.

	EXTRA	**CREDIT**

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, then add Subcontractor's overhead and profit to portions performed by Subcontractor, not to exceed fifteen percent (15%) of Subcontractor's portions.	_____	_____
F. 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 for the portion of the Work in Item G performed by subcontractors, not to exceed five percent (5%).	_____	_____
I. General Contractor's Overhead and Profit for the portion of the Work in Item G performed by Contractor, not to exceed fifteen percent (15%).	_____	_____
J. Subtotal	_____	_____
K. Bond premium increase (not to exceed one percent (1%) of Item J).	_____	_____
L. TOTAL	_____	_____

For any claimed overhead costs (whether field overhead (i.e., general conditions costs) or home office overhead) pursuant to Section 8.4.2 below, Contractor may not recover any mark ups for overhead or profit.

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, including Work directed pursuant to a CCD (see Section 7.3, above), 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 perform 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 Milestone Deadlines and Contract Time are reasonable periods 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 perform the Work diligently and expeditiously, including Work directed pursuant to a CCD (see Section 7.3, above), with adequate forces, labor, materials, equipment, services and management, shall achieve all Milestone Deadlines, and shall achieve Completion within the Contract Time.

8.4 EXTENSIONS OF TIME - LIQUIDATED DAMAGES

Contractor waives all rights and remedies as to any delay experienced during the Work (including any right to rescind the Contract and any right to refuse to perform the Contract) except for the rights and remedies expressly allowed by the Contract (including but not limited to time extensions and delay damages pursuant to this Section 8.4.1 and Section 8.4.2 below, and termination pursuant to Section 14.1 below).

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

The Contractor shall be granted a reasonable time extension under the Contract Documents, including but not limited to Sections 3.18 and 4.5 and Article 7, for excusable delays, which are those delays that meet each and every of the following conditions:

(a) The delay was beyond the control of Contractor and its subcontractors and material suppliers;

(b) The delay was caused by events that were not reasonably foreseeable to Contractor at the time of bidding;

(c) All float in the schedule had been used, and the delay impacted and delayed the controlling items of Work (i.e., the as-built critical path, as determined from the as-planned schedule and the actual progress of the Work), thus delaying the achievement of a Milestone Deadline or the Completion of the whole Work within the Contract Time;

(d) The delay was not caused by Contractor or its subcontractors or suppliers, including but not limited to their breaches of contract or the standard of care;

(e) The delay was not associated with loss of time resulting from the necessity of submittals to Owner for approval, or from necessary Owner surveys, measurements, inspections and testing;

(f) The delay was not caused by usual or common weather for the time of year, including usual or common severe weather; and

(g) The delay could not have been prevented or mitigated by the exercise of care, prudence, foresight, and diligence by Contractor.

Excusable delays may include acts of God, acts of public enemy, 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, unusual and uncommon weather for the time of year, unusual and uncommon delays by utility companies, unusual and uncommon delays by other government agencies, unforeseen site conditions, or delays of subcontractors due to such causes. Owner shall take into consideration other relevant factors such as concurrent delays. Contractor has the burden of proving that any delay was excusable.

Information or services under Owner's control will be furnished by the Owner with reasonable promptness. The Owner shall not be liable for any time extensions caused by factors beyond the Owner's control about which Contractor knew, or reasonably should have known, at the time of bidding, such as usual or common weather, usual or common delays by utility companies, or usual or common delays by other government agencies.

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 caused by a utility company's failure to perform despite Owner's reasonable arrangements for such performance, or a delay caused by another government agency; 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. Compensation shall be limited to field overhead (i.e., general conditions) and home office overhead, as may be allowed by law.

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 Contract Time and in the manner provided for by the Contract Documents, or failure to complete any specified portion of the Work by a milestone deadline, shall subject the Contractor to liquidated damages as described in Article III of the Agreement and the Contract Documents. Accordingly, the parties agree that the amount set forth in the 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.

In addition, delaying another contractor's work on the Project or causing delay to the *completion* of the Project shall subject the Contractor to liquidated damages as described in Article III of the Agreement and the Contract Documents. Accordingly, the parties agree that the amount set forth in the 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 Contractor delays the work of others on the Project or *completion* of the Project itself.

If liquidated damages accrue as described above, the Owner, in addition to all other remedies provided by law, shall have the right to assess and withhold as provided in Article III of the Agreement and the Contract Documents.

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 the Work. 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:

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;

J. Conditional and unconditional waivers and releases in exchange for progress payments, including final progress payments, in compliance with Civil Code sections 8132-8138; and

K. 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.

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, including all supporting documents required by 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 withholdings under Section 9.5.1 or 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 Owner'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, including credits for any unspent allowance;

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, including defense costs and attorneys' fees incurred due to Contractor's failure to defend an action pursuant to the indemnity provisions in the Contract Documents; 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 written notice of the items for which Owner is withholding amounts from a progress payment.

If Contractor claims a breach of contract or violation of law based on wrongful withholding by the Owner from a progress payment or based on a late progress payment, or if Contractor otherwise disputes any progress payment or lack thereof, then within fifteen (15) days of the alleged breach of contract, violation of law, or late or disputed progress payment Contractor shall submit a Claim pursuant and subject to Sections 4.5.3-4.5.6. The Contractor need not submit a Notice of Potential Change or a Change Order Request.

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.

Despite any withholding from a progress payment, or any other dispute about a progress payment, Contractor shall continue to expeditiously perform the Work pursuant to the Contract Documents, including but not limited to General Conditions sections 4.5.7, 7.1.1, 8.3.1, and 8.3.3.

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

Progress payments shall be made in accordance with Public Contract Code sections 7201, 9203, and 20104.50. Unless otherwise stated in the Contract Documents, within thirty (30) days after receipt of an undisputed and properly submitted Application for Payment ("properly submitted" means in compliance with the law and the Contract Documents, including submittal of all documents required to accompany the Application [see Section 9.3.1, above]), 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 withhold the other five percent (5%) of the undisputed value of the Work as retainage (or

"retention"). 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 one or more comprehensive lists 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).

Owner may record a Notice of Completion as allowed by Civil Code section 9200 *et seq*.

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.

For such partial occupancy, 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, and the period for correction of the Work under the Contract Documents. If the Owner and Contractor cannot reach agreement in writing, then the Owner may take partial occupancy and direct Contractor to perform Work as the Owner deems necessary; and if the Contractor believes that any of the directed Work requires additional compensation or time, then Contractor may seek an adjustment of compensation or time pursuant to Section 4.5, above.

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(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 Section 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 shall withhold not less than 5% of the Contract Sum ("retainage," or "retention") until Completion and acceptance of the Project, per Public Contract Code section 9203.

Owner may withhold from release or payment of retainage up to 150% of disputed amounts, including but not limited to the issues 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 Project. 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.

To claim a breach of contract or violation of law based on wrongful withholding by the Owner

from retention or based on a late payment or late release of retention, or if Contractor otherwise disputes any payment or release of retention or lack thereof, within fifteen (15) days of the alleged breach of contract, violation of law, or late or disputed payment/release of retention Contractor shall submit a Claim pursuant and subject to Sections 4.5.3-4.5.6. The Contractor need not submit a Notice of Potential Change or a Change Order Request.

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; except that for projects not solely funded through revenue bonds, (a) Contractor shall not be responsible for damages caused by a tidal wave to the extent that the damages exceed 5% of the Contract Sum, and (b) Contractor shall not be responsible for damages caused by an earthquake above 3.5 on the Richter Scale in magnitude to the extent that the damages exceed 5% of the Contract Sum, per Public Contract Code §7105(a).

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 Articles 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 (including its authorized representatives; see Section 2.1, above) as additional insureds. Subcontractors shall name the Contractor and the Owner 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 including tidal wave (however, for projects not solely funded through revenue bonds, Contractor is only required to provide insurance for damages caused by a tidal wave up to 5% of the Contract Sum [except as provided in Section 11.1.6.2, below; see Public Contract Code §7105(a)]), earthquake (however, for projects not solely funded through revenue bonds, Contractor is only required to provide insurance for damages caused by a large earthquake [i.e., one above 3.5 magnitude on the Richter Scale] up to 5% of the Contract Sum [except as provided in Section 11.1.6.3, below; see Public Contract Code §7105(a)]), 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.

11.1.6.2 TIDAL WAVE INSURANCE

If the Contract is not solely funded through revenue bonds and Owner accepts and awards an alternate bid by Contractor for insurance coverage for a tidal wave, Contractor shall maintain, in effect during the Work and until final acceptance of the Work by Owner upon Completion of the entire Contract, insurance providing coverage for loss, destruction or damage arising out of or caused by tidal wave and other similar acts of God. This insurance shall provide coverage in an amount not less than the full cost to repair, replace or reconstruct the Work.

11.1.6.3 EARTHQUAKE INSURANCE

If the Contract is not solely funded through revenue bonds and Owner accepts and awards an alternate bid by Contractor for insurance coverage for an earthquake over 3.5 on the Richter Scale, Contractor shall maintain, in effect during the Work and until final acceptance of the Work by Owner upon Completion of the entire Contract, insurance providing coverage for loss, destruction or damage arising out of or caused by earthquake and/or other earth movement, whether seismic or volcanic in origin, over 3.5 on the Richter Scale in magnitude. This insurance shall provide coverage in an amount not less than the full cost to repair, replace or reconstruct the Work**.**

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 Work rejected by the Owner prior to Completion for failure to conform to the requirements of the Contract Documents. 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 Sections 3.5 and 9.7.1, 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. 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, 9.7.1, 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 under the Contract Documents (including but not limited to a patent or latent deficiency).

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, any written notice required by the Contract Documents 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 the 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 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, 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 Contractor.

13.10.8 DECISIONS OF JOINT APPRENTICESHIP COMMITTEE

All decisions of the joint apprenticeship committee under this section13.10 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, penalties shall apply, including 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 Completion of the Work, Owner shall also have the right to an audit of all of Contractor's books, records, subcontracts, material and equipment contracts, files, and information related to the Contract, and Contractor must cooperate by producing all requested items within seven (7) days for inspection or copying by Owner.

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.

13.14 **USE OF LEAD PAINT, PLUMBING, ETC. PROHIBITED** {TC "13.14 USE OF LEAD PAINT, PLUMBING, ETC. PROHIBITED"}

New school facilities under construction, or school facilities undergoing a modernization or renovation program, shall not utilize lead-based paint, lead plumbing or solders, or other potential sources of lead contamination (added by stats. 1992, c. 1317 (A.B. 1659) of General Education Code Provisions).

The California Health and Safety Code, Section 116875, effective January 1, 2010, states in part and requires that, no person shall use any pipe, pipe or plumbing fitting or fixture, or solder or flux that is not lead free in the installation or repair of any public water system or any plumbing in a facility providing for human consumption.

Water from new, contractor-installed drinking water fixtures shall meet current EPA

requirements for drinking water. Drinking water fixtures will be considered non-compliant items subject to correction at no additional cost to the Owner. Drinking water fixtures include all fixtures that are likely sources of drinking water including but not limited to; drinking fountains, classroom sinks and bubblers, kitchen sinks, faculty sinks and nurse sinks.

Contractor shall adequately flush all newly installed drinking water fixtures prior to testing. Drinking water fixtures shall be flushed multiple times daily for a minimum of two weeks prior to testing.

Where drinking water fixtures have been installed but not tested, or where drinking water fixtures have not met the requirements specified herein, Contractor shall flush each fixture multiple times per day and maintain a detailed and accurate flushing log until such time acceptable testing results are achieved. At a minimum, Contractor shall be required to flush each drinking water fixture prior to the start of school each day.

Flushing logs must include dates, times and duration for each flushing event at each fixture. Contractor must sign and certify flushing logs are true and accurate and submit to the Owner on a weekly basis.

Upon completion of final cleaning, Contractor shall request final test and acceptance of dust wipe sampling for lead. Contractor shall give the Owner and Owner's Environmental Consultant forty-eight (48) hours written notice, excluding weekends and Owner holidays, of when and where testing is required. All test and acceptance dust wipe samples shall be below 10 micrograms of lead per square foot prior to occupancy.

ARTICLE 14

TERMINATION OR SUSPENSION OF THE CONTRACT

14.1 TERMINATION BY THE CONTRACTOR FOR CAUSE

Contractor may not terminate performance for convenience. Contractor may only terminate performance 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 performance of 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 to meet a Milestone Deadline or to Complete 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"). Owner has the discretion to include in its Notice of Intent to Terminate an option for the Contractor to 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.

Owner may terminate the performance of the Contract if (a) Contractor fails to completely cure the grounds for termination within seven (7) days, and (b) Contractor fails to 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 (if Owner had offered this alternative to Contractor in its Notice of Intent to Terminate). Such termination shall be effective immediately upon service of a written Notice of Termination, and Owner may, subject to any prior rights of Contractor's surety on the performance bond ("Surety"), do the following:

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, including the tender of Completion to the Surety or the hire of another contractor to Complete the Work.

14.2.3 **PAYMENTS**

If the Owner terminates performance of 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.

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

14.2.4 **WRONGFUL TERMINATION**

To claim a breach of contract or violation of law based on alleged wrongful termination for cause by the Owner, or if Contractor otherwise seeks any payment or damages related to a termination, within fifteen (15) days of the alleged breach of contract, violation of law, or wrongful termination Contractor shall submit a Claim pursuant and subject to Sections 4.5.3-4.5.6. The Contractor need not submit a Notice of Potential Change or a Change Order Request.

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 performance of 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 of performance by Contractor 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 performance of 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

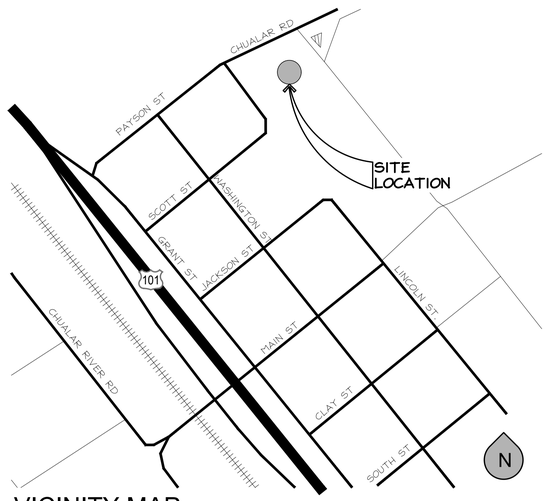
the fiscal period for which funds have been appropriated or allocated and for which the Work has not been done.

TRACK + FIELD REPLACEMENT AND NEW RESTROOM BUILDING FOR:

CHUALAR UNION E.S.

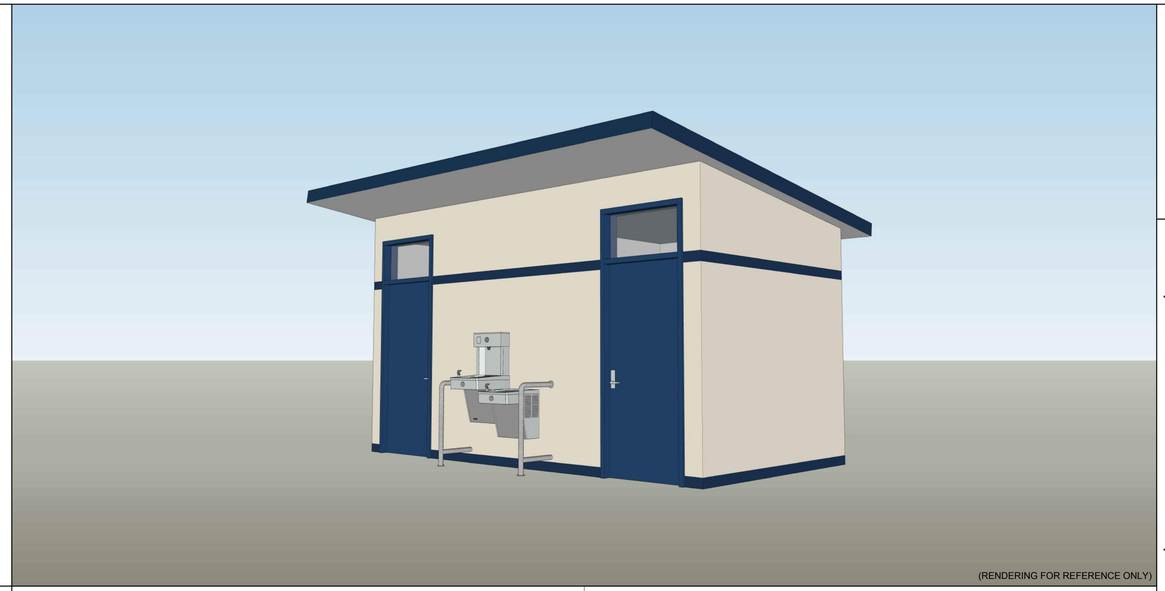
24285 LINCOLN ST. CHUALAR, CA 93925
CHUALAR UNION SCHOOL DISTRICT

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 01-122444 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 02/11/2026



VICINITY MAP

NOT TO SCALE



(RENDERING FOR REFERENCE ONLY)

PROJECT TEAM

OWNER:
CHUALAR UNION SCHOOL DISTRICT
24285 LINCOLN STREET,
CHUALAR, CA 93925
CONTACT: RUBEN PULIDO
OWNER: rpulido@chualarusd.org
PHONE: (831) 679-2504 x100

ARCHITECT:
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PHONE: (831) 424-4620

STRUCTURAL:
T & S STRUCTURAL
ADDRESS,
CITY
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PHONE: (831) 646-1383

CIVIL:
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AURUM CONSULTING ENGINEERS
60 GARDEN CT #210
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CONTACT: NAJIB ANWARY
EMAIL: najib@acemb.com
PHONE: (408) 564-7925

SHEET INDEX

TOTAL SHEETS: 45

T1.0 TITLE SHEET

** CIVIL

C1.1 NOTES LEGEND AND ABBREVIATIONS
C2.1 DEMOLITION PLAN
C2.2 DEMOLITION PLAN
C3.1 HORIZONTAL CONTROL PLAN
C3.2 HORIZONTAL CONTROL PLAN
C4.1 GRADING, DRAINAGE & UTILITY PLAN
C4.2 GRADING, DRAINAGE & UTILITY PLAN

ARCHITECTURAL

AF.1 OVERALL FIRE ACCESS SITE PLAN
A1.1 OVERALL SITE PLAN
A1.2 ENLARGED SITE PLAN
A1.3 ENLARGED SITE PLAN
A2.1 FLOOR PLAN, RCP, ROOF PLAN
A5.1 DOOR, WINDOW, FINISH SCHEDULE
A6.1 EXTERIOR ELEVATIONS & SECTION
A9.0 CODE COMPLIANCE AND SIGNAGE DETAILS
A9.1 SITE DETAILS
A9.2 SITE DETAILS
A9.6 EXTERIOR DETAILS

** STRUCTURAL

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S0.2 STRUCTURAL SPECIFICATIONS
S0.3 STRUCTURAL SPECIFICATIONS
S0.4 STRUCTURAL SPECIFICATIONS
S2.1 FOUNDATION & ROOF FRAMING PLAN
S3.1 STRUCTURAL DETAILS
S3.2 STRUCTURAL DETAILS
S3.3 STRUCTURAL DETAILS

** MECHANICAL/ PLUMBING

MP0.1 SYMBOLS, ABBREVIATIONS AND NOTES - MECHANICAL & PLUMBING
MP0.2 SCHEDULES - MECHANICAL & PLUMBING
MP2.1 FLOOR PLANS - MECHANICAL & PLUMBING
MP6.1 DETAILS - MECHANICAL & PLUMBING

** ELECTRICAL

E0.1 SYMBOLS, ABBREVIATIONS, GENERAL CONSTRUCTION NOTES, LIGHT FIXTURE SCHEDULE, CODES & SHEET INDEX.
E0.2 CALIFORNIA ENERGY COMPLIANCE TITLE 24 (BUILDING INTERIOR).
E0.3 CALIFORNIA ENERGY COMPLIANCE TITLE 24 (BUILDING EXTERIOR).
E1.1 ELECTRICAL SINGLE LINE DIAGRAM & PANELBOARD SCHEDULES.
E2.1 ELECTRICAL SITE PLAN.
E4.1 POWER, SYSTEMS & LIGHTING PLAN.
E6.1 ELECTRICAL DETAILS.

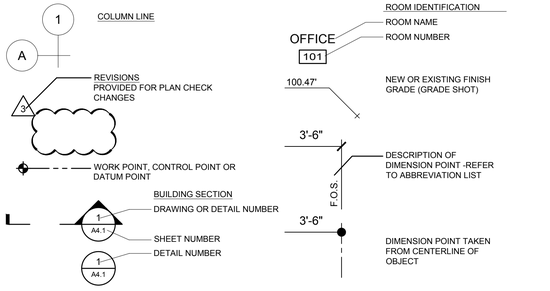
** FIRE ALARM

FA0.1 FIRE ALARM SYMBOLS, ABBREVIATIONS, EQUIPMENT LIST, OPERATIONAL MATRIX, DETAILS & NOTES.
FA1.1 FIRE ALARM RISER DIAGRAM.
FA2.1 FIRE ALARM SITE PLAN.
FA4.1 FIRE ALARM PLAN.

** LANDSCAPE

L-1.1 TRACK AND FIELD DEMOLITION PLAN
L-2.1 TRACK AND FIELD CONSTRUCTION PLAN
L-3.1 TRACK & FIELD CONSTRUCTION DETAILS

SYMBOLS



ABBREVIATIONS

(E)	EXISTING	EXT	EXTERIOR	NTS	NOT TO SCALE
(N)	NEW	FA	FIRE ALARM	OC	ON CENTER
AC	ASPHALTIC CONCRETE	FD	FLOOR DRAIN	OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
BLDG	BUILDING	FE	FIRE EXTINGUISHER		
BLK	BLOCK	FEC	FIRE EXTINGUISHER CABINET	OFOI	OWNER FURNISHED OWNER INSTALLED
BLKG	BLOCKING	FIN	FINISH		
BOT	BOTTOM	FL	FLOOR	PLAM	PLASTIC LAMINATE
BTWN	BETWEEN	FOF	FACE OF FINISH	PLYWD	PLYWOOD
CLG	CEILING	FT	FOOT OR FEET	PSI	POUNDS PER SQUARE INCH
CLR	CLEAR	GA	GAUGE	RD	ROOF DRAIN
COL	COLUMN	GALV	GALVANIZED	REQ	REQUIRED
CONC	CONCRETE	GYPBD	GYPSUM BOARD	RM	ROOM
CONT	CONTINUOUS	HDR	HEADER	RO	ROUGH OPENING
DBL	DOUBLE	HM	HOLLOW METAL	RR	RESTROOM
DEPT	DEPARTMENT	HR	HOUR	SF	SQUARE FEET
DIA	DIAMETER	IN	INCH	SIM	SIMILAR
DIM	DIMENSION	INT	INTERIOR	SPEC	SPECIFICATION
DS	DOWNSPOUT	LAV	LAVATORY	TYP	TYPICAL
DWG	DRAWING	MAX	MAXIMUM	UON	UNLESS OTHERWISE NOTED
EA	EACH	MECH	MECHANICAL	W/	W/ WITH
ELEC	ELECTRICAL	MIN	MINIMUM	WC	WATER CLOSET
EQ	EQUAL	MISC	MISCELLANEOUS	W/O	W/O WITHOUT
EW	EACH WAY	NIC	NOT IN CONTRACT		

SCOPE OF WORK

- REPLACE EXISTING SYNTHETIC TURF SOCCER FIELD AND RUBBERIZED WALKING TRACK.
- PROVIDE NEW ACCESSIBLE RESTROOM "BUILDING O" TO SERVE TRACK AND FIELD FACILITY.
- NEW GATES AND FENCING AT SCHOOL MAIN ENTRANCE

PROJECT DATA

1.	ASSESSORS PARCEL NUMBER:	145-031-003-000
2.	LOCATION:	24285 LINCOLN STREET, CHUALAR, CA 93925
3.	OWNER:	CHUALAR UNION SCHOOL DISTRICT
4.	ZONING:	PQP: PUBLIC QUASI PUBLIC
BUILDING Q:		
5.	OCCUPANCY GROUP:	E (TO REMAIN)
6.	CONSTRUCTION TYPE:	V-B
7.	NUMBER OF STORIES:	1 STORY
8.	BUILDING FIRE SPRINKLER SYSTEM:	NONE
9.	BUILDING AREA ADDED:	194

DSA NOTES

1. TITLE 24, PARTS 1-5 MUST BE KEPT ON THE SITE DURING CONSTRUCTION.
2. SUBSTITUTIONS AFFECTING DSA REGULATED ITEMS WILL BE CONSIDERED AS CHANGES TO APPROVED PLANS OR SPECIFICATIONS. THEY ARE TO BE TREATED AS ADDENDA OR CONSTRUCTION CHANGE DOCUMENTS, AND WILL REQUIRED DSA'S APPROVAL PRIOR TO FABRICATION AND INSTALLATION. (SEC. 4-338 (c), PART 1, TITLE 24, AND IR A-6).
3. ALL CONSTRUCTION CHANGE DOCUMENTS AND ADDENDA MUST BE STAMPED AND SIGNED BY A/E ON RECORD AND DELEGATED DESIGN PROFESSIONAL WHEN APPLICABLE, AND APPROVED BY DSA. (SEC. 4-338 (SEC. 4-338(b), PART 1, TITLE 24).
4. CHANGES TO THE STRUCTURAL, ACCESSIBILITY, OR FIRE AND LIFE SAFETY PORTIONS OF THE APPROVED PLANS AND SPECIFICATIONS SHALL BE MADE BY AN ADDENDUM OR CONSTRUCTION CHANGE DOCUMENT (CCD, DSA FORM 140) AND SHALL BE SUBMITTED TO AND APPROVED BY DSA PRIOR TO COMMENCEMENT OF THE WORK. CHANGES AFTER THE WORK HAS BEEN LET SHALL BE MADE BY A CONSTRUCTION CHANGE DOCUMENT AS REQUIRED IN SECTION 4-338, PART 1, TITLE 24, AND SHALL BE SUBMITTED TO AND APPROVED BY DSA PRIOR TO COMMENCEMENT OF THE WORK. ADDENDUMS AND CONSTRUCTION CHANGE DOCUMENTS SHALL BE PREPARED, STAMPED AND SIGNED BY THE ARCHITECT AND ENGINEERS IN RESPONSIBLE CHARGE AND SUBMITTED TO DSA IN COMPLIANCE WITH DSA INTERPRETATION OF REGULATION IR A-6.
5. SUPERVISION OF CONSTRUCTION BY DSA SHALL BE IN ACCORDANCE WITH SECTION 4-334, PART 1, TITLE 24.
6. DSA SHALL BE NOTIFIED AT THE START OF CONSTRUCTION AND PRIOR TO THE PLACEMENT OF THE CONCRETE PER SECTION 4-331, PART 1, TITLE 24.
7. CONTRACTOR, INSPECTOR, ARCHITECT AND ENGINEERS SHALL SUBMIT VERIFIED REPORTS (FORM DSA-6) IN ACCORDANCE WITH SECTION 4-336 AND 4-343, PART 1, TITLE 24.
8. GRADING PLANS, DRAINAGE IMPROVEMENT, ROAD AND ACCESS REQUIREMENTS AND ENVIRONMENTAL HEALTH CONCERNS SHALL COMPLY WITH ALL LOCAL ORDINANCES.
9. PRIOR TO OCCUPANCY OF ANY BUILDING THE FIRE ALARM SYSTEM SHALL BE TESTED AND ACCEPTED BY THE LOCAL FIRE AUTHORITY.
10. CONTRACTOR, INSPECTOR, ARCHITECT, AND ENGINEERS SHALL SUBMIT VERIFIED REPORTS IN ACCORDANCE WITH SECTION 4-336 AND 4-343, PART 1, TITLE 24.

DSA ADMINISTRATIVE REQUIREMENTS (PARTIAL LISTING ONLY)

1. ALL TESTS TO CONFORM TO THE REQUIREMENTS OF SECTION 4-335, PART 1, TITLE 24, AND APPROVED TESTS & INSPECTION SHEET.
2. TESTS OF MATERIALS AND TESTING LABORATORY SHALL BE IN ACCORDANCE WITH SECTION 4-335, PART 1, TITLE 24 AND THE DISTRICT SHALL EMPLOY AND PAY THE LABORATORY. COSTS OF RE-TEST MAY BE BACK CHARGED TO THE CONTRACTOR.
3. PROJECT INSPECTOR EMPLOYED BY THE DISTRICT SHALL BE APPROVED BY DSA. INSPECTION SHALL BE CLASS 1. PROJECT INSPECTOR IN ACCORDANCE WITH SECTION 4-333(b). THE DUTY OF THE PROJECT INSPECTOR SHALL BE IN ACCORDANCE WITH SECTION 4-342, PART 1, TITLE 24.
4. A DSA ACCEPTED TESTING LABORATORY DIRECTLY EMPLOYED BY THE DISTRICT (OWNER) SHALL CONDUCT ALL THE REQUIRED TESTS AND SPECIFICATIONS FOR THE PROJECT.

CODES

2022 CALIFORNIA ADMINISTRATIVE CODE (CAC); PART 1, TITLE 24, C.C.R.
2022 CALIFORNIA BUILDING CODE (CBC); PART 2, TITLE 24, C.C.R.
2022 CALIFORNIA ELECTRICAL CODE (CEC); PART 3, TITLE 24, C.C.R.
2022 CALIFORNIA MECHANICAL CODE (CMC); PART 4, TITLE 24, C.C.R.
2022 CALIFORNIA PLUMBING CODE (CPC); PART 5, TITLE 24, C.C.R.
2022 CALIFORNIA ENERGY CODE; PART 6, TITLE 24. C.C.R.
2022 CALIFORNIA FIRE CODE (CFC); PART 9, TITLE 24, C.C.R.
2022 CALIFORNIA GREEN BUILDING STANDARDS CODE (CALGREEN); PART 11, TITLE 24 C.C.R.
2022 CALIFORNIA REFERENCE STANDARDS CODE; PART 12, TITLE 24, C.C.R.
TITLE 19 C.C.R., PUBLIC SAFETY, STATE FIRE MARSHAL REGULATIONS

APPLICABLE STANDARDS
FOR A LIST OF APPLICABLE STANDARDS, INCLUDING CALIFORNIA AMENDMENTS TO THE NFPA STANDARDS, REFER TO CBC CHAPTER 35 AND CFC CHAPTER 80.

ALL CONSTRUCTION AND DEMOLITION SHALL BE IN ACCORDANCE WITH CHAPTER 33 OF THE CBC AND CFC, AND THE WRITTEN SITE FIRE SAFETY PLAN.

STATEMENT OF GENERAL CONFORMANCE

FOR ARCHITECTS/ENGINEERS WHO UTILIZE PLANS INCLUDING BUT NOT LIMITED TO SHOW DRAWINGS, PREPARED BY OTHER LICENSED DESIGN PROFESSIONALS AND/OR CONSULTANTS.

(APPLICATION No. 01-122444 FILE No. 27-13)

** SHEETS: SEE SHEET INDEX

HAVE BEEN PREPARED BY OTHER DESIGN PROFESSIONALS OR CONSULTANTS WHO ARE LICENSED AND/OR AUTHORIZED TO PREPARE SUCH DRAWINGS IN THIS STATE. IT HAS BEEN EXAMINED BY ME FOR:

1. DESIGN INTENT AND APPEARS TO MEET THE APPROPRIATE REQUIREMENTS OF TITLE 24, CALIFORNIA CODE OF REGULATIONS AND THE PROJECT SPECIFICATIONS PREPARED BY ME, AND
2. COORDINATION WITH MY PLANS AND SPECIFICATIONS AND IS ACCEPTABLE FOR INCORPORATION INTO THE CONSTRUCTION OF THIS PROJECT.

THE STATEMENT OF GENERAL CONFORMANCE "SHALL NOT BE CONSTRUED AS RELIEVING ME OF MY RIGHTS, DUTIES, AND RESPONSIBILITIES UNDER SECTIONS 17302 AND 81138 OF THE EDUCATION CODE AND SECTIONS 4-336, 4-341 AND 4-344" OF TITLE 24, PART 1. (TITLE 24, PART 1, SECTION 4-317 (B)).

I CERTIFY THAT:
☒ ALL DRAWINGS OR SHEETS LISTED ON THE COVER OR INDEX SHEET
☒ THIS DRAWING OR PAGE
☒ IS/ARE IN GENERAL CONFORMANCE WITH THE PROJECT DESIGN, AND
☒ HAS/HAVE BEEN COORDINATED WITH THE PROJECT PLANS AND SPECIFICATIONS

ARCHITECT OR ENGINEER DESIGNATED TO BE IN GENERAL RESPONSIBLE CHARGE:

DAVID PEARTREE, LIC. Ç-30852, EXP.: 12/31/2027

SIGNATURE 01/20/2026 DATE

Peartree+Belli
ARCHITECTS
235 MONTEREY ST., SUITE B
SALINAS, CA 93901
(831) 424-4620
PEARTREEBELLI.COM

LICENSED ARCHITECT
DAVID PEARTREE
C-30852
Exp. 12/31/27
STATE OF CALIFORNIA

REV.	DATE	DESCRIPTION
	06/23/25	1ST PLAN CHECK SUBMITTAL
	10/24/25	1ST PLAN CHECK RE-SUBMITTAL
	01/28/26	2ND BACK CHECK RE-SUBMITTAL

DATE: 05/15/2025
SCALE: AS NOTED
DRAWN: AT
JOB: 24033
SHEET: T1.0

TITLE SHEET
TRACK + FIELD REPLACEMENT AND NEW RESTROOM BUILDING FOR:
CHUALAR UNION E.S.
24285 LINCOLN ST. CHUALAR, CA 93925
CHUALAR UNION SCHOOL DISTRICT

THE USE OF THESE PLANS AND SPECIFICATIONS SHALL BE RESTRICTED TO THE ORIGINAL SITE FOR WHICH THEY WERE PREPARED AND PUBLICATION THEREOF IS EXPRESSLY LIMITED TO SUCH USE. REUSE, REPRODUCTION OR PUBLICATION BY ANY METHOD, IN WHOLE OR IN PART, IS PROHIBITED. TITLE TO THE PLANS AND SPECIFICATIONS REMAINS WITH THE ARCHITECT, AND VISUAL CONTACT WITH THEM CONSTITUTES PRIMA FACIE EVIDENCE OF THE ACCEPTANCE OF THESE RESTRICTIONS.

GENERAL NOTES

1. All work shall be done in accordance with the following:
   a) Applicable sections of the State of California Department of Transportation Standard Specifications, latest edition, hereinafter called "Caltrans";
   b) California Plumbing Code and California Building Code Provisions
   c) AWWA standards and specifications;
   d) City of Chualar Standard Details and Specifications where applicable;
   e) These plans and details shown hereon;
   f) Standards of the United States Department of Labor, Occupational Safety and Health Administration, Office of Standards and rules of the State Division of Industrial Safety.
   g) Latest edition of the California State Code of Regulations Title 24.
   h) The Project Specifications
   i) Soils Investigation prepared by Earth Systems Pacific entitled "Chualar Elementary School Turf Replacement, 24285 Lincoln Street, Chualar, Monterey County, California", dated August 20, 2015. File No. SH-12845-SA

Where conflicts exist between any of the above listed specifications, the most stringent listed specification shall prevail.

2. It is the responsibility of the Contractor to secure all permits necessary to perform the work, including but not limited to, work in the public right-of-way, grading, tree removal, and utility modifications.

3. Contractor shall supply all equipment, labor, and materials necessary to perform the work shown on this plan.

4. It shall be the responsibility of the various contractors to coordinate their work so as to eliminate conflicts and work toward the general good and completion of the entire project.

5. All workmanship and materials furnished by Contractor shall be of the kind and quality described in the specifications and shall be first class throughout. Neither final acceptance nor final payment by Owner shall relieve the Contractor of responsibility for faulty materials or workmanship.

6. In the event of any conflict of information shown in these plans or any conflict between these plans and the intent of a consistent and functional product, the Contractor shall so notify the Owner in writing, upon which notice the Owner shall resolve the conflict by the issuance of a written order, revised plans or both. The Contractor shall bear full cost and responsibility for work affected by such conflicts and performed by Contractor prior to such notice to the Owner and issuance of such order and/or revised plans.

7. Contractor shall provide adequate dust control at all times as required by Owner's representative.

8. Contractor shall exercise all necessary caution to avoid damage to any existing trees, or surface improvements, or to any existing drainage structure, water structures, sewer cleanouts, manholes, or junction boxes for underground electric, telephone, or cable TV, or storm sewer, sanitary sewer, water line, and underground utilities, which are to remain in place and shall bear full responsibility for any damage thereto.

9. All known existing utility lines are shown for information only. Contractor shall exercise all necessary caution to avoid damage to any existing utility lines or facilities to remain in place, whether or not such lines or facilities are shown on these plans, and shall bear full responsibility for any damage thereto. Contractor is advised to Contact Underground Service Alert (USA) at 811 or a private Underground Locater Service (at contractor's expense) and the affected utility company for marking underground lines prior to beginning work.

10. Inspection of work: Contractor shall notify the Owner's representative forty eight (48) hours prior to any work.

11. Engineer shall have no responsibility for Contractor's work methods and procedures, jobsite conditions, jobsite safety or adherence to safety procedures and requirements.

12. The Contractor agrees that, in accordance with generally accepted construction practices, the Contractor will be required to assume sole and complete responsibility for jobsite conditions during the course of construction of the project, including safety of all persons and property. This requirement shall apply continuously and not be limited to normal working hours. The contractor agrees to defend, indemnify and hold Owner and Engineer harmless from any and all liability, real or alleged, in connection with the performance of the work on this project, exempting liability arising from the sole negligence of the Engineer or Owner.

13. Contractor shall provide appropriate traffic control measures as outlined in the City of Chualar specifications and as directed by the City Engineer.

14. Contractor shall use Best Management Practices (BMPs) consistent with CASQA and local jurisdiction requirements.

15. Existing accessible routes and accessible parking serving facilities and buildings that are operational during construction shall remain unobstructed, save and useable by people with disabilities.

UNDERGROUND NOTES

1. Contractor shall expose and verify location and elevation of existing utilities, including sanitary and storm sewers, and water lines before constructing new facilities. Contractor shall cap existing irrigation lines where necessary so that the remaining irrigation system will continue to be operational for the existing landscaping to remain.

2. Materials for pipe, storm water inlets and cleanouts and installation procedures shall be in accordance with applicable California Building Code sections and the City of Chualar Standard Specifications, the Project Specifications and these plans and details shown hereon.

3. Ensure grates are ADA compliant for all existing inlets to remain in travelled access paths, subject to pedestrian traffic. Replace as necessary.

4. All trench excavation and backfill for sewer lines shall conform to requirements of the City of Chualar Standard Specifications. Jetting of backfill materials to achieve compaction is not allowed.

5. All trenches and excavations shall be constructed in strict compliance with the applicable sections of California and Federal O.S.H.A. requirements and other applicable safety ordinances. Contractor shall bear full responsibility for trench shoring design and installation.

6. Materials for pipe and installation requirements for domestic water lines shall be in accordance with applicable California Plumbing Code sections, the City of Chualar Standard Specifications, and these plans and details shown hereon.

GRADING AND PAVING NOTES

1. Work shall consist of all clearing, grubbing, and stripping, preparation of land to be filled, excavation, spreading, compaction and control of the fill, and all subsidiary work necessary to complete the grading to conform to the lines, grades and slopes, as shown on the accepted plans and as specified in the Geotechnical Investigation Report.

2. The contractor's attention is directed to the Geotechnical Investigation prepared by Earth Systems Pacific entitled "Chualar Elementary School Turf Replacement, 24285 Lincoln Street, Chualar, Monterey County, California", dated August 20, 2015. File No. SH-12845-SA

3. The Contractor shall notify the Soil Engineer, Earth Systems Pacific Phone: 831-422-8547 and the Owner's representative, at least forty-eight (48) hours prior to commencement of any grading operations on-site.

4. A representative of the Soils Engineer shall be on site during grading operations and shall perform such testing as deemed necessary. The representative shall observe the grading operation for conditions that should be corrected, and identify those conditions with recommended corrective measures to the Contractor.

5. In the event that any unusual conditions not covered by these notes and the Soils Investigation are encountered during grading operations, the Soils Engineer shall be immediately notified for recommendations.

6. All existing trash, debris, roots, tree remains and other rubbish shall be removed from the site so as to leave the areas that have been disturbed with a neat and finished appearance free from unsightly debris. No burning shall be permitted.

7. Contractor shall grade to the line and elevations shown on the plan within the following horizontal and vertical tolerance, in the areas indicated:

	Horizontal	Vertical
a. Building Pad Subgrade	0.50'+	0.05'+
b. Area subgrade preparation	0.05'+	0.05'+

Compaction of subgrade materials shall extend a minimum of five (5) feet beyond building limits and three (3) feet beyond pavement, walkway, and curb and gutter limits.

8. All aggregate base material and the handling and placement thereof shall be in accordance with the Caltrans Standard Specifications. Aggregate base materials shall be Class II.

9. Compacted building pads shall extend 5 feet minimum beyond building footprint.

10. Asphalt concrete (AC) shall be Type B, 3/4" maximum aggregate size for base course and 1/2" maximum aggregate size for surface course, as specified for surface course material in the Caltrans Specification. 2" thickness may be placed in one lift.

11. SC-70 liquid asphalt prime coat conforming to the provisions of the Caltrans Specifications shall be applied at the rate of 0.15+ gallons per square yard to surface of aggregate base prior to placement of asphalt concrete.

12. SS-1 emulsified asphalt paint binder conforming to the provisions of the Caltrans Specification shall be applied at the rate of 0.07+ gallons per square yard to existing asphalt concrete surface and vertical concrete surfaces to receive asphalt concrete.

13. SS-1 emulsified liquid asphalt seal coat conforming to the provisions of the Caltrans Specifications shall be diluted with equal parts water and applied at the rate of 0.15+ gallons per square yard to surface of the new finished asphalt paving surface and existing asphalt paving surfaces to remain in place. Existing asphalt surfaces shall be cleaned prior to seal coat operation.

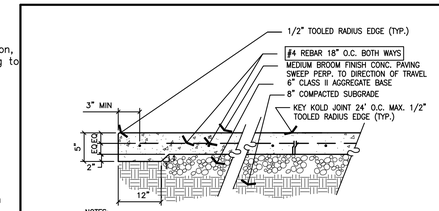
14. Contractor shall adjust all inlets, valve boxes, manhole rims, and sewer cleanouts to new finish grade.

15. Materials handling and placement of Portland Cement Concrete shall be in accordance with applicable sections of the Caltrans Standard Specifications and these plans and details shown hereon.

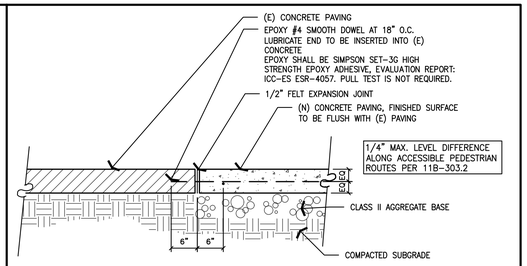
LEGEND

DESCRIPTION	DETAIL	PROPOSED	EXISTING
PROPERTY LINE			
CENTERLINE			
AC PAVEMENT			
CURB & GUTTER			
VERTICAL CURB	3 / C1.1		
SIDEWALK	1 / C1.1 and 2 / C1.1		
ACCESSIBLE RAMP			
STORM DRAIN INLET			
FIRE HYDRANT			
ELECTROLIER			
SANITARY SEWER			SS
STORM DRAIN			SD
WATER LINE			W
DIRECTION & RATE OF SLOPE		1.5%	
SWALE			
FENCE			X
EDGE OF PAVEMENT			
CONTOUR			

1 / C1.1 — DETAIL NUMBER; SHEET UPON WHICH DETAIL APPEARS



1 CONCRETE SIDEWALK NOT TO SCALE



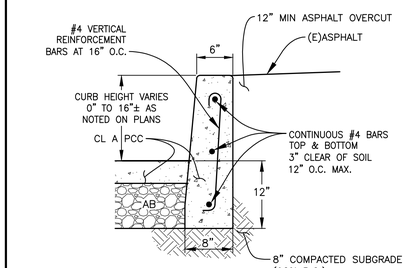
NOT TO SCALE

2 CONCRETE TO EX. CONCRETE CONNECTION

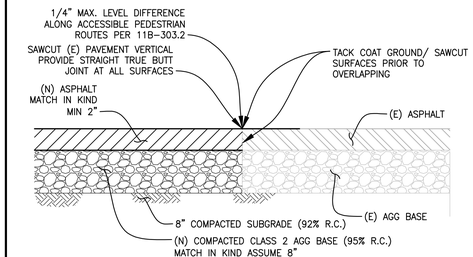
ABBREVIATIONS

NOTE: NOT ALL ABBREVIATIONS MAY BE USED FOR ALL PROJECTS

AB	AGGREGATE BASE	ML	MONUMENT LINE
AC	ASPHALT CONCRETE	(N)	NEW (PROPOSED)
ACC	ACCESSIBLE	O.C.	ON CENTER
ARCH	ARCHITECTURAL	OFG	OUTSIDE FINISH GRADE
BOS	BOTTOM OF STEP ELEVATION	P	PAVEMENT SURFACE ELEVATION
BR	BOTTOM OF RAMP	PERF	PERFORATED
BS	BOTTOM OF STEP ELEVATION	PP	POWER POLE
BSM	BIORETENTION SOIL MIX	PL	PROPERTY LINE
BTM	BOTTOM OF SLOPE	PSD	PERFORATED STORM DRAIN
BW	BACK OF WALK ELEVATION	(RD)	RECORD DOCUMENT
BOW	BOTTOM OF WALL ELEVATIONS	REINF	REINFORCED
CB	CATCH BASIN	RIM	RIM ELEVATION
CI	CAST IRON	RS	RAT SLAB
CL	CENTER LINE	RWL	RAIN WATER LEADER
C&G	CURB AND GUTTER	S=	SLOPE
DIA	DIAMETER	S.A.D.	SEE ARCHITECTURAL DRAWINGS
DS	DOWNSPOUT	SD	STORM DRAIN
DW	DOMESTIC WATER	S.E.D.	SEE ELECTRICAL DRAWINGS
DWY	DRIVEWAY	SL	STREET LIGHT
E	ELECTRICAL	S.L.D.	SEE LANDSCAPE DRAWINGS
(E)	EXISTING	SOV	SHUT-OFF VALVE
EB	ELECTRICAL BOX	SS	SANITARY SEWER
EP	EDGE OF PAVEMENT	SSCO	SANITARY SEWER CLEANOUT
ETW	EDGE OF TRAVELED WAY	STD	STANDARD
EV	ELECTRICAL VAULT	S/W	SIDEWALK
FNC	FENCE	STLT	STREET LIGHT
FH	FIRE HYDRANT	T	TELEPHONE
FF	FINISHED FLOOR ELEVATION	TOB	TOP OF BANK
FL	FLOW LINE	TOE	TOE OF BANK
FOC	FACE OF CURB	TOP	TOP OF SLOPE
G	GAS	TC	TOP OF CURB
GB	GRADE BREAK	TOS	TOP OF STEP ELEVATION
GND	GROUND ELEVATION	TOW	TOP OF WALL ELEVATION
HC	ACCESSIBLE	TP	TELEPHONE POLE
HORIZ	HORIZONTAL	TR	TOP OF RAMP
JP	JOINT POLE	TS	TOP OF STEP ELEVATION
ICV	IRRIGATION CONTROL VALVE	TSB	TRAFFIC SIGNAL BOX
INV	INVERT	TYP	TYPICAL
LF	LINEAR FEET	VERT	VERTICAL
LS	LANDSCAPE	VLT	VAULT
MAX	MAXIMUM	W	WATER
(ME)	MATCH EXISTING ELEVATION	WV	WATER VALVE
MH	MANHOLE		
MIN	MINIMUM		



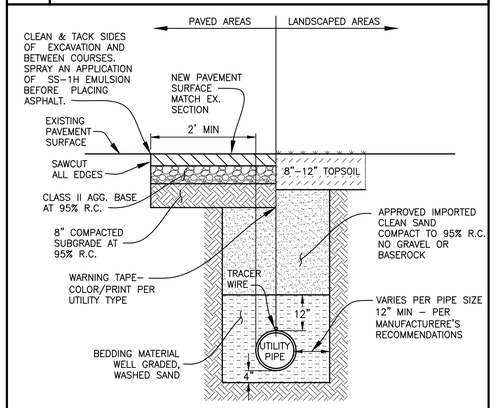
3 VERTICAL CURB NOT TO SCALE



(N) ASPHALT TO (E) ASPHALT CONNECTION

NOT TO SCALE

4 AC PAVEMENT SECTION & CONNECTION



TYPICAL TRENCH SECTION NOT TO SCALE

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 01-122444 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 02/11/2026

Peartree+Belli ARCHITECTS
235 MONTEREY ST., SUITE B
SALINAS, CA 93901
(831) 424-4620
PEARTREEBELLI.COM

CARROLL ENGINEERING
civil engineers and surveyors
1101 S. WINCHESTER BLVD.
SUITE 110
SAN JOSE, CA 95128
PHONE: 408-296-6300
FAX: 408-281-2585
EMAIL: Robert@carroll-engineering.com

REGISTERED PROFESSIONAL ENGINEER ROBERT V. FERGUSON No. 60493 Exp. 6/30/26 CIVIL STATE OF CALIFORNIA
10/24/25

REV.	DATE	DESCRIPTION
	09/23/25	1ST PLAN CHECK SUBMITTAL
	10/24/25	1ST PLAN CHECK RE-SUBMITTAL

DATE: 10/24/2025
SCALE: AS NOTED
DRAWN: STAFF
JOB: 24033 CEI PROJ NO. 3123
SHEET: C1.1
DSA Backcheck

NOTES, LEGEND, & ABBREVIATIONS

SOCCER FIELD + TRACK REPLACEMENT AND NEW RESTROOM BUILDING FOR:

CHUALAR UNION E.S.

24285 LINCOLN ST. CHUALAR, CA 93925
CHUALAR UNION SCHOOL DISTRICT

Construction Contractor agrees that in accordance with generally accepted construction practices, construction contractor will be required to assume sole and complete responsibility for job site conditions during the course of construction of the project, including safety of all persons and property; that this requirement shall be made to apply continuously and not be limited to normal working hours, and construction contractor further agrees to defend, indemnify and hold design professional harmless from any and all liability, real or alleged in connection with the performance of work on this project, excepting liability arising from the sole negligence of design professional.

THE USE OF THESE PLANS AND SPECIFICATIONS SHALL BE RESTRICTED TO THE ORIGINAL SITE FOR WHICH THEY WERE PREPARED AND PUBLICATION THEREOF IS EXPRESSLY LIMITED TO SUCH USE. REUSE, REPRODUCTION, OR PUBLICATION BY ANY METHOD, IN WHOLE OR IN PART, IS PROHIBITED. TITLE TO THE PLANS AND SPECIFICATIONS REMAINS WITH THE ARCHITECT AND VISUAL CONTACT WITH THESE CONSTITUTES PRIMA FACIE EVIDENCE OF THE ACCEPTANCE OF THESE RESTRICTIONS.

UNAUTHORIZED CHANGES & USES: The engineer preparing these plans will not be responsible for, or liable for, unauthorized changes to or uses of these plans. All changes to the plans must be in writing and must be approved by the preparer of these plans.

O:\3123 - Chualar ES Field_DWG\3123-C1 NLD.dwg 10-21-25 04:

Construction Contractor agrees that in accordance with generally accepted construction practices, construction contractor will be required to assume sole and complete responsibility for job site conditions during the course of construction of the project including safety of all persons and property; that this requirement shall be made to apply continuously and not be limited to normal working hours, and construction contractor further agrees to defend, indemnify and hold design professional harmless from any and all liability, real or alleged in connection with the performance of work on this project, excepting liability arising from the sole negligence of design professional.

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 01-122444 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 02/11/2026

Peartree+Belli
ARCHITECTS
235 MONTEREY ST., SUITE B
SALINAS, CA 93901
(831) 424-4620
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CARROLL ENGINEERING
civil engineers and surveyors
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SAN JOSE, CA 95128
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FAX: 408-296-8293
EMAIL: RobertV@carroll-engineering.com

REGISTERED PROFESSIONAL ENGINEER
ROBERT V. HANVELT
No. 60493
Exp. 6/30/26
CIVIL
STATE OF CALIFORNIA
10/24/25

DEMOLITION PLAN

SOCCER FIELD + TRACK REPLACEMENT AND NEW RESTROOM BUILDING FOR:

CHUALAR UNION E.S.

24285 LINCOLN ST. CHUALAR, CA 93925
CHUALAR UNION SCHOOL DISTRICT

REV.	DATE	DESCRIPTION
	06/23/25	1ST PLAN CHECK SUBMITTAL
	10/24/25	1ST PLAN CHECK RE-SUBMITTAL

DATE: 10/24/2025
SCALE: AS NOTED
DRAWN: STAFF
JOB: 24033 (EC PROJ NO. 3123)
SHEET: C2.1
DSA Backcheck

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CHUALAR RD.
(A COUNTY RD. - 45' WIDE)

PAYSON ST.
(A COUNTY RD. – 100' WIDE)

LINCOLN ST.
(A COUNTY RD. – 100' WIDE)

SCOTT ST.
(A COUNTY RD. – 100' WIDE)

SEE SHEET C2.2 FOR CONTINUATION

MATCHLINE

LEGEND

1. WALKING TRACK TO BE REMOVED
   REFER TO L1-1 FOR ADDITIONAL SCOPE CLARIFICATION
2. SYNTHETIC TURF TO BE REMOVED
   REFER TO L1-1 FOR ADDITIONAL SCOPE CLARIFICATION
3. SHRUBS AND/OR LANDSCAPING TO BE REMOVED
4. CONCRETE TO BE REMOVED
5. SAWCUT PAVEMENT
   SEE SHEETS C4.1 AND C4.2 FOR EXACT LIMITS
6. PAVING TO BE REMOVED
7. FENCE TO BE REMOVED & REPLACED IN KIND AS NEEDED
8. CURB AND/OR WALL TO BE REMOVED INCLUDING FOOTING AND BASE ROCK

X TREE TO BE REMOVED
NOTE: ALL OTHER TREES TO REMAIN UNLESS NOTED OTHERWISE

NOTES:

1. THE LIMITS OF DEMOLITION SHOWN HEREON ARE TO PROVIDE THE CONTRACTOR WITH A GENERAL SCOPE OF WORK. PRECISE LIMITS OF PAVEMENT REMOVAL AND GRADING SHOULD BE TAKEN FROM THE GRADING AND DRAINAGE PLAN. THE CONTRACTOR SHOULD ALSO REFERENCE LANDSCAPE ARCHITECT PLANS, ARCHITECTURAL PLANS, AND THE CONSTRUCTION DOCUMENTS FOR A COMPLETE SCOPE OF WORK. (VERIFY ALL DEMOLITION WITH THE SCHOOL DISTRICT).
2. DEMOLITION WORK SHALL CONFORM TO CAL GREEN CODE SECTIONS 5.408.3 (CONSTRUCTION WASTE REDUCTION BY AT LEAST 50%) AND 5.408..4 (EXCAVATED SOIL AND LAND CLEARING DEBRIS), AND LOCAL CONSTRUCTION WASTE MANAGEMENT REQUIREMENTS. THE MOST STRINGENT CODE SHALL PREVAIL.
3. ALL SIGNS, POSTS, AND FOOTINGS TO BE REMOVED WITHIN THE LIMITS OF DEMOLITION UNLESS NOTED OTHERWISE.
4. REFER TO ORIGINAL DESIGN DRAWINGS, AVAILABLE FROM DISTRICT, FOR EXISTING BUILDINGS (FOOTINGS, MATERIALS, ETC.).
5. EXISTING TURF TO REMAIN. LANDSCAPE CONTRACTOR TO COORDINATE WITH GENERAL CONTRACTOR IF REPLACEMENT IS REQUIRED DUE TO STAGING, CONSTRUCTION ACCESS, OR CONSTRUCTION ACTIVITY. REPAIR WITH SOD TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE. TURF AREAS FENCED DURING CONSTRUCTION SHALL BE MAINTAINED (MOWED, WATERED, AND FERTILIZED) BY CONTRACTOR. WHERE NEW SOD IS INSTALLED, SHOVEL CUT EDGE OF EXISTING TURF VERTICAL AND STRAIGHT, AMEND SOIL AND GRADE TO RECEIVE NEW SOD FLUSH WITH EXISTING EDGES. DO NOT SCALE SOD REPAIR FROM THIS DRAWING, INCLUDE A MINIMUM OF 6,000 SF OF SOD REPAIR. COORDINATE WITH GENERAL CONTRACTOR FOR EXTENT OF REPAIR REQUIRED TO RESTORE TURF DUE TO CONSTRUCTION ACTIVITY

20 0 20 40
(IN FEET)
1 inch = 20 ft.
GRAPHIC SCALE

UNAUTHORIZED CHANGES & USES: The engineer preparing these plans will not be responsible for, or liable for, unauthorized changes to or uses of these plans. All changes to the plans must be in writing and must be approved by the preparer of these plans.

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SEE SHEET C1.2 FOR CONTINUATION

MATCHLINE

LEGEND

1. WALKING TRACK TO BE REMOVED
   REFER TO L1-1 FOR ADDITIONAL SCOPE CLARIFICATION
2. SYNTHETIC TURF TO BE REMOVED
   REFER TO L1-1 FOR ADDITIONAL SCOPE CLARIFICATION
3. SHRUBS AND/OR LANDSCAPING TO BE REMOVED
4. CONCRETE TO BE REMOVED
5. SAWCUT PAVEMENT
   SEE SHEETS C4.1 AND C4.2 FOR EXACT LIMITS
6. PAVING TO BE REMOVED
7. FENCE TO BE REMOVED & REPLACED IN KIND AS NEEDED
8. CURB AND/OR WALL TO BE REMOVED INCLUDING FOOTING AND BASE ROCK

X TREE TO BE REMOVED
NOTE: ALL OTHER TREES TO REMAIN UNLESS NOTED OTHERWISE

BLDG M
RELOCATABLE
CHILDCARE
DSA NO. 01-104586

BLDG C
(E) CLASSROOMS
DSA NO. 42415

BLDG B
(E) CLASSROOMS AND RESTROOMS
DSA NO. 5301

BLDG D
(E) CLASSROOMS
AND RESTROOMS
DSA NO. 42415

BLDG A
(E) CLASSROOMS
DSA NO. 42415

HEAD START
(E) RELOCATABLE
CLASSROOMS
DSA NOS. 69197, 69198, 60615

BLDG G
(E) CLASSROOMS
DSA NO. 60615

(E) GYMNASIUM
AND FOOD SERVICE
DSA NO. 01-105262

(E) PUMP HOUSE

(E) STORAGE

(E) STORAGE

SIGN TO BE REMOVED

TREE TO BE REMOVED

FLAG POLE AND SIGN TO REMAIN

NOTES:

1. THE LIMITS OF DEMOLITION SHOWN HEREON ARE TO PROVIDE THE CONTRACTOR WITH A GENERAL SCOPE OF WORK. PRECISE LIMITS OF PAVEMENT REMOVAL AND GRADING SHOULD BE TAKEN FROM THE GRADING AND DRAINAGE PLAN. THE CONTRACTOR SHOULD ALSO REFERENCE LANDSCAPE ARCHITECT PLANS, ARCHITECTURAL PLANS, AND THE CONSTRUCTION DOCUMENTS FOR A COMPLETE SCOPE OF WORK. (VERIFY ALL DEMOLITION WITH THE SCHOOL DISTRICT).

2. DEMOLITION WORK SHALL CONFORM TO CAL GREEN CODE SECTIONS 5.408.3 (CONSTRUCTION WASTE REDUCTION BY AT LEAST 50%) AND 5.408..4 (EXCAVATED SOIL AND LAND CLEARING DEBRIS), AND LOCAL CONSTRUCTION WASTE MANAGEMENT REQUIREMENTS. THE MOST STRINGENT CODE SHALL PREVAIL.

3. ALL SIGNS, POSTS, AND FOOTINGS TO BE REMOVED WITHIN THE LIMITS OF DEMOLITION UNLESS NOTED OTHERWISE.

4. REFER TO ORIGINAL DESIGN DRAWINGS, AVAILABLE FROM DISTRICT, FOR EXISTING BUILDINGS (FOOTINGS, MATERIALS, ETC.).

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20 0 20 40
(IN FEET)
1 inch = 20 ft.
GRAPHIC SCALE

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 01-122444 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 02/11/2026

Peartree+Belli
ARCHITECTS
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SALINAS, CA 93901
(831) 424-4620
PEARTREEBELLI.COM

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FAX: 408-281-2585
EMAIL: RVH@carroll-engineering.com

REGISTERED PROFESSIONAL ENGINEER
ROBERT V. HANEY-FEVER
No. 60493
Exp. 6/30/26
CIVIL
STATE OF CALIFORNIA
10/24/25

DEMOLITION PLAN
SOCCER FIELD + TRACK REPLACEMENT AND NEW RESTROOM BUILDING FOR:
CHUALAR UNION E.S.
24285 LINCOLN ST. CHUALAR, CA 93925
CHUALAR UNION SCHOOL DISTRICT

REV.	DATE	DESCRIPTION
	06/23/25	1ST PLAN CHECK SUBMITTAL
	10/24/25	1ST PLAN CHECK RE-SUBMITTAL

DATE: 10/24/2025
SCALE: AS NOTED
DRAWN: STAFF
JOB: 24033
OB PROJ NO. 3123
SHEET: C2.2
DSA Backcheck

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DATE: 02/11/2026

Peartree+Belli
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surveyors and engineers
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SUITE H-2065
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FAX: 408-296-8833
PHONE: 408-261-2565
E-MAIL: RichCarroll@carroll-engineering.com

REGISTERED PROFESSIONAL ENGINEER
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CIVIL
STATE OF CALIFORNIA
10/24/25

HORIZONTAL CONTROL PLAN

SOCCER FIELD + TRACK REPLACEMENT AND NEW RESTROOM BUILDING FOR:

CHUALAR UNION E.S.

24285 LINCOLN ST. CHUALAR, CA 93925
CHUALAR UNION SCHOOL DISTRICT

REV.	DATE	DESCRIPTION
	08/23/25	1ST PLAN CHECK SUBMITTAL
	10/24/25	1ST PLAN CHECK RE-SUBMITTAL

DATE: 10/24/2025
SCALE: AS NOTED
DRAWN: STAFF
JOB: 24033
CE PROJ NO. 3123
SHEET:

C3.1
DSA Backcheck

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C:\Users\renee\appdata\local\temp\AcPublish_1532\3123-C3 Horizon

SEE SHEET C3.1 FOR CONTINUATION

MATCHLINE

BLDG M
RELOCATABLE
CHILDCARE
DSA NO. 01-104586

(E) PUMP HOUSE

(E) STORAGE

BLDG B
(E) CLASSROOMS AND RESTROOMS
DSA NO. 5301

BLDG C
(E) CLASSROOMS
DSA NO. 42415

BLDG D
(E) CLASSROOMS
AND RESTROOMS
DSA NO. 42415

BLDG A
(E) CLASSROOMS
DSA NO. 42415

HEAD START
(E) RELOCATABLE
CLASSROOMS
DSA NOS.
69197, 69198, 60615

BLDG G
(E) CLASSROOMS

(E) STORAGE

(E) GYMNASIUM
AND FOOD SERVICE
DSA NO. 01-105262

5.0' MIN
5.0' MIN
5.0' MIN
13.0'
13.0'
26.0'
10.0'
135°0'
135°0'
34.5'

20 0 20 40
(IN FEET)
1 inch = 20 ft.
GRAPHIC SCALE

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(831) 424-4620
PEARTREEBELLI.COM

CARROLL ENGINEERING
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FAX: 408-261-2595
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STATE OF CALIFORNIA
10/24/25

HORIZONTAL CONTROL PLAN

SOCCER FIELD + TRACK REPLACEMENT AND NEW RESTROOM BUILDING FOR:

CHUALAR UNION E.S.

24285 LINCOLN ST. CHUALAR, CA 93925
CHUALAR UNION SCHOOL DISTRICT

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DRAWN: STAFF
JOB: 24033 DEI PROJ. NO. 3123
SHEET: C3.2
DSA Backcheck

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Exp. 6/30/26
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STATE OF CALIFORNIA
10/24/25

GRADING, DRAINAGE, & UTILITY PLAN

SOCCER FIELD + TRACK REPLACEMENT AND NEW RESTROOM BUILDING FOR:

CHUALAR UNION E.S.

24285 LINCOLN ST, CHUALAR, CA 93925
CHUALAR UNION SCHOOL DISTRICT

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CEI PROJ NO. 3123
SHEET:

C4.1

DSA Backcheck

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CHUALAR RD.
(A COUNTY RD. - 45' WIDE)

LINCOLN ST.
(A COUNTY RD. – 100' WIDE)

PAYSON ST.
(A COUNTY RD. – 100' WIDE)

SCOTT ST.
(A COUNTY RD. – 100' WIDE)

BK. 160 O.R. PG. 246

SEE LANDSCAPE DRAWINGS FOR ADDITIONAL DETAILS AND DIMENSIONS

RUBBER TRACK

GRASS AREA

(E) FLAT DRAIN

WOOD RET. WALL

DIRT DITCH

LT ELEC PANEL ON LT POLE

CONCRETE STRIP

GATE

SIDEWALK

ASPHALT GUTTER

CONC GUTTER

CONC CURB

18" CMP INV ELEV: 496.40'

18" CMP INV ELEV: 496.25'

(E)8" WATER

UNKN PVC STUB

125.06 | 125.67 | 124.99 | 124.90 | 124.83 | 122.74 | 122.81 | 122.72 | 122.65 | 123.94 | 123.91

0.5% | 0.87%

123.54 ASPHALT OVERLAY
123.45±(ME)
123.38±(ME)
123.47
7.8% | 0.8%(E) | 1.4%

CONNECT TO (E)4" WATER

REMOVE & REPLACE CONCRETE WALK IN KIND AS NEEDED SAWCUT & CONFORM AT NEAREST SCORE JOINT

REMOVE & REPLACE ASPHALT CONCRETE IN KIND AS NEEDED SAWCUT CONCRETE WALK TO REMAIN. SAWCUT AC MIN 1.5 FEET WIDE FROM CONCRETE WALK ASSUME 2"AC OVER 8" CLASS 2 AB

225 LF-2" DOMESTIC WATER

0.7%(E)

CONC GUTTER

CONC RAMP

ASHALT

CONC

CMU WALL

SHED

STEPS

BUILDING

CONC BENCH

(E)SS

BLDG E
LIBRARY, (E) CLASSROOMS AND RESTROOMS
DSA NO. 33037

BLDG F
(E) MULTI-PURPOSE AUDITORIUM AND RESTROOMS
DSA NO. 33037

2" WATER

SSCO INV 121.85

(N)SS

(N) BLDG Q (REST ROOMS)

SEE ENLARGED VIEW THIS SHEET

SEE ELECTRICAL PLANS

55 LF-4"SS @ S=1%MIN

REMOVE & REPLACE CONCRETE WALK IN KIND SAWCUT & CONFORM AT NEAREST SCORE JOINT

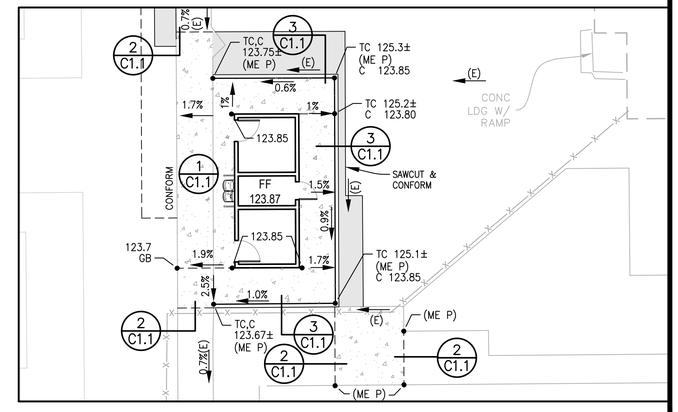
CONNECT TO (E)6"SS INV<121.3
VERIFY EXISTING INVERT AS FIRST ORDER OF WORK

(E) SOLAR CANOPY
DSA NO. 01-119512

(E)6" SS

MATCHLINE

SEE SHEET C4.2 FOR CONTINUATION



ENLARGED VIEW
SCALE: 1" = 10'

20 0 20 40
(IN FEET)
1 inch = 20 ft.
GRAPHIC SCALE

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O:\3123 – Chualar ES Field_DWG\3123-C4 Grading.dwg 10-23-25

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MATCHLINE

SEE SHEET C4.1 FOR CONTINUATION

BLDG A
(E) CLASSROOMS
DSA NO. 42415

HEAD START
(E) RELOCATABLE
CLASSROOMS
DSA NOS. 69197, 6919

(E) GYMNASIUM
AND FOOD SERVICE
DSA NO. 01-105262

(E)3" WATER
(E)2" GAS
(E)6"SS
(E)8" WATER

SAWCUT & CONFORM AT NEAREST SCORE JOINT

FLAT

FLAG POLE TO REMAIN

(IN FEET)
1 INCH = 10 FEET
GRAPHIC SCALE

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CIVIL
STATE OF CALIFORNIA
10/24/25

GRADING, DRAINAGE, & UTILITY PLAN

SOCCER FIELD + TRACK REPLACEMENT AND NEW RESTROOM BUILDING FOR:

CHUALAR UNION E.S.

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CHUALAR UNION SCHOOL DISTRICT

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DRAWN: STAFF
JOB: 24033
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SHEET: C4.2
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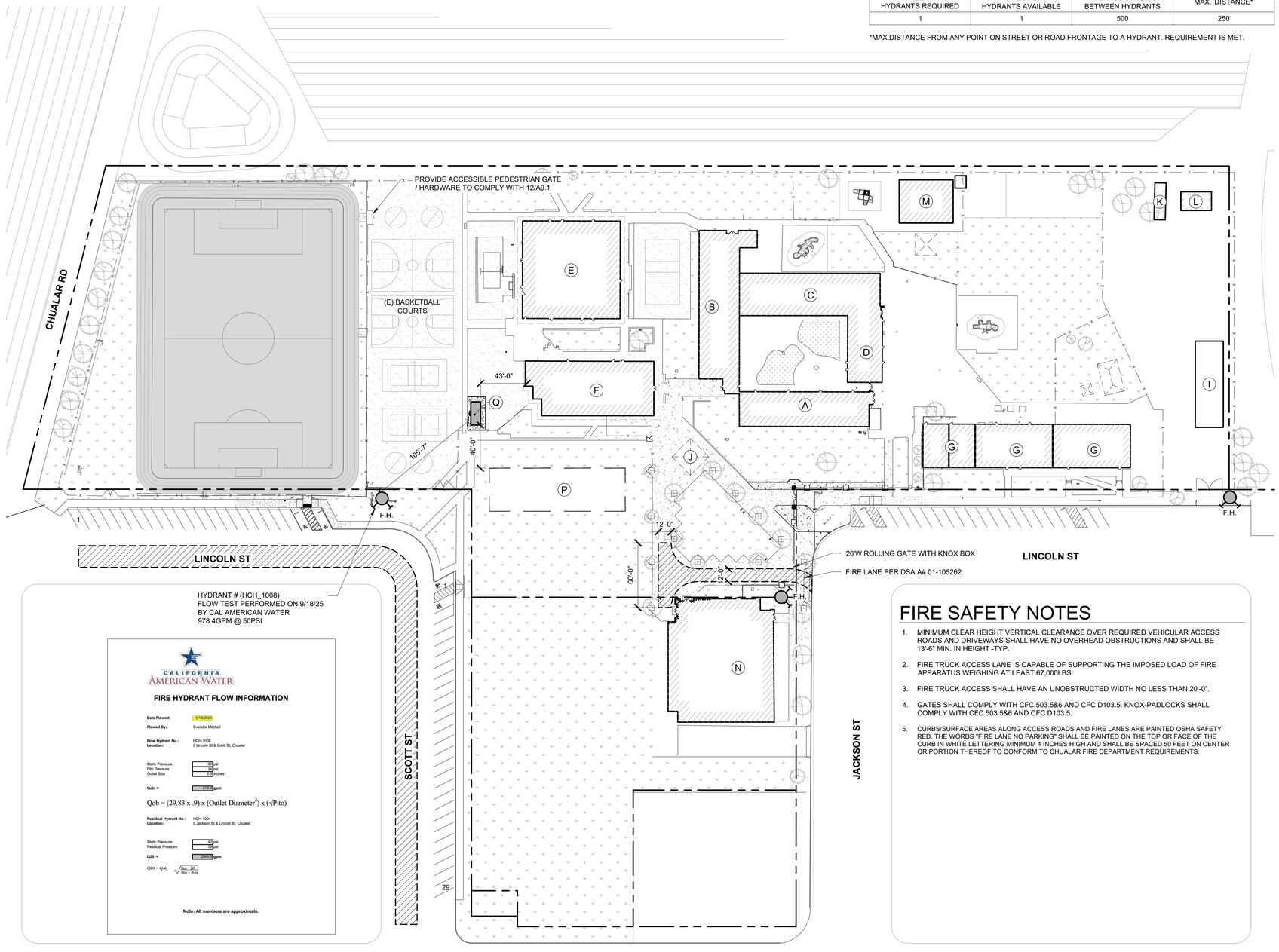
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FIRE HYDRANT CODE CALCULATION

FIRE AREA (INCLUDING OVERHANGS) PER (CFC BB104.1)	FIRE-FLOW (GPM) PER TABLE BB105.1	FLOW DURATION (HRS)
RESTROOM BUILDING: 304 SF	1,500	2

NUMBER AND DISTRIBUTION OF FIRE HYDRANTS PER TABLE CC105.1			
NUMBER OF HYDRANTS REQUIRED	NUMBER OF HYDRANTS AVAILABLE	AVERAGE SPACING BETWEEN HYDRANTS	MAX. DISTANCE*
1	1	500	250

*MAX.DISTANCE FROM ANY POINT ON STREET OR ROAD FRONTAGE TO A HYDRANT. REQUIREMENT IS MET.



FIRE SAFETY NOTES

1. MINIMUM CLEAR HEIGHT VERTICAL CLEARANCE OVER REQUIRED VEHICULAR ACCESS ROADS AND DRIVEWAYS SHALL HAVE NO OVERHEAD OBSTRUCTIONS AND SHALL BE 13'-6" MIN. IN HEIGHT -TYP.
2. FIRE TRUCK ACCESS LANE IS CAPABLE OF SUPPORTING THE IMPOSED LOAD OF FIRE APPARATUS WEIGHING AT LEAST 67,000LBS.
3. FIRE TRUCK ACCESS SHALL HAVE AN UNOBSTRUCTED WIDTH NO LESS THAN 20'-0".
4. GATES SHALL COMPLY WITH CFC 503.5&6 AND CFC D103.5. KNOX-PADLOCKS SHALL COMPLY WITH CFC 503.5&6 AND CFC D103.5.
5. CURBS/SURFACE AREAS ALONG ACCESS ROADS AND FIRE LANES ARE PAINTED OSHA SAFETY RED. THE WORDS "FIRE LANE NO PARKING" SHALL BE PAINTED ON THE TOP OR FACE OF THE CURB IN WHITE LETTERING MINIMUM 4 INCHES HIGH AND SHALL BE SPACED 50 FEET ON CENTER OR PORTION THEREOF TO CONFORM TO CHUALAR FIRE DEPARTMENT REQUIREMENTS.

PROJECT NORTH

1 OVERALL FIRE ACCESS SITE PLAN
SCALE: 1" = 50'-0"

LEGEND

- PROPERTY LINE
- AREA OF WORK
- BUILDING TO REMAIN
- CONCRETE
- SOLAR ARRAY TO REMAIN
- FENCE TO REMAIN
- 7'H DECORATIVE IRON FENCE
- LANDSCAPE TO REMAIN
- ASPHALT TO REMAIN
- FIRE ACCESS LANE PER DSA #01-119512
- FIRE HYDRANT TO REMAIN
- (A) BUILDING LEGEND DESIGNATION

EXISTING BUILDING LEGEND

BLDG	DESCRIPTION	OCC.	CONST. TYPE	AREA (SF)	DSA #
A	CLASSROOMS	E	V-B	3,725	42415
B	CLASSROOMS AND RESTROOMS	E	V-B	5,220	5301
C	CLASSROOMS	E	V-B	4,014	42415
D	CLASSROOMS AND RESTROOMS	E	V-B	1,828	42415
E	CLASSROOMS AND RESTROOMS	E	V-B	8,100	33037
F	ADMINISTRATION BUILDING	B	V-B	5,400	33037
G	CLASSROOMS	E	V-B	7,760	69197, 69198, 60615
I	STORAGE	S-1	V-B	1,440	FIELD ACT EXEMPT
J	ENTRY SHELTER	E	V-B	400	01-101518
K	PUMP HOUSE	S-1	V-B	300	FIELD ACT EXEMPT
L	STORAGE	S-1	V-B	600	FIELD ACT EXEMPT
M	CLASSROOMS	E	V-B	1,600	01-104586
N	GYMNASIUM AND FOOD SERVICE	A-2	V-B	10,515	01-105262
P	SOLAR ARRAY	S-2	II-B	5,166	01-119512

NEW BUILDING LEGEND

BLDG	DESCRIPTION	OCC.	CONST. TYPE	AREA (SF)	NO. OF STORIES	BLDG. HEIGHT
Q	(N) RESTROOM BUILDING	E	V-B	194	1	11'-4"

DSA 810

FIRE & LIFE SAFETY SITE CONDITIONS SUBMITTAL

Division of the State Architect (DSA) documents referenced within this publication are available on the DSA Forms or DSA Publications webpages.

To facilitate the Division of the State Architect's (DSA) fire and life safety plan review of project site conditions, DSA requires the design professional to provide the following information at time of project submittal for projects consisting of construction of a new campus, construction of new building(s), additions to existing buildings, and for site alternate design means for fire department emergency vehicle access, and fire suppression water supply.

Information associated with compliance items 1 through 3 below is to be provided for all project types indicated above. Information associated with items 4 through 7 is to be completed when an alternate means is utilized. Acknowledgement by the school district and signature from the Local Fire Authority (LFA) is only required when an alternate design means is being requested.

The Project Information and Fire & Life Safety Information sections are to be completed for all projects and imaged onto the fire access site plan. When an alternate design/means is proposed, all sections on pages 1 and 2 are to be completed and imaged on the fire access site plan.

For additional information refer to the instructions at the end of this form and DSA Policy *PL 09-01: Fire Flow for Buildings*.

PROJECT INFORMATION	
School District/Owner:	Chualar Union School District
Project Name/School:	Track + Field Replacement & New Restroom Building for: Chualar Union E.S.
Project Address:	24285 Lincoln Street, Chualar, CA 93925

FIRE & LIFE SAFETY INFORMATION				
1.	Has a fire hydrant flow test been performed within the past 12 months? *(If yes, provide a copy of the test data.)*	Yes ☑		No ☐
2.	Was the fire hydrant water flow test performed as part of this LFA review?	Yes ☑		No ☐
3.	Is the project located within a designated fire hazard severity zone (FHSZ) as established by Cal-Fire? *(If yes, indicate FHSZ classification below.)*	Yes ☐		No ☑
	Refer to the following website for FHSZ locations: Fire Hazard Severity Zones in State Responsibility Area	Moderate ☐	High ☐	Very High ☐
	Wildland Interface Area (WIFA) *(If any designations are checked, project design must meet the requirements of CBC Chapter 7A.)*			WIFA ☐

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DATE: 02/11/2026

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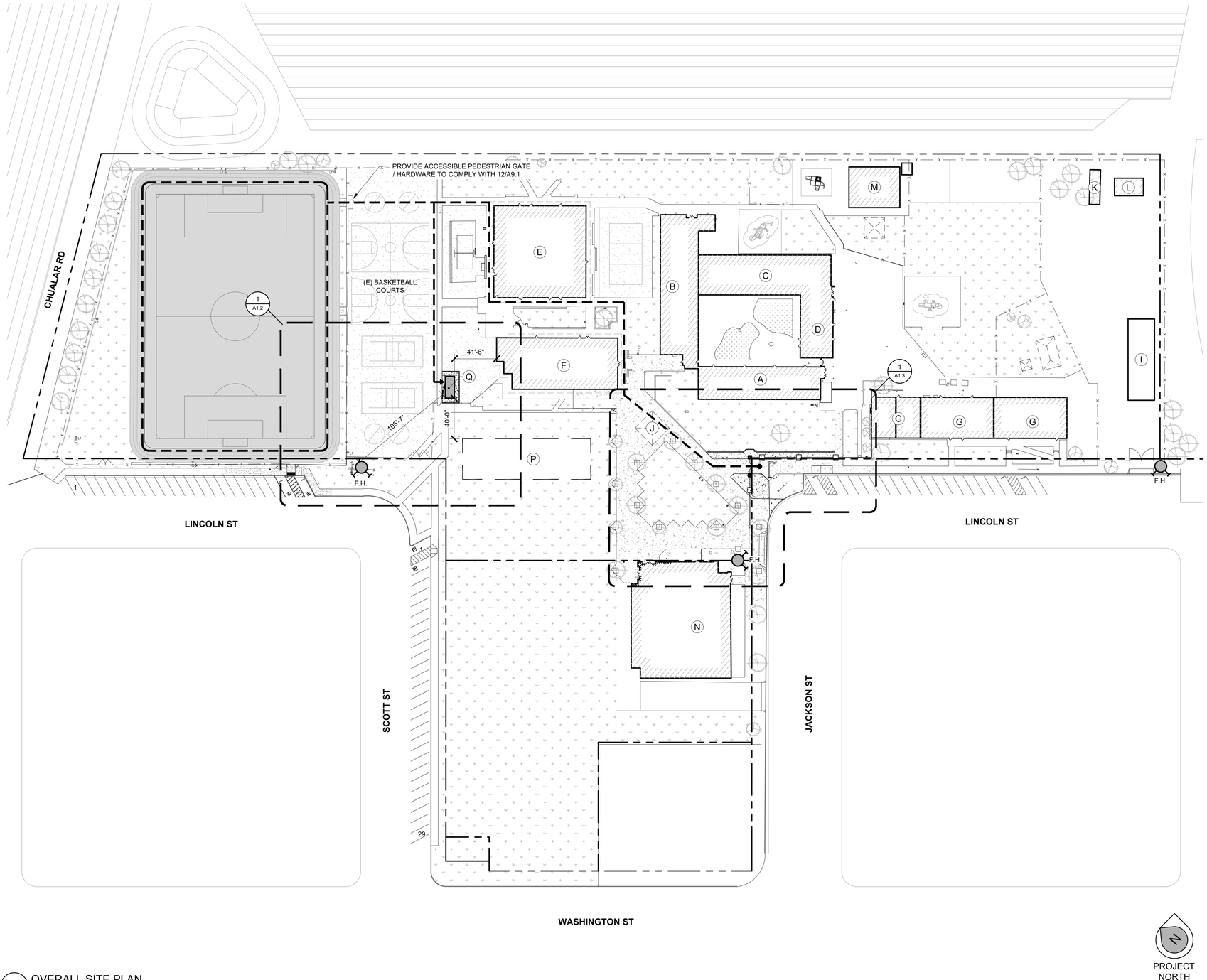
LICENSED ARCHITECT
DAVID PEARTREE
C-30852
Exp. 12/31/27
STATE OF CALIFORNIA

OVERALL FIRE ACCESS SITE PLAN
TRACK + FIELD REPLACEMENT AND NEW RESTROOM BUILDING FOR:
CHUALAR UNION E.S.
24285 LINCOLN ST, CHUALAR, CA 93925
CHUALAR UNION SCHOOL DISTRICT

REV.	DATE	DESCRIPTION
	06/23/25	1ST PLAN CHECK SUBMITTAL
	10/24/25	1ST PLAN CHECK RE-SUBMITTAL
	01/28/26	2ND BACK CHECK RE-SUBMITTAL

DATE: 05/15/2025
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JOB: 24033
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1 OVERALL SITE PLAN
SCALE: 1" = 50'-0"

LEGEND

- PROPERTY LINE
- ACCESSIBLE PATH OF TRAVEL
- AREA OF WORK
- BUILDING TO REMAIN
- CONCRETE
- SOLAR ARRAY TO REMAIN
- FENCE TO REMAIN
- 7'H DECORATIVE IRON FENCE
- LANDSCAPE TO REMAIN
- ASPHALT TO REMAIN
- (A) ROOM LEGEND DESIGNATION

PATH OF TRAVEL, TECHNICAL REQUIREMENTS FOR ACCESSIBLE ROUTE

ACCESSIBLE PATH OF TRAVEL AS INDICATED ON PLAN IS A BARRIER-FREE ACCESS ROUTE WITHOUT ABRUPT LEVEL CHANGES EXCEEDING ½" IF BEVELED AT 1:2 MAXIMUM SLOPE OR VERTICAL LEVEL CHANGES NOT EXCEEDING ¼" MAXIMUM AND AT LEAST 48" IN WIDTH. SURFACE IS STABLE, FIRM, AND SLIP-RESISTANT. CROSS-SLOPE SHALL NOT BE STEEPER THAN 1:48 AND SLOPE IN THE DIRECTION OF TRAVEL SHALL NOT BE STEEPER THAN 1:20. ACCESSIBLE PATH OF TRAVEL SHALL BE MAINTAINED FREE OF OVERHANGING OBSTRUCTIONS TO 80" MINIMUM AND FREE OF OBJECTS PROTRUDING MORE THAN 4" FROM THE WALL, ABOVE 27" AND LESS THAN 80" ABOVE THE FLOOR. ARCHITECT SHALL VERIFY THAT THERE ARE NO BARRIERS IN THE PATH OF TRAVEL.

ACCESSIBILITY BY DESIGN PROFESSIONAL IN GENERAL RESPONSIBLE CHARGE

DESIGN PROFESSIONAL IN GENERAL RESPONSIBLE CHARGE STATEMENT: THE POT IDENTIFIED IN THESE CONSTRUCTION DOCUMENTS MEETS THE REQUIREMENTS OF THE CURRENT APPLICABLE CALIFORNIA BUILDING CODE (CBC) ACCESSIBILITY PROVISIONS FOR PATH OF TRAVEL REQUIREMENTS FOR ALTERATIONS, ADDITIONS AND STRUCTURAL REPAIRS. AS PART OF THE DESIGN OF THIS PROJECT, THE POT WAS EXAMINED AND ANY ELEMENTS, COMPONENTS OR PORTIONS OF THE POT THAT WERE DETERMINED TO BE NON-COMPLIANT WITH THE CBC HAVE BEEN IDENTIFIED AND THE CORRECTIVE WORK NECESSARY TO BRING THEM INTO COMPLIANCE HAS BEEN INCLUDED WITHIN THE SCOPE OF THIS PROJECT'S WORK THROUGH DETAILS, DRAWINGS AND SPECIFICATIONS INCORPORATED INTO THESE CONSTRUCTION DOCUMENTS. ANY NONCOMPLIANT ELEMENTS, COMPONENTS OR PORTIONS OF THE POT THAT WILL NOT BE CORRECTED BY THIS PROJECT BASED ON VALUATION THRESHOLD LIMITATIONS OR A FINDING OF UNREASONABLE HARDSHIP ARE INDICATED IN THESE CONSTRUCTION DOCUMENTS.

DURING CONSTRUCTION, IF POT ITEMS WITHIN THE SCOPE OF THE PROJECT REPRESENTED AS CBC COMPLIANT ARE FOUND TO BE NONCONFORMING BEYOND REASONABLE CONSTRUCTION TOLERANCES, THE ITEMS SHALL BE BROUGHT INTO COMPLIANCE WITH THE CBC AS A PART OF THIS PROJECT BY MEANS OF A CONSTRUCTION CHANGE DOCUMENT.

EXISTING BUILDING LEGEND

BLDG	DESCRIPTION	OCC.	CONST. TYPE	AREA (SF)	DSA #
A	CLASSROOMS	E	V-B	3,725	42415
B	CLASSROOMS AND RESTROOMS	E	V-B	5,220	5301
C	CLASSROOMS	E	V-B	4,014	42415
D	CLASSROOMS AND RESTROOMS	E	V-B	1,828	42415
E	CLASSROOMS AND RESTROOMS	E	V-B	8,100	33037
F	ADMINISTRATION BUILDING	B	V-B	5,400	33037
G	CLASSROOMS	E	V-B	7,760	69197, 69198, 60615
I	STORAGE	S-1	V-B	1,440	FIELD ACT EXEMPT
J	ENTRY SHELTER	E	V-B	400	01-101518
K	PUMP HOUSE	S-1	V-B	300	FIELD ACT EXEMPT
L	STORAGE	S-1	V-B	600	FIELD ACT EXEMPT
M	CLASSROOMS	E	V-B	1,600	01-104586
N	GYMNASIUM AND FOOD SERVICE	A-2	V-B	10,515	01-105262
P	SOLAR ARRAY	S-2	II-B	5,166	01-119512

NEW BUILDING LEGEND

BLDG	DESCRIPTION	OCC.	CONST. TYPE	AREA (SF)	NO. OF STORIES	BLDG. HEIGHT
Q	(N) RESTROOM BUILDING	E	V-B	194	1	11'-4"

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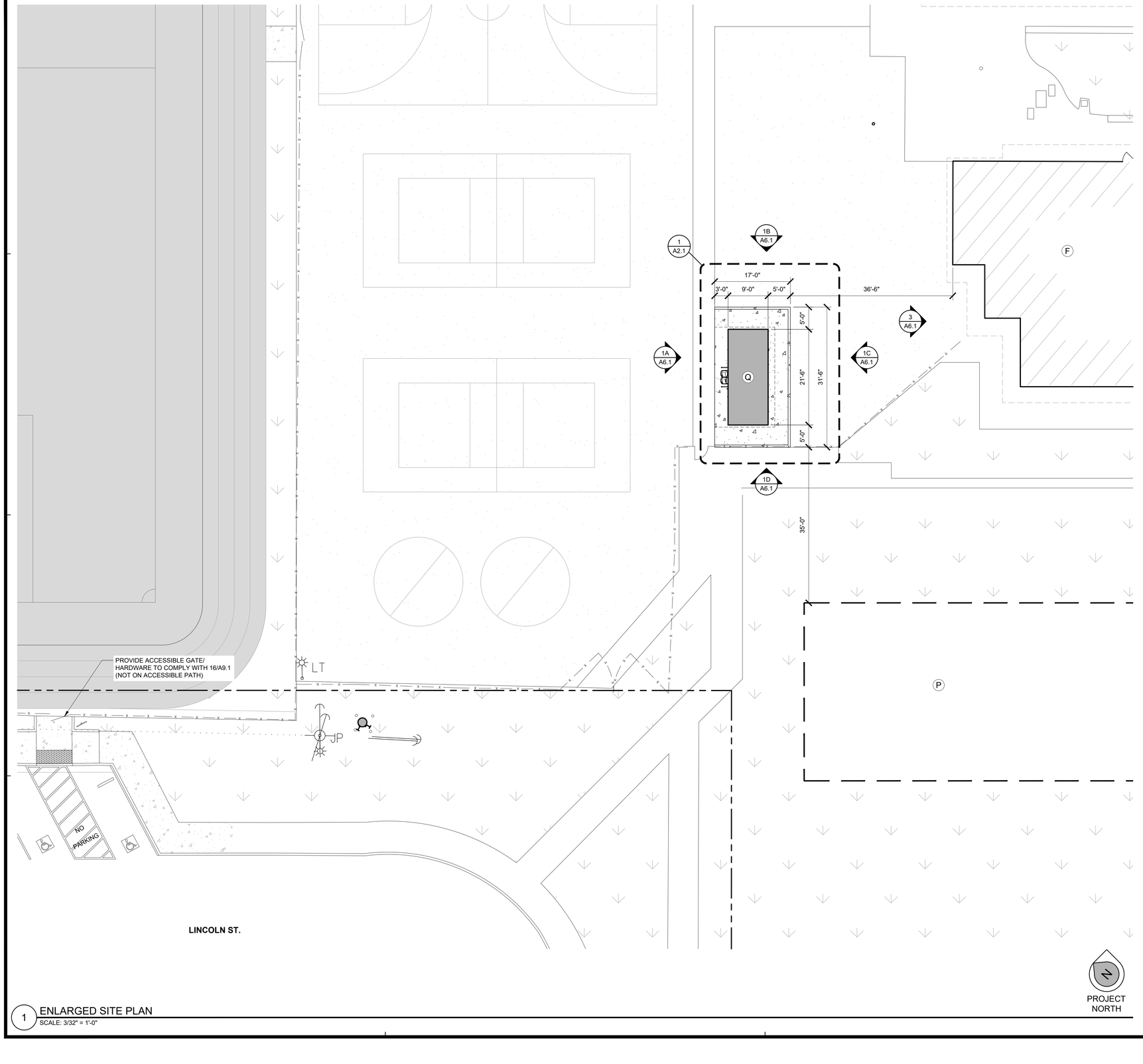
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ANTHONY TRAVIS BELLI
C-30852
Exp. 12/31/27
STATE OF CALIFORNIA

OVERALL SITE PLAN
TRACK + FIELD REPLACEMENT AND NEW RESTROOM BUILDING FOR:
CHUALAR UNION E.S.
24285 LINCOLN ST. CHUALAR, CA 93925
CHUALAR UNION SCHOOL DISTRICT

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1 ENLARGED SITE PLAN
SCALE: 3/32" = 1'-0"

LEGEND

- PROPERTY LINE
- AREA OF WORK
- BUILDING TO REMAIN
- CONCRETE
- BUILDING LEGEND DESIGNATION
- FENCE TO REMAIN
- LANDSCAPE TO REMAIN
- ASPHALT TO REMAIN
- SOLAR ARRAY TO REMAIN
- FIRE HYDRANT TO REMAIN

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ENLARGED SITE PLAN

TRACK + FIELD REPLACEMENT AND NEW RESTROOM BUILDING FOR:

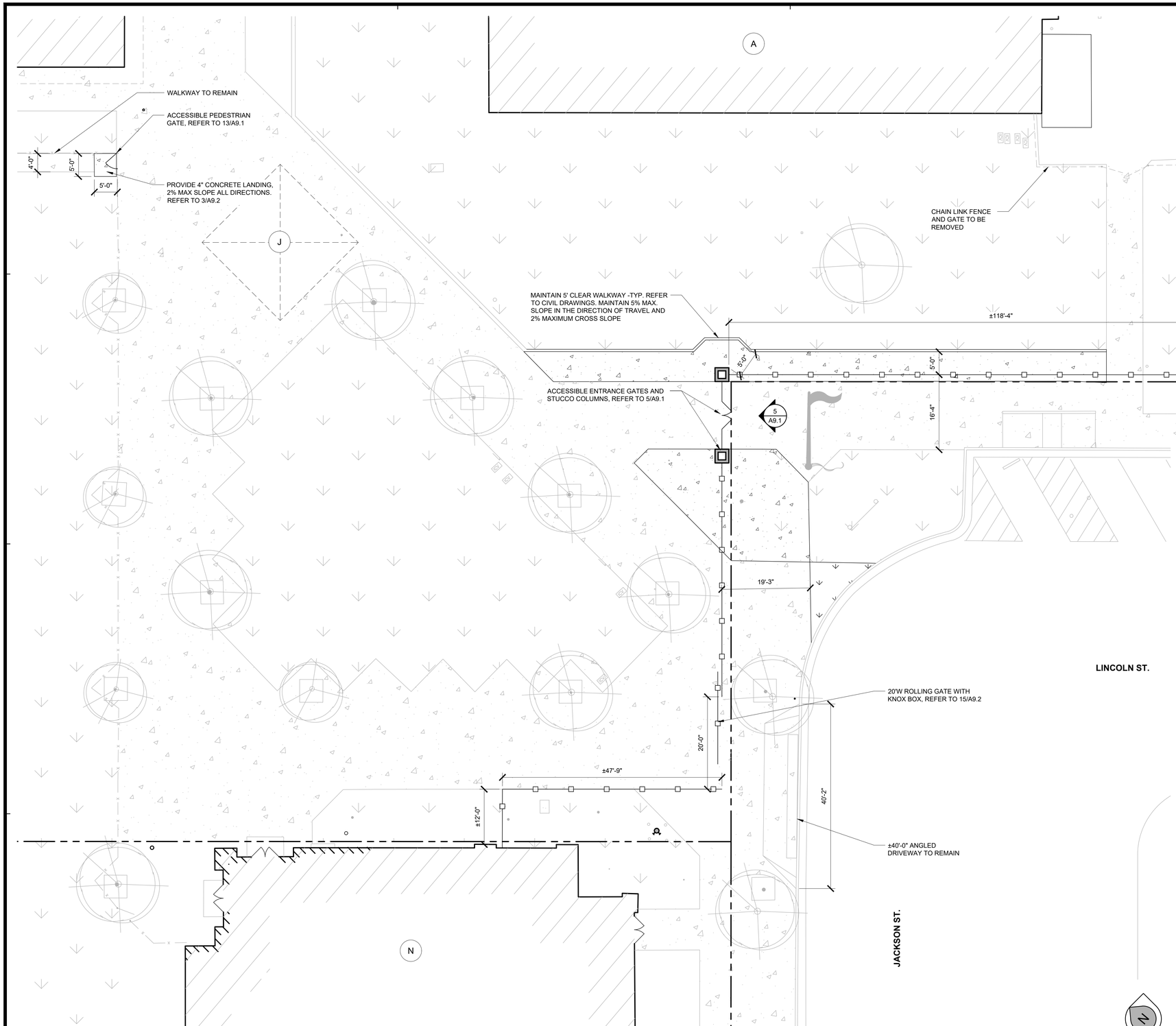
CHUALAR UNION E.S.

24285 LINCOLN ST. CHUALAR, CA 93925
CHUALAR UNION SCHOOL DISTRICT

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1 ENLARGED SITE PLAN
SCALE: 3/32" = 1'-0"

LEGEND

- PROPERTY LINE
- FENCE TO REMAIN
- BUILDING TO REMAIN
- 7'H DECORATIVE IRON FENCE
- CONCRETE, SEE NOTE #5
- LANDSCAPE TO REMAIN
- LANDSCAPING
- CONCRETE TO REMAIN
- (A) BUILDING LEGEND DESIGNATION

GENERAL NOTES

1. CONTRACTOR TO DEMOLISH EXISTING FENCE, LANDSCAPING, CONCRETE AND ANY OTHER ITEMS IN WAY OF NEW WORK.
2. CONTRACTOR TO VERIFY ALL (E) CONDITIONS IN THE FIELD AND SHOULD REPORT IN WRITING TO ARCHITECT ANY AND ALL ITEMS THAT DEVIATE FROM THE DRAWING.
3. ON-SITE UTILITY WORK SHOWN IN ELECTRICAL DRAWINGS. VERIFY ALL (E) CONDITIONS IN FIELD. SAWCUT ALL HARD SURFACES PRIOR TO REMOVAL. PATCH AND REPAIR ALL SURFACES TO MATCH (E).
4. (E) IRRIGATION AND UNDERGROUND UTILITIES:
   A. LOCATIONS OF IRRIGATION LINES, VALVES, HEADS, AND ALL OTHER RELATED IRRIGATION APPURTENANCES ARE NOT SHOWN ON THESE DRAWINGS. CONTRACTOR TO FIELD VERIFY (E) IRRIGATION LINES IN THE AREA OF WORK. CONTRACTOR IS TO SHUT-OFF THE IRRIGATION LINES/IRRIGATION ZONES IN THE AREA OF WORK PRIOR TO CONSTRUCTION AND LOCATE ALL IRRIGATION LINES/HEADS THAT NEED TO BE REMOVED AND OR CAPPED AS REQUIRED IN WAY OF (N) WORK. CONTRACTOR SHALL RETURN IRRIGATION SYSTEM TO OPERATIONAL CONDITION PRIOR TO COMPLETION OF PROJECT.
   B. UTILITIES: CONTRACTOR SHALL VERIFY LOCATION OF ALL ON-SITE UTILITIES. RESTORATION OF DAMAGED UTILITIES SHALL BE MADE AT THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
   C. SCHEMATIC: SYSTEM FEATURES ARE SHOWN SCHEMATICALLY FOR GRAPHIC CLARITY. CONTRACTOR SHALL COORDINATE WITH THE DISTRICT AND ARCHITECT THE EXACT TRENCH UTILITY ROUTE PRIOR TO START OF CONSTRUCTION.
   D. CONTRACTOR SHALL CONTACT THE LOCAL UNDERGROUND UTILITY LOCATOR FOR UTILITY LOCATION AND IDENTIFICATION PRIOR TO START OF DEMOLITION.
5. SITE CONCRETE SHALL BE 4" THICK MINIMUM. REFER TO SPECIFICATIONS. CONTRACTOR TO EPOXY DOWEL CONCRETE TO EXISTING CONCRETE WALKWAYS PER DETAIL 2/C1.1. ALL TRANSITIONS TO BE FLUSH.

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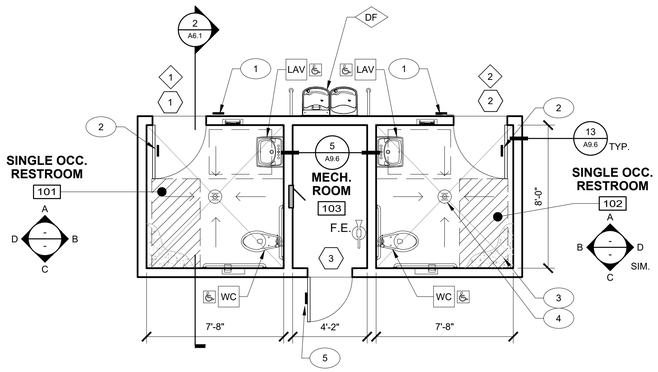
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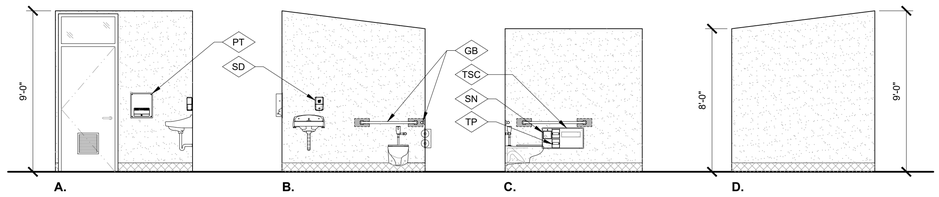
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ENLARGED SITE PLAN
TRACK + FIELD REPLACEMENT AND NEW RESTROOM BUILDING FOR:
CHUALAR UNION E.S.
24285 LINCOLN ST. CHUALAR, CA 93925
CHUALAR UNION SCHOOL DISTRICT

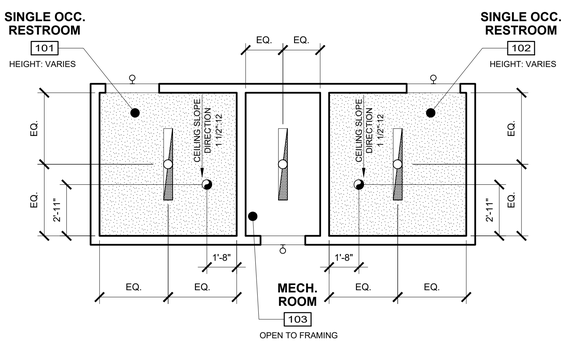
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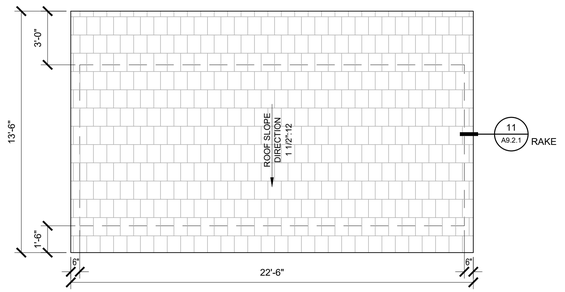




1 ENLARGED SINGLE OCC. RESTROOM (R.R. #102 IS A MIRRORED LAYOUT OF R.R. #101)
SCALE: 1/4" = 1'-0"



2 RCP
SCALE: 1/4" = 1'-0"



3 ROOF PLAN
SCALE: 1/4" = 1'-0"

PROJECT NORTH

LEGEND

WALLS

- WOOD STUD WALL
- FRP, WALL PROTECTION PANELS
- 6" INTEGRAL COVE BASE
- GYP BOARD CEILING
- ASPHALT SHINGLES
- LIGHT FIXTURE, SEE ELECTRICAL SHEETS
- LIGHT FIXTURE, SEE ELECTRICAL SHEETS
- F.E. FIRE EXTINGUISHER, REFER TO 4/A9.2

NOTE:
FOR TYPICAL ACCESSIBLE CLEAR FLOOR AND TURNING SPACES, SEE DETAIL 9/A9.0

FIXTURE LEGEND

- INDICATES ACCESSIBLE FIXTURE
- LAV LAVATORY, SEE DETAIL 10/A9.0
- WC WATER CLOSET

NOTE:
FOR TYPICAL ACCESSIBLE REQUIREMENTS, HEIGHTS AND CLEARANCES AT FIXTURES, SEE DETAIL 5/A9.0

ACCESSORY LEGEND

- TP TOILET PAPER DISPENSER
- PT PAPER TOWEL DISPENSER
- DF DRINKING FOUNTAIN, SEE DETAIL 14/A9.0
- SD SOAP DISPENSER
- GB GRAB BAR, SEE DETAIL 4/A9.0
- TSC TOILET SEAT COVER DISPENSER
- SN SANITARY NAPKIN DISPENSER

NOTE:
FOR MAXIMUM RESTROOM ACCESSORY HEIGHTS, PROJECTIONS AND CLEARANCES, SEE DETAIL 5/A9.0

GENERAL NOTES (#)

1. TACTILE RESTROOM SIGNAGE, PER DETAIL 16A/A9.0
2. RESTROOM DOOR IDENTIFICATION SYMBOL, PER DETAIL 16B/A9.0
3. RESINOUS FLOORING W/ 6" INTEGRAL COVE BASE
4. FLOOR DRAIN, REFER TO STRUCTURAL AND PLUMBING DRAWINGS
5. MECHANICAL ROOM SIGNAGE, PER DETAIL 4/A9.1

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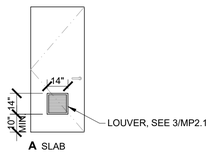
FLOOR PLAN
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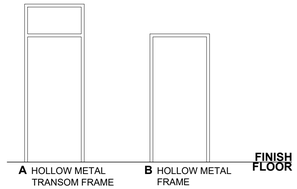
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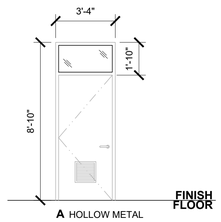
DOOR TYPES



FRAME TYPES



WINDOW TYPES



DOOR SCHEDULE

DOOR								FRAME			DETAILS			
NUMBER	SIZE (W x H)	TYPE	RATING	HW #	THICKNESS	MATERIAL	FINISH	MATERIAL	FINISH	TYPE	HEAD DETAIL	JAMB DETAIL	THRESHOLD/ TRANSITION DETAIL	REMARKS
1	3'-0" x 7'-0"	A	-	01	1 3/4"	HM	PSG	HM/ TRANSOM	PSG	A	14/A9.6	14/A9.6	13/A9.0	-
2	3'-0" x 7'-0"	A	-	01	1 3/4"	HM	PSG	HM/ TRANSOM	PSG	A	14/A9.6	14/A9.6	13/A9.0	-
3	2'-6" x 7'-0"	A	-	02	1 3/4"	HM	PSG	HM	PSG	B	14/A9.6	14/A9.6	13/A9.0	-

WINDOW SCHEDULE

WINDOW				GLAZING			FRAME		DETAILS			
NUMBER	SIZE (W x H)	TYPE	RATING	GLASS TYPE	GLASS SURFACE	SAFETY GLASS	MATERIAL	FINISH	HEAD DETAIL	JAMB DETAIL	SILL DETAIL	REMARKS
1	3'-4" x 1'-10"	A	-	DG/T	LOW-E	-	HM	PSG	14/A9.6	14/A9.6	-	PROVIDE OBSCURE GLASS
2	3'-4" x 1'-10"	A	-	DG/T	LOW-E	-	HM	PSG	14/A9.6	14/A9.6	-	PROVIDE OBSCURE GLASS

INTERIOR FINISH SCHEDULE

ROOM #	ROOM NAME	FLOOR		BASE			WAINSCOT		WALLS													CEILING	REMARKS
									A - NORTH			B - EAST			C - SOUTH			D - WEST				
		MATERIAL	FINISH	MATERIAL	FINISH	HEIGHT	MATERIAL	FINISH	MATERIAL	FINISH	COLOR	MATERIAL	FINISH	COLOR	MATERIAL	FINISH	COLOR	MATERIAL	FINISH	COLOR	MATERIAL	
BUILDING A - MULTI-PURPOSE																							
101	SINGLE OCC. RESTROOM	EP	FF	EP	FF	6"	-	-	FRP	FF	PER SCHED.	FRP	FF	PER SCHED.	FRP	FF	PER SCHED.	FRP	FF	PER SCHED.	PSG	FRP TO BE FULL HEIGHT
102	SINGLE OCC. RESTROOM	EP	FF	EP	FF	6"	-	-	FRP	FF	PER SCHED.	FRP	FF	PER SCHED.	FRP	FF	PER SCHED.	FRP	FF	PER SCHED.	PSG	FRP TO BE FULL HEIGHT
103	MECHANICAL ROOM	EXP. CONC.	BF	EXP. CONC.	-	-	-	-	FRP	FF	PER SCHED.	FRP	FF	PER SCHED.	FRP	FF	PER SCHED.	FRP	FF	PER SCHED.	OPEN	FRP TO BE FULL HEIGHT

COLOR AND MATERIAL SCHEDULE

Symbol	Material	Manufacturer	Style	Color
EP-1	EPOXY	DUR-A-FLEX	-	OCEAN
FRP-1	FIBER REINFORCED PANEL	MARLITE	SMOOTH	P 151 LIGHT GREY
P-1	PAINT	DUNN-EDWARDS	INTERIOR CEILING	TBD
P-2	PAINT	DUNN-EDWARDS	EXTERIOR WALL	TBD - PAINT MATCH (E) CAMPUS
P-3	PAINT	DUNN-EDWARDS	(EXTERIOR ACCENT / TRIM / DOORS)	TBD - PAINT MATCH (E) CAMPUS

GENERAL NOTES

1. DOOR HARDWARE MOUNTING HEIGHTS, REFER TO 8/A9.0

ABBREVIATIONS

HM	HOLLOW METAL
PSG	SEMI-GLOSS PAINT
T	TEMPERED
DG	DUAL GLAZED
FF	FACTORY FINISH
BF	BROOM FINISH
LAM	LAMINATED
T	TEMPERED
EP	EPOXY
FRP	FIBERGLASS REINFORCED PLASTIC

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 01-122444 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 02/11/2026

Peartree+Belli
ARCHITECTS
235 MONTEREY ST., SUITE B
SALINAS, CA 93901
(831) 424-4620
PEARTREEBELLI.COM

LICENSED ARCHITECT
DAVID PEARTREE
C- 30852
Exp. 12/31/27
STATE OF CALIFORNIA

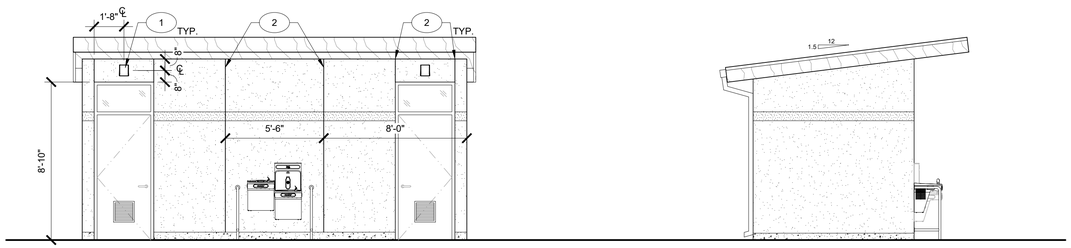
DOOR AND WINDOW SCHEDULE

TRACK + FIELD REPLACEMENT AND NEW RESTROOM BUILDING FOR:
CHUALAR UNION E.S.
24285 LINCOLN ST. CHUALAR, CA 93925
CHUALAR UNION SCHOOL DISTRICT

REV.	DATE	DESCRIPTION
	06/23/25	1ST PLAN CHECK SUBMITTAL
	10/24/25	1ST PLAN CHECK RE-SUBMITTAL
	01/28/26	2ND BACK CHECK RE-SUBMITTAL

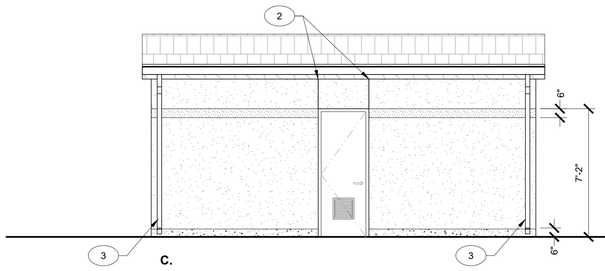
DATE: 05/15/2025
SCALE: AS NOTED
DRAWN:
JOB: 24033
SHEET: A5.1

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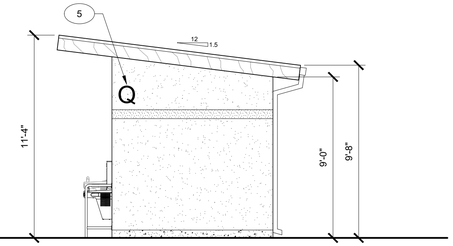


A.

B.

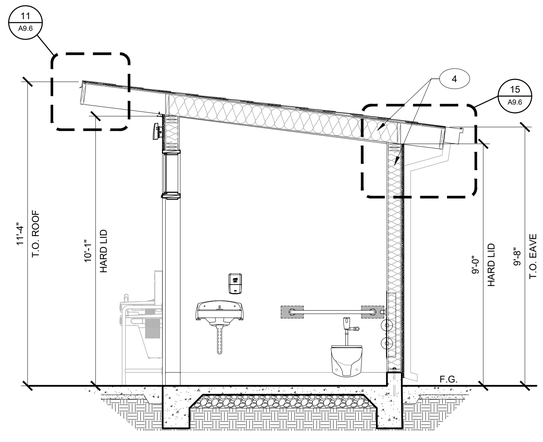


C.

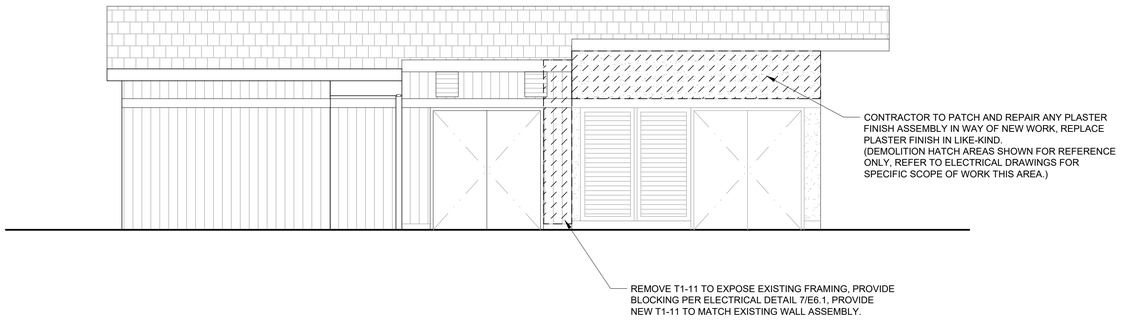


D.

1 EXTERIOR ELEVATIONS
SCALE: 1/4" = 1'-0"



2 SECTION
SCALE: 3/8" = 1'-0"



3 EXTERIOR ELEVATION - BUILDING F
SCALE: 1/4" = 1'-0"

LEGEND

- PT-1: EXTERIOR PLASTER -COLOR TBD
- PT-2: 6" ACCENT BAND EXTERIOR PLASTER - COLOR TBD
- PT-3: EXPOSED WOOD FRAMING - COLOR TBD
- EXTERIOR WALL-MOUNTED LIGHT FIXTURE (SEE ELECTRICAL)

GENERAL NOTES (#)

1. SURFACE MOUNTED LIGHT FIXTURE, SEE ELECTRICAL DRAWINGS
2. PLASTER CONTROL JOINTS, SEE 8, 12, 16/A9.6
3. DOWNSPOUTS, SEE 15/A9.6 FOR ADDITIONAL INFORMATION
4. BATT INSULATION, PROVIDE R-30 MIN. AT CEILINGS AND R-19MIN. AT ALL WALLS.
5. BUILDING IDENTIFICATION, SEE 8/A9.1

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 01-122444 INC:
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SS ☑ FLS ☑ ACS ☑
DATE: 02/11/2026

Peartree+Belli
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SALINAS, CA 93901
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PEARTREEBELLI.COM

DAVID PAUL BELLI
LICENSED ARCHITECT
C- 30852
Exp. 12/31/27
STATE OF CALIFORNIA

EXTERIOR ELEVATIONS & SECTION

TRACK + FIELD REPLACEMENT AND NEW RESTROOM BUILDING FOR:

CHUALAR UNION E.S.

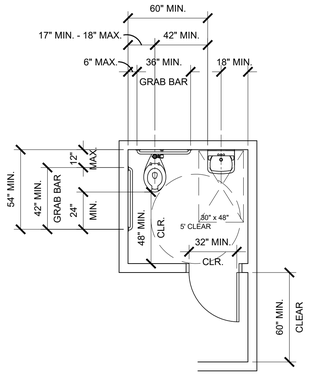
24285 LINCOLN ST. CHUALAR, CA 93925
CHUALAR UNION SCHOOL DISTRICT

REV.	DATE	DESCRIPTION
	06/23/25	1ST PLAN CHECK SUBMITTAL
	10/24/25	1ST PLAN CHECK RE-SUBMITTAL
	01/28/26	2ND BACK CHECK RE-SUBMITTAL

DATE: 05/15/2025
SCALE: AS NOTED
DRAWN: AT
JOB: 24033
SHEET: A6.1

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NOTES:
1. EQUIP THE DOOR INTO THE STALL WITH AUTO CLOSING DEVICE AND PROVIDE A CLEAR OPENING WIDTH OF 34" AT END OF STALL.
2. FLUSH VALVE FOR WATER CLOSET SHALL BE LOCATED ON THE SIDE ACCESSIBLE TO THE WHEELCHAIR.
3. COMPARTMENT DOORS SHALL HAVE A SELF-CLOSING DEVICE WITH U-SHAPED HANDLE.
4. THE INSIDE AND OUTSIDE OF THE COMPARTMENT DOOR SHALL BE EQUIPPED WITH A LOOP OR U-SHAPED HANDLE IMMEDIATELY BELOW THE LATCH. THE LATCH SHALL BE FLIP-OVER STYLE, SLIDING, OR OTHER HARDWARE NOT REQUIRING THE USER TO GRASP OR TWIST.



PLAN VIEW

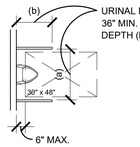
NOTES:
1. MUST HAVE AN OUTWARD SWINGING, SELF-CLOSING DOOR.
2. IF THE DOOR HAS A CLOSER, THEN THE SWEEP PERIOD OF THE CLOSER SHALL BE ADJUSTED SO THAT FROM AN OPEN POSITION OF 70°, THE DOOR WILL TAKE AT LEAST 3 SECONDS TO MOVE TO A POINT 3" FROM THE LATCH, MEASURED TO THE LANDING EDGE OF THE DOOR.

SINGLE ACCOMMODATION RESTROOM
(DIMENSIONS INDICATE MINIMUM/MAXIMUM STANDARDS AND CLEARANCES AND NOT ACTUAL DIMENSIONS)

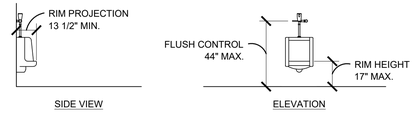
WATER CLOSET:
ALL WATER CLOSETS FOR PUBLIC USE SHALL HAVE ELONGATED BOWLS WITH OPEN FRONT SEATS.

DISPENSERS:
THE OUTLET OF THE DISPENSER SHALL BE BELOW THE GRAB BAR, 19 INCHES MIN. ABOVE F.F. AND SHALL NOT BE LOCATED BEHIND GRAB BARS. DISPENSERS SHALL NOT BE OF A TYPE THAT CONTROLS DELIVERY OR THAT DOES NOT ALLOW CONTINUOUS PAPER FLOW.

FLUSH CONTROLS:
FLUSH CONTROLS SHALL BE HAND OPERATED OR AUTOMATIC. HAND OPERATED FLUSH CONTROLS SHALL BE LOCATED 44 INCHES MAXIMUM ABOVE F.F. FLUSH CONTROLS SHALL BE LOCATED ON THE OPEN SIDE OF THE WATER CLOSET EXCEPT IN AMBULATORY ACCESSIBLE COMPARTMENTS. THE FORCE REQUIRED TO ACTIVATE THE CONTROLS MUST 5 LBS MAX.



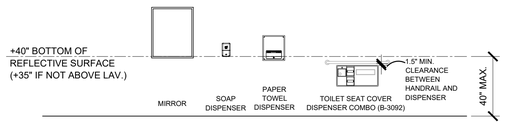
PLAN VIEW



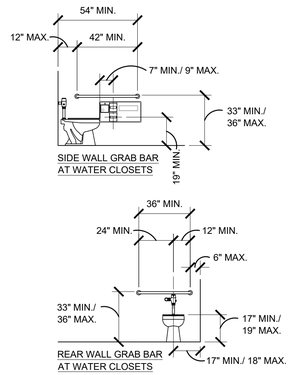
SIDE VIEW ELEVATION

ACCESSIBLE URINAL

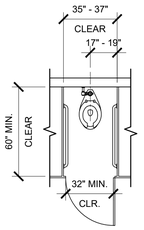
TOILET ROOM ACCESSORIES:
WHERE TOWEL, SANITARY NAPKIN AND WASTE RECEPTACLES AND SIMILAR DISPENSING AND DISPOSAL FIXTURES ARE PROVIDED AT LEAST ONE OF EACH TYPE IS TO BE LOCATED WITH ALL OPERABLE PARTS, INCLUDING COIN SLOTS, WITHIN 40" FROM THE FLOOR.



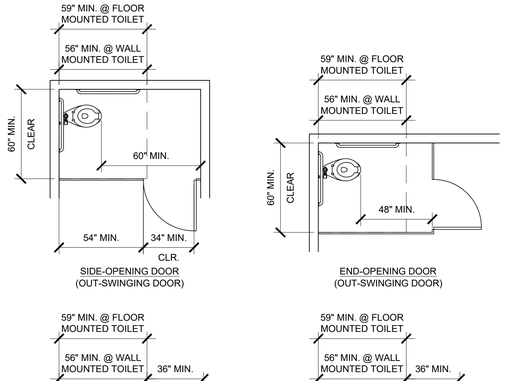
RESTROOM ACCESSORIES
(MAX. 4" PROJECTION, TYP.)



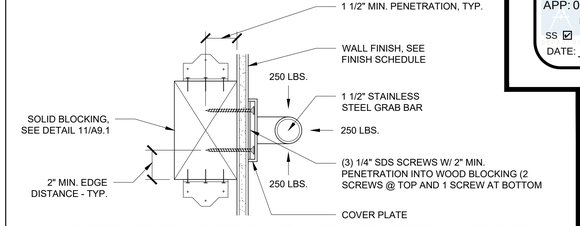
ACCESSIBLE WATER CLOSET ELEVATIONS



AMBULATORY ACCESSIBLE TOILET COMPARTMENT



ACCESSIBLE WATER CLOSET COMPARTMENT MANEUVERING SPACES
MULTIPLE ACCOMMODATION RESTROOM
(DIMENSIONS INDICATE MINIMUM/MAXIMUM STANDARDS AND CLEARANCES AND NOT ACTUAL DIMENSIONS)

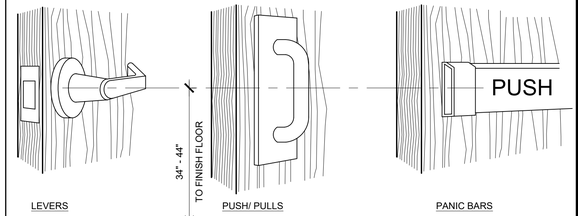


SWINGING DOOR WITHIN 10" OF THE FINISH FLOOR OR GROUND MEASURED VERTICALLY SHALL HAVE A SMOOTH SURFACE ON THE PUSH SIDE EXTENDING THE FULL WIDTH OF THE DOOR OR GATE.

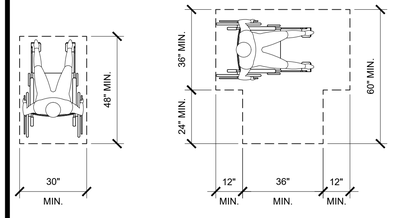
NOTE:
GRAB BAR SHALL BE ABLE TO WITHSTAND A MIN. 250 LB. POINT LOAD.

4 GRAB BAR ANCHORAGE
SCALE: 3" = 1'-0"

NOTES:
1. NO DEADBOLT FOR RESTROOM DOORS. -TYP.
2. EGRESS DOORS SHALL BE READILY OPENABLE FROM THE EGRESS SIDE WITHOUT THE USE OF A KEY OR SPECIAL KNOWLEDGE OR EFFORT.
3. OPERABLE PARTS SUCH AS DOOR HANDLES, PULLS, LATCHES AND LOCKS SHALL BE OPERABLE WITH ONE HAND AND SHALL NOT REQUIRE TIGHT GRASPING, TIGHT PINCHING OR TWISTING OF THE WRIST TO OPERATE. THE FORCE REQUIRED TO ACTIVATE OPERABLE PARTS SHALL BE 5 POUNDS MAXIMUM.
4. SWINGING DOOR WITHIN 10" OF THE FINISH FLOOR OR GROUND MEASURED VERTICALLY SHALL HAVE A SMOOTH SURFACE ON THE PUSH SIDE EXTENDING THE FULL WIDTH OF THE DOOR OR GATE.



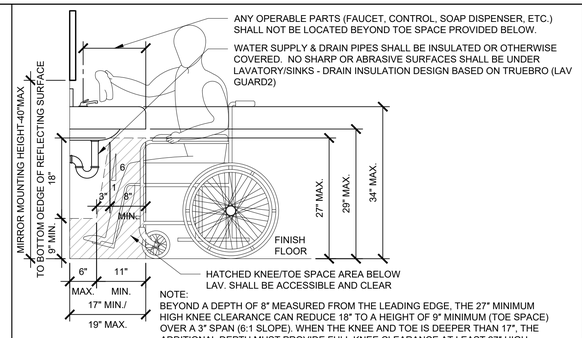
8 DOOR HARDWARE MOUNTING HEIGHT
SCALE: 6" = 1'-0"



CLEAR FLOOR SPACE (FORWARD APPROACH OR PARALLEL APPROACH) | T SHAPED TURNING SPACE | CIRCULAR TURNING SPACE

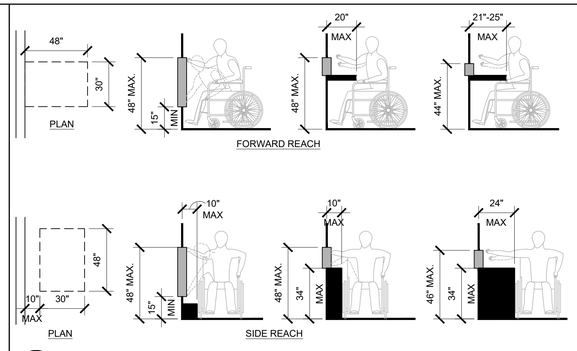
1. PROVIDE MINIMUM CLEAR FLOOR SPACE AT ALL ACCESSIBLE LOCATIONS AND FIXTURES.
2. UNLESS SPECIFICALLY NOTED, THE CLEAR FLOOR AND TURNING SPACE SHALL BE UNOBSTRUCTED TO A MINIMUM HEIGHT OF 80". ACCESSIBLE DESKS, COUNTERS, SINKS, DRINKING FOUNTAINS AND SIMILAR CONDITIONS ALLOW THE CLEAR FLOOR SPACE TO OVERLAP THE ACCESSIBLE FURNITURE OR FIXTURE AS LONG AS THE MINIMUM REQUIRED KNEE AND TOE CLEARANCES ARE PROVIDED.

9 CLEAR FLOOR AND TURNING SPACE FOR ACCESSIBILITY
SCALE: 3/8" = 1'-0"



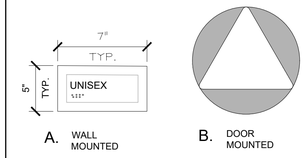
NOTE:
BEYOND A DEPTH OF 8" MEASURED FROM THE LEADING EDGE, THE 27" MINIMUM HIGH KNEE CLEARANCE CAN REDUCE 18" TO A HEIGHT OF 9" MINIMUM (TOE SPACE) OVER A 3" SPAN (6:1 SLOPE). WHEN THE KNEE AND TOE IS DEEPER THAN 17", THE ADDITIONAL DEPTH MUST PROVIDE FULL KNEE CLEARANCE AT LEAST 27" HIGH.

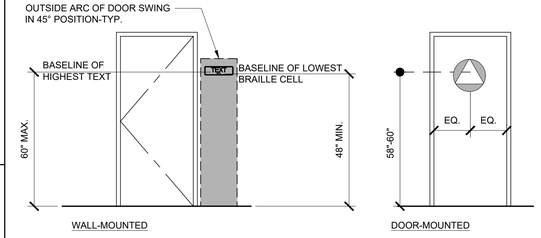
10 ACCESSIBLE LAVATORY CLEARANCES
SCALE: 3/4" = 1'-0"

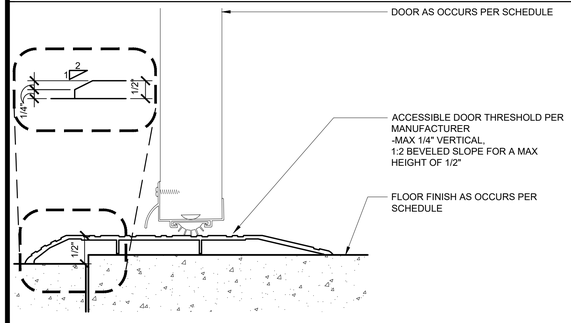


11 ACCESSIBLE REACH RANGES
SCALE: 1/4" = 1'-0"

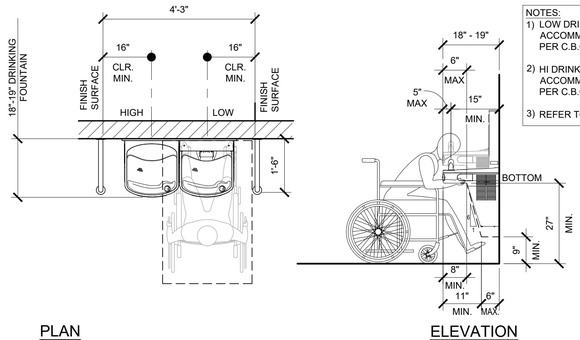
A0_007





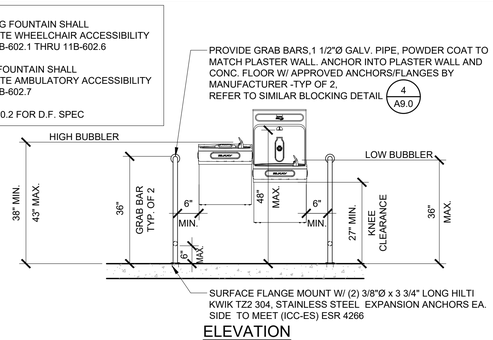


13 ACCESSIBLE THRESHOLD
SCALE: 6" = 1'-0"



PLAN | ELEVATION

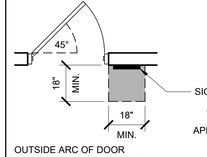
NOTES:
1) LOW DRINKING FOUNTAIN SHALL ACCOMMODATE WHEELCHAIR ACCESSIBILITY PER C.B.C. 11B-602.1 THRU 11B-602.6
2) HI DRINKING FOUNTAIN SHALL ACCOMMODATE AMBULATORY ACCESSIBILITY PER C.B.C. 11B-602.7
3) REFER TO MP0.2 FOR D.F. SPEC



ELEVATION

14 ACCESSIBLE HIGH-LOW DRINKING FOUNTAIN
SCALE: 1/2" = 1'-0"

A0_010



INSPECTION NOTES: SIGNS AND IDENTIFICATION DEVICES SHALL BE FIELD INSPECTED AFTER INSTALLATION AND APPROVED BY THE ENFORCING AGENCY PRIOR TO THE ISSUANCE OF A FINAL CERTIFICATE OF OCCUPANCY PER CHAPTER 1, DIVISION II, SECTION III, OR FINAL APPROVAL WHERE NO CERTIFICATION OF OCCUPANCY IS ISSUED. THE INSPECTION SHALL INCLUDE, BUT NOT LIMITED TO, VERIFICATION THAT BRAILLE DOTS AND CELLS ARE PROPERLY SPACED AND THE SIZE, PROPORTION AND TYPE OF RAISED CHARACTERS ARE IN COMPLIANCE WITH THESE REGULATIONS.

16 SIGNAGE PICTOGRAMS & MOUNTING REQUIREMENTS
SCALE: N.T.S.

IDENTIFICATION STAMP
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REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 02/11/2026

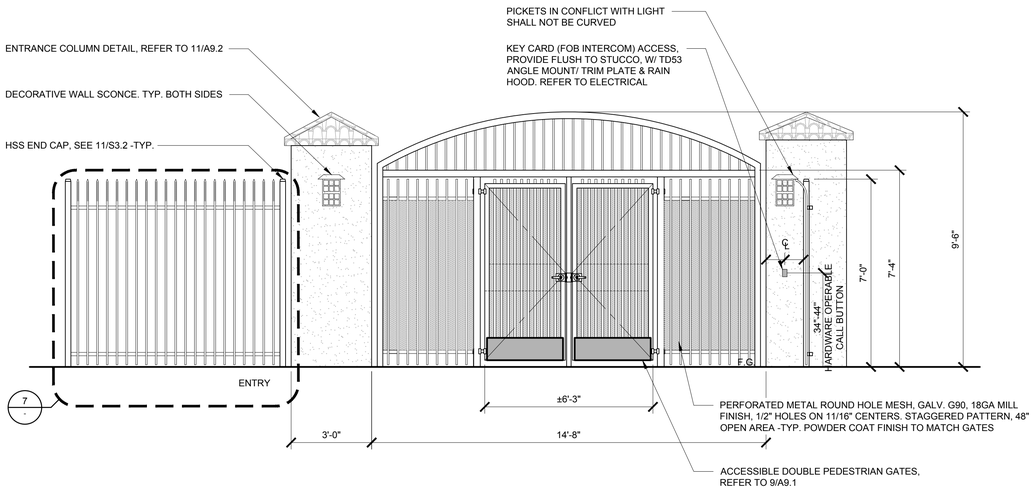
Peartree+Belli
ARCHITECTS
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CODE COMPLIANCE AND SIGNAGE DETAILS
TRACK + FIELD REPLACEMENT AND NEW RESTROOM BUILDING FOR:
CHUALAR UNION E.S.
24285 LINCOLN ST. CHUALAR, CA 93925
CHUALAR UNION SCHOOL DISTRICT

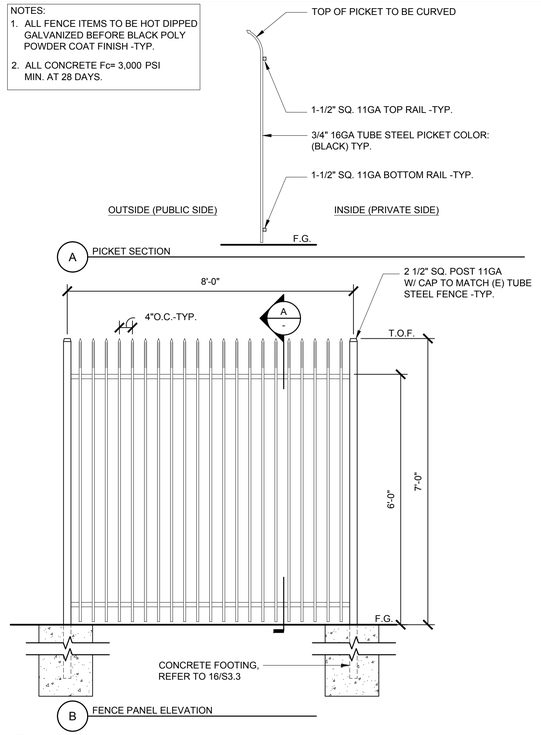
REV.	DATE	DESCRIPTION
	06/23/25	1ST PLAN CHECK SUBMITTAL
	10/24/25	1ST PLAN CHECK RE-SUBMITTAL
	01/28/26	2ND BACK CHECK RE-SUBMITTAL

DATE: 05/15/2025
SCALE: AS NOTED
DRAWN:
JOB: 24033
SHEET: A9.0

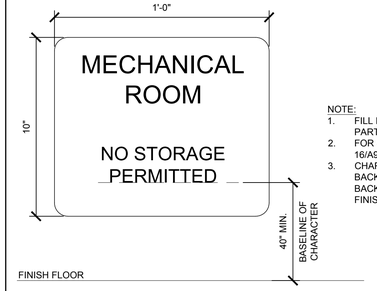


5 ACCESSIBLE ENTRANCE GATE (DECORATIVE)
SCALE: 3/8" = 1'-0"

NOTES:
1. ALL FENCE ITEMS TO BE HOT DIPPED GALVANIZED BEFORE BLACK POLY POWDER COAT FINISH -TYP.
2. ALL CONCRETE Fc= 3,000 PSI MIN. AT 28 DAYS.



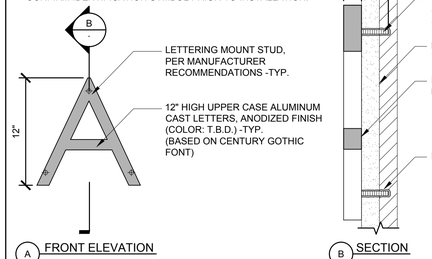
7 TUBE STEEL FENCE -TYP. PANEL
SCALE: 1/2" = 1'-0"



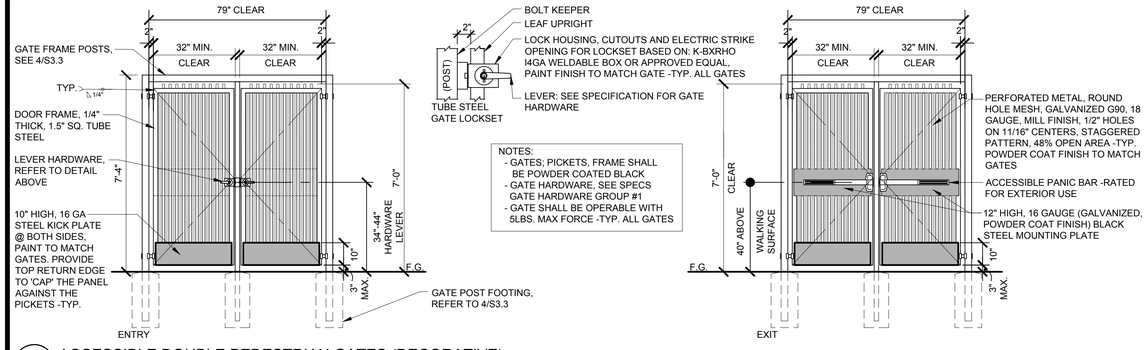
NOTE:
1. FILL IN APPLICABLE TEXT AS PERMANENT PART OF SIGNAGE.
2. FOR SIGNAGE REQUIREMENTS SEE DETAIL 16/A9.0 FOR SIMILAR CONDITION
3. CHARACTERS SHALL CONTRAST WITH THEIR BACKGROUND. CHARACTERS AND BACKGROUND SHALL HAVE A NON-GLARE FINISH

4 MECHANICAL ROOM SIGNAGE
SCALE: 3" = 1'-0"

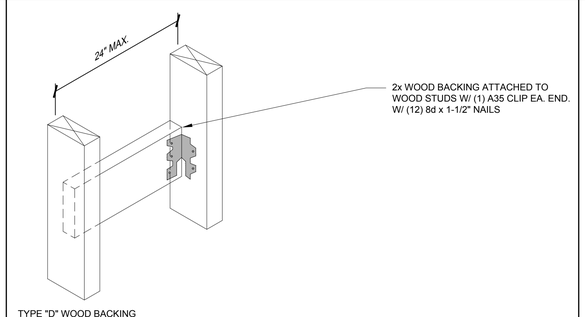
NOTES:
1. PLASTER WALL FINISH. COORDINATE INSTALLATION DETAILS/LOCATION WITH ARCHITECT AND DISTRICT PRIOR TO INSTALLATION.
2. BUILDING IDENTIFICATION LETTER "Q" SHOWN. DISTRICT TO CONFIRM IDENTIFICATION SYMBOL PRIOR TO INSTALLATION.



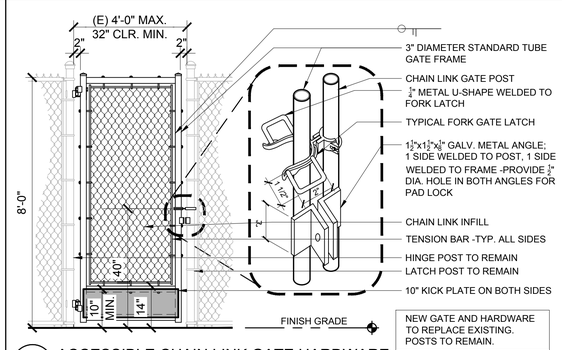
8 BUILDING IDENTIFICATION SIGNAGE
SCALE: N/A



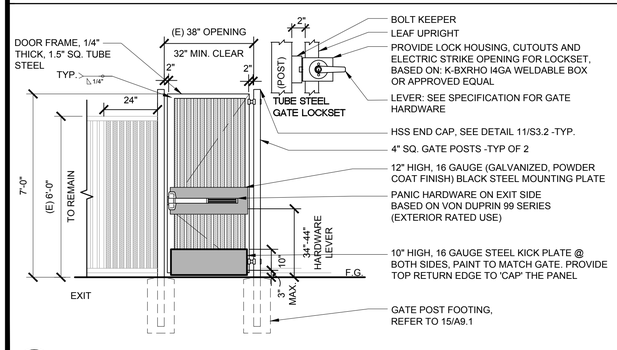
9 ACCESSIBLE DOUBLE PEDESTRIAN GATES (DECORATIVE)
SCALE: 3/8" = 1'-0"



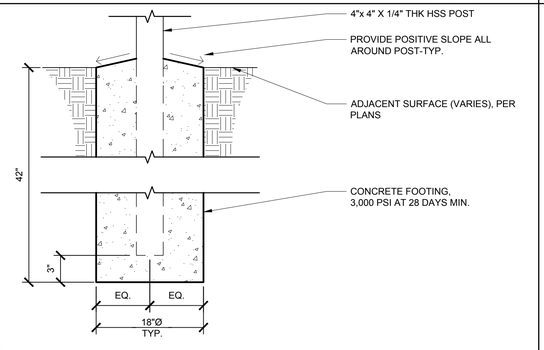
11 TYPICAL BLOCKING
SCALE: 1-1/2" = 1'-0"



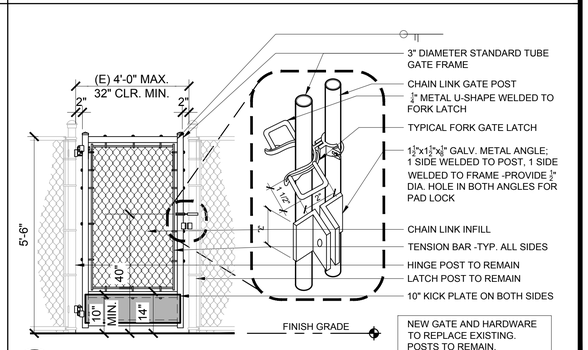
12 ACCESSIBLE CHAIN LINK GATE HARDWARE
SCALE: 1/2" = 1'-0"



13 ACCESSIBLE PEDESTRIAN GATE (DECORATIVE)
SCALE: 3/8" = 1'-0"



15 PEDESTRIAN GATE POST FOOTING
SCALE: 1-1/2" = 1'-0"



16 ACCESSIBLE CHAIN LINK GATE HARDWARE
SCALE: 1/2" = 1'-0"

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APP: 01-122444 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 02/11/2026

Peartree+Belli
ARCHITECTS
235 MONTEREY ST., SUITE B
SALINAS, CA 93901
(831) 424-4620
PEARTREEBELLI.COM

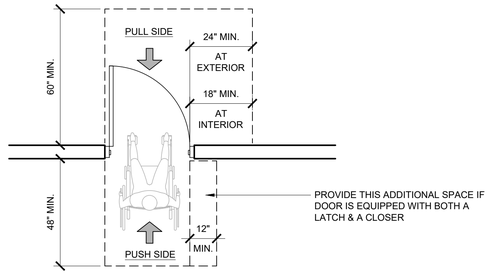
DAVID PETER BELLI
LICENSED ARCHITECT
C-30852
Exp. 12/31/27
STATE OF CALIFORNIA

SITE DETAILS
TRACK + FIELD REPLACEMENT AND NEW RESTROOM BUILDING FOR:
CHUALAR UNION E.S.
24285 LINCOLN ST. CHUALAR, CA 93925
CHUALAR UNION SCHOOL DISTRICT

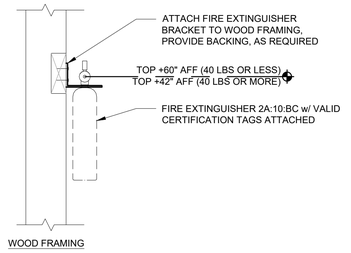
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	06/23/25	1ST PLAN CHECK SUBMITTAL
	10/24/25	1ST PLAN CHECK RE-SUBMITTAL
	01/28/26	2ND BACK CHECK RE-SUBMITTAL

DATE: 05/15/2025
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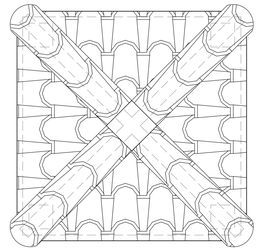


3 FRONT APPROACH ACCESSIBLE DOOR CLEARANCE
SCALE: 3/8" = 1'-0"

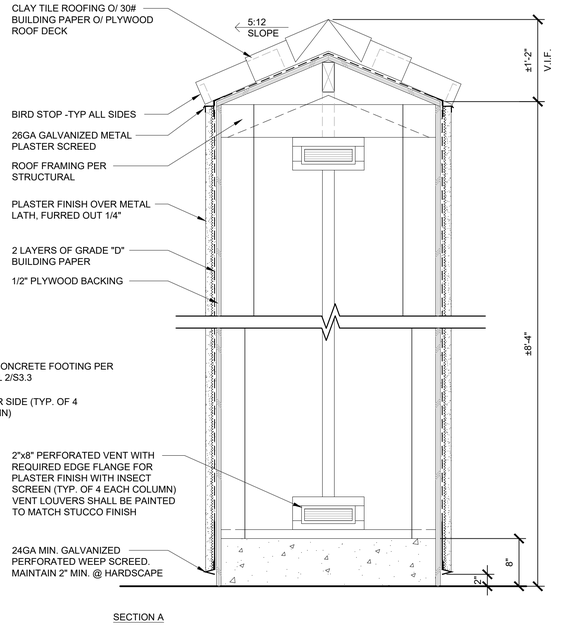


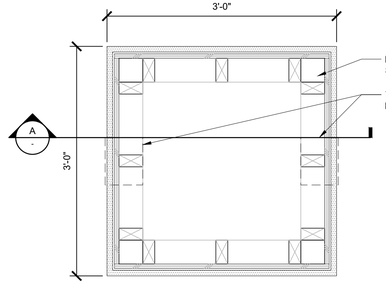
NOTE:
(1) PER 3,000 SF OR FRACTION THEREOF; MAX. TRAVEL DISTANCE 75'-0".

4 FIRE EXTINGUISHER (BRACKET MOUNTED)
SCALE: 1" = 1'-0"



ROOF PLAN

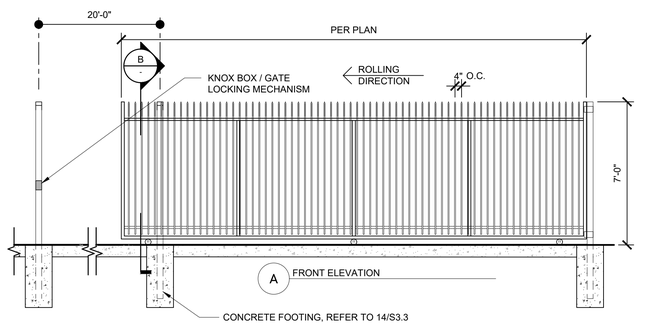


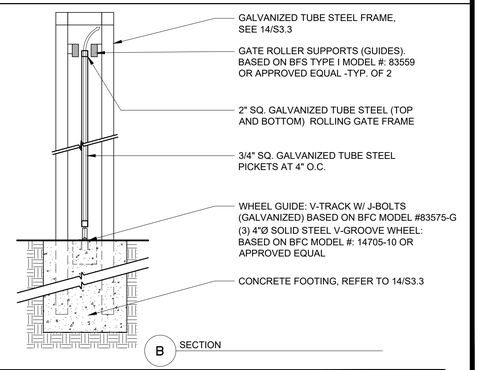


PLAN

SECTION A

11 ENTRANCE COLUMN DETAIL
SCALE: 1" = 1'-0"





15 TUBE STEEL ROLLING GATE DETAIL
SCALE: 1/4" = 1'-0"

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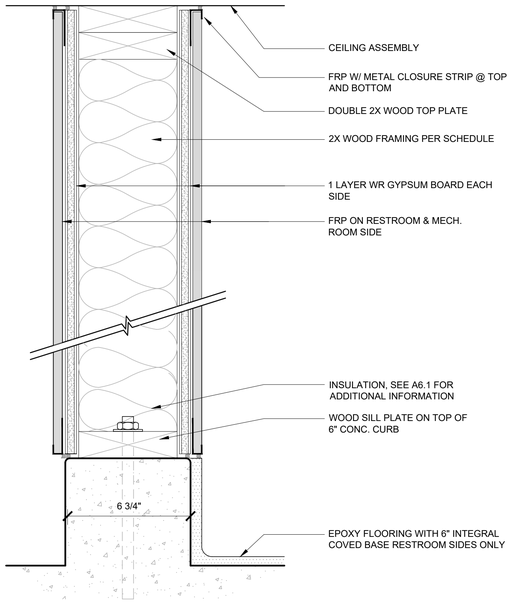
SITE DETAILS

TRACK + FIELD REPLACEMENT AND NEW RESTROOM BUILDING FOR:
CHUALAR UNION E.S.
24285 LINCOLN ST. CHUALAR, CA 93925
CHUALAR UNION SCHOOL DISTRICT

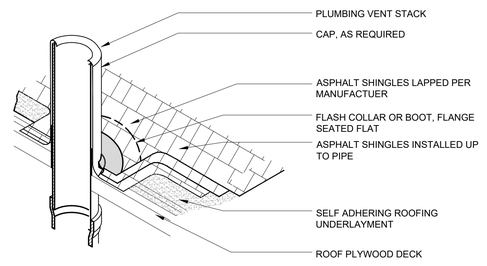
REV.	DATE	DESCRIPTION
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	10/24/25	1ST PLAN CHECK RE-SUBMITTAL
	01/28/26	2ND BACK CHECK RE-SUBMITTAL

DATE: 05/15/2025
SCALE: AS NOTED
DRAWN: AT
JOB: 24033
SHEET: A9.2

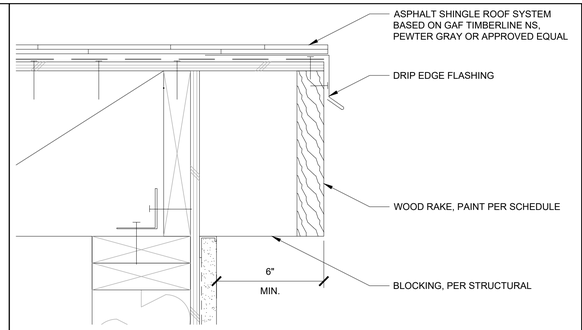
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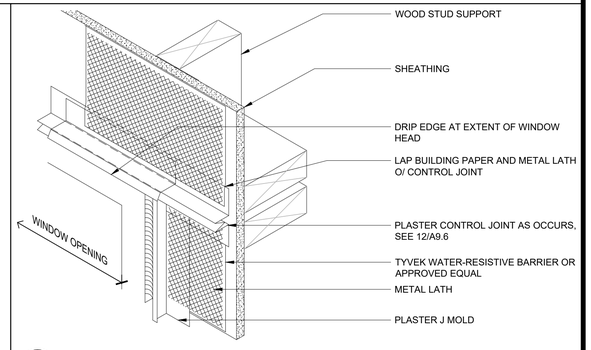
5 INTERIOR WALLS AT RESTROOMS/MECH. ROOM
SCALE: 3" = 1'-0"



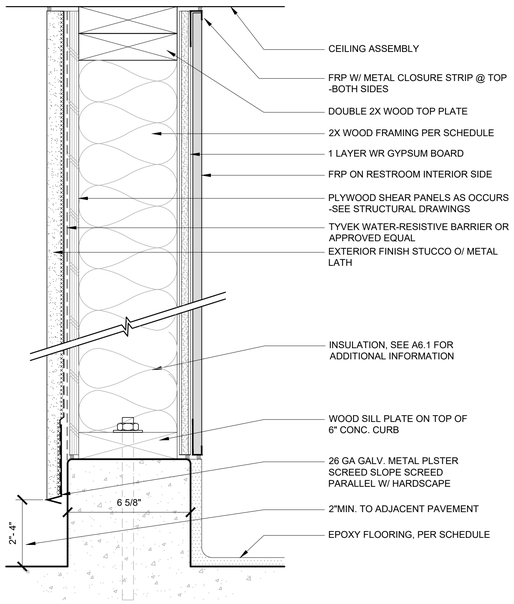
6 PLUMBING VENT FLASHING
SCALE: 1-1/2" = 1'-0"



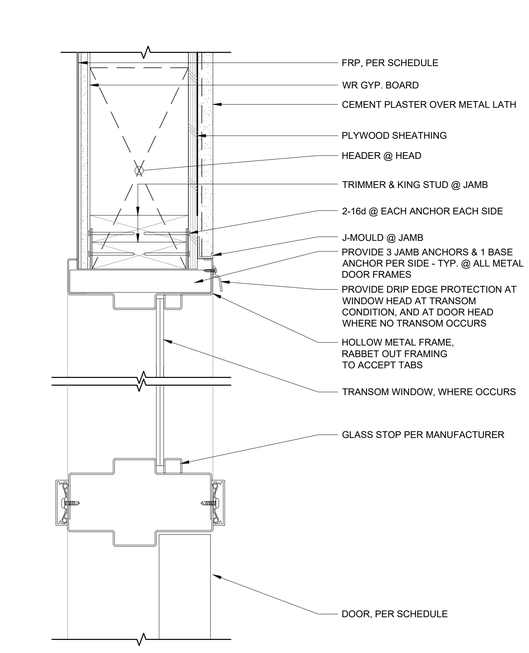
7 RAKE
SCALE: 3" = 1'-0"



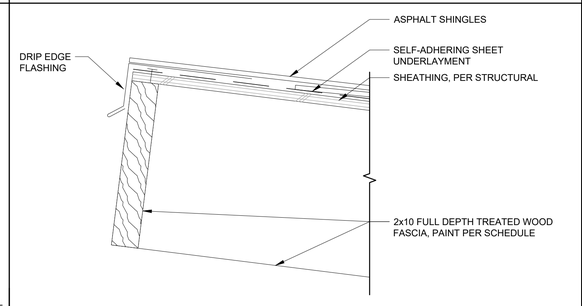
8 PLASTER CONTROL JOINT AT WINDOW
SCALE: 3" = 1'-0"



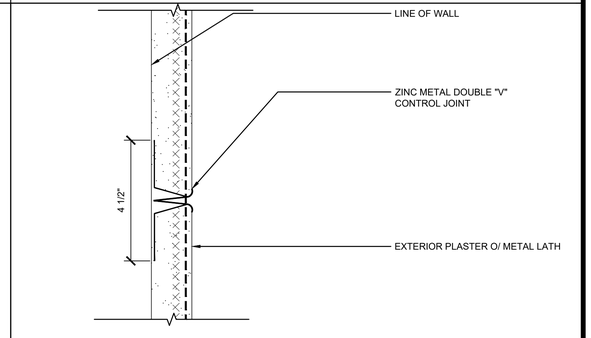
13 EXTERIOR WALLS AT RESTROOMS
SCALE: 3" = 1'-0"



14 H.M. FRAME HEAD/JAMB @ EXTERIOR WALL
SCALE: 3" = 1'-0"

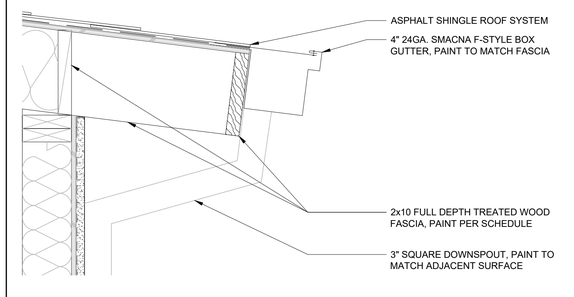


11 UPPER EAVE
SCALE: 3" = 1'-0"

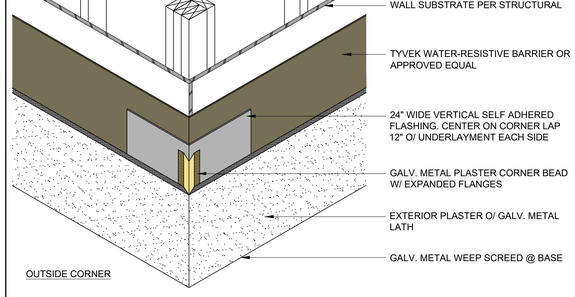


12 EXTERIOR PLASTER CONTROL JOINTS
SCALE: 3" = 1'-0"

EXT_017



15 LOWER EAVE
SCALE: 1-1/2" = 1'-0"



16 CONTROL JOINTS AT CORNERS
SCALE: 1" = 1'-0"

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EXTERIOR DETAILS

TRACK + FIELD REPLACEMENT AND NEW RESTROOM BUILDING FOR:
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CHUALAR UNION SCHOOL DISTRICT

REV.	DATE	DESCRIPTION
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CHUALAR UNION E.S.
NEW RESTROOM BUILDING

24285 LINCOLN ST.
CHUALAR, CA 93925

SPECIAL INSPECTIONS

SEE DSA FORM 103-22 FOR ADDITIONAL LIST OF STRUCTURAL TESTS AND SPECIAL INSPECTIONS

ADDITIONAL SPECIAL INSPECTIONS: SEISMIC RESISTANCE*

(per CBC 1705A, 1707A, 1705A.13)

VERIFICATION AND INSPECTION TASK	CONTINUOUS	PERIODIC
THESE INSPECTIONS APPLY TO DESIGNATED SEISMIC SYSTEMS AND OTHER ELEMENTS AS LISTED BELOW:		
1. Structural wood (per 1705A.13.2):		
a. Field gluing operations of wood elements of the seismic-force-resisting system.	X	–
b. Nailing, bolting, anchoring and other fastening of components within the seismic-force resisting system, including wood shear walls, wood diaphragms, drag struts, braces, shear panels and holdowns.	–	X

ADDITIONAL NOTES

See Architectural, Mechanical, Electrical, and other plans for additional required non-structural special inspections.

CBC 1704A.2.1: The special inspector shall be a qualified person who shall demonstrate competence, to the satisfaction of the building official, for inspection of the particular type of construction or operation requiring inspection. The special inspector shall provide written documentation to the building official demonstrating his or her competence and relevant experience or training. Experience or training shall be considered relevant when the documented experience or training is related in complexity to the same type of special inspection activities for projects of similar complexity and material qualities. These qualifications are in addition to qualifications specified in other sections of this code.

CBC 1705A.1.1: Special inspections shall be required for proposed work that is, in the opinion of the building official, unusual in its nature, such as, but not limited to, the following examples:

1. *Construction materials and systems that are alternatives to materials and systems prescribed by the CBC.*
2. *Unusual design applications of materials described in the CBC.*
3. *Materials and systems required to be installed in accordance with additional manufacturer's instructions that prescribe requirements not contained in this code or in standards referenced by the CBC.*

The special inspector shall observe the work assigned for conformance with the approved design drawings, approved specifications, and the applicable workmanship provisions of the CBC. The special inspector shall furnish inspection reports to the building official, the engineer or architect of record, and other designated persons as directed in Chapter 17A of the CBC. All discrepancies shall be brought to the immediate attention of the contractor for correction and then, if uncorrected, to the appropriate design authority and to the building official.

CBC 1704A.4 and 1704A.2.3: Each contractor responsible for the construction of a main wind or seismic force resisting system, designated seismic system or a wind- or seismic-resisting component listed in the statement of special inspections shall submit a written statement of responsibility to the building official and the owner prior to the commencement of work on the system or component. The contractor's statement of responsibility shall contain acknowledgment of awareness of the special requirements contained in the statement of special inspection.

STRUCTURAL OBSERVATION SCHEDULE AND NOTES

STRUCTURAL OBSERVATION
(checked items are required)

Frequency: Prior to Foundation or Framing Inspection By Building Inspector Unless Indicated Otherwise.

FOUNDATION	WALL	FRAME	DIAPHRAGM
[X] Footing, Stem Walls, Floor Slab	☐ Concrete	☐ Steel Moment Frame	☐ Concrete
☐ Mat Foundation	☐ Masonry	☐ Steel Braced Frame	☐ Steel Deck
☐ Caissons, Piles, Grade Beams	[X] Wood **Plywood SW**	☐ Concrete Moment Frame	[X] Wood **Roof**
☐ Hillside, Retaining	☐ Other: (List)	☐ Masonry Wall Frame	☐ Other: (List)
☐ Special Anchors		☐ Other: (List)	
☐ Other: (List)			

Construction Stage	Elements/Connections to be Observed
a) Prior to Concrete Pour.	Rebar, Anchorages, and Holdowns
b) Prior to Covering Plywood Shearwalls.	Plywood SW Lengths, Nailing, and Shear Transfers
c) Prior to Covering Roof Diaphragm.	Roof Framing, Diaphragm Nailing, and Shear Transfers

The contractor shall request structural observation site visits to be performed at those steps in the progress of the work that allow for correction of deficiencies without substantial effort or uncovering of the work involved. At a minimum, the construction stages listed above require a site visit and an observation report by a registered design professional (structural observer).

GENERAL NOTES

1. The notes on this Title Sheet apply to and are in effect for all parts of the project, unless noted otherwise. Refer to the Structural Specifications on Sheet S0.2 & 0.3, and in a separate specifications book for additional structural requirements. Refer to the drawings, notes, and specifications of the Architect, and other consultants for additional requirements.
2. Do not scale these drawings. Refer to written dimensions. Drawings are not necessarily to scale. The Contractor is to use architectural dimensions to lay out walls, framing, foundations, and other elements. The Contractor is to verify all dimensions and conditions and report any discrepancies to the Architect prior to commencing with any directly or indirectly related work.
3. T&S Structural's details are prepared to convey only structural aspects of each element shown. Non-structural information, including but not limited to fenestrations, fire-resistance, insulation, finishes, waterproofing, drainage, and flashing may not be included on the structural plans. The Contractor must obtain non-structural information related to each detail from the Architect, architectural plans, and plans provided by other consultants. Brace equipment per the manufacturer's specifications.
4. No deviations from these structural plans, details, and specifications are allowed without written approval from T&S Structural. Approval by an inspector or any other party does not constitute authority to deviate from these plans. Plan changes and addenda are subject to approval by the Division of the State Architect (DSA). The Contractor is responsible for processing changes, assembling permit documents, acquiring permits, and obtaining Owner approval for costs related to change orders.
5. Substitutions of specified products (i.e. Simpson Strong-Tie) for equivalent products are not recommended. Substitutions will be considered if the Contractor agrees to this procedure prior to substitutions being made: (a) Contractor provides T&S Structural with satisfactory evidence of product equivalence; (b) If satisfactory, Contractor agrees to reimburse T&S Structural for time and expenses to revise plans; and (c) Contractor agrees to resubmit plans to the DSA for approval.
6. Construction and materials must comply with and be installed in accordance with the requirements of all legally-constituted public authorities having jurisdiction, including all county, city, and local ordinances, as well as the Safety Orders of the State Industrial Accident Commission, OSHA. Receive all required approvals prior to commencement of construction.
7. The Structural Engineer is not responsible for and does not have control or charge of construction means, methods, techniques, sequences, or procedures, or for safety precautions and programs in connection with the construction delineated by these plans. The Contractor or his/her agent(s) are responsible to supervise and direct all work and are solely and completely responsible for all construction means, methods, techniques, sequences, procedures, and conditions on the job site, including the safety of all persons and property during the entire period of construction. Periodic observations by T&S Structural personnel or representatives are not intended to include verification of dimensions or review the adequacy of the Contractor's safety measures on or near the construction site.
8. The Contractor is responsible to provide all shoring and bracing during construction to support all loads to which the structure and site may be subjected. Provide shoring for vertical cuts in excess of 5 feet per OSHA and DSA and as directed by the Soils Engineer.
9. Where inspection is required, the Special Inspector is to obtain DSA approval prior to work commencement. Copies of the inspection report(s) to be filed by the Special Inspector(s) must be given to the architect, structural engineer, owner, and DSA. The Contractor is responsible for scheduling, coordination, and expenses involved in any and all inspections.
10. The Contractor is responsible to initiate a resolution to any conflicts within or between drawings, specifications, and/or manufacturer instructions by issuing an RFI. The most strenuous and/or costly option governs unless otherwise stated in response to an RFI. It is the Contractor's responsibility to identify and provide for any 'scope gaps' that may exist and be recognizable to a professional building contractor.
11. Each contractor responsible for the construction of a wind- or seismic-force-resisting system or component listed in the "Statement of Special Inspections" must submit a written statement of responsibility to DSA and the owner prior to the commencement of work on the system or component. (See CBC Section 1704A.4 for specific requirements.)
12. "Clouding" shown on the construction documents is only for convenience for general major revisions and is not necessarily inclusive of all revisions to the drawings. The Contractor and others must review the construction documents completely and thoroughly and are not to depend upon the clouding being an indication of the full limit or extent of revisions.
13. All construction projects require inspection and maintenance following completion. Operation, inspection, and maintenance are the sole responsibility of the Owner. T&S Structural has no responsibility for any failures by the Owner or others to properly operate, inspect, or maintain the project(s) shown in these plans.
14. Where plans, details, notes, and/or specifications (construction documents) are noted as being in a preliminary/progress state (e.g. "not for construction"), the Contractor must take this into consideration if choosing to use these progress documents for cost estimating, bidding, or any other purpose.
15. The plans, calculations, and specifications contained herein and provided herewith are the exclusive property of T&S Structural, © 2026. The use of these plans and specifications is restricted to the original site for which they were prepared and publication thereof is expressly limited to such use. Reproduction or publication by any method, in whole or in part, is prohibited. Title to these plans and specifications remains with T&S Structural without prejudice. Visual contact with these plans and specifications constitutes prima facie evidence of the acceptance of these restrictions.

STRUCTURAL DESIGN PARAMETERS

GENERAL PARAMETERS

Building Code	2022 CBC Title 24
Construction Type	Type V
Risk Category	II
Number of Stories	1
Max. Height (above grade)	11 ft
Roof DL/LL (psf)	13/20
Rain Intensity i (in/hr) (per CBC Fig. 1611A.1)	0.87

SEISMIC DESIGN DATA (per CBC 1603A.1.5):

Risk Category	II
Seismic Importance Factor, I	1.00
Site Class	D, Default
Spectral Response Accelerations	S_S = 1.688 S_1 = 0.586
Spectral Response Coefficients	S_{DS} = 1.351 S_{D1} = 0.670
Seismic Design Category	D
Seismic Force Resisting System: - Light-frame (wood) walls sheathed with wood structural panels rated for shear resistance	
Response Modification Factor, R	6.5
Seismic Response Coefficient, C_s	0.208
Design Base Shear (1.0E ~ C_sW)	1.4 kips
Redundancy Factor, ρ	1.3
Analysis Procedure Used	Equiv. Lat. Force

SOILS VALUES

Bearing Pressure	2000 psf
Lateral Passive	300 pcf
Friction	0.35
Soil Classifications	Silty Sand (SM)

WIND DESIGN DATA (per CBC 1603A.1.4):

Basic Wind Speed, V	95 mph
Exposure Category	C

Soils work must conform to the requirements and recommendations of the Geotechnical Report: "Supplemental Geotechnical Engineering Recommendations for Chualar Elementary School Turf Replacement & Restroom Building Project" for 24285 Lincoln Street, Chualar, California by Ajay Singh of Earth Systems, dated April 1, 2025 Project No. 306771-001, including all subsequent letters and addenda.

STANDARD ABBREVIATIONS

AB	anchor bolt
Abv.	above
A/C	air conditioning
Add'l	additional addendum
Add'm	addendum
Adj.	adjacent, adjustable
AFF	above finished floor
AISC	American Institute of Steel Construction
Alum.	aluminum
Alt.	alternate
APA	American Plywood Council
Approx.	approximate
Arch.	architect (ural)
ASTM	American Society of Testing & Materials
Auto.	automatic
Avg.	average
AWS	American Welding Society
Bd.	board
Bldg.	building
Blk(g).	block (ing)
Blw.	below
Bm.	beam
Bn	boundary nailing
Bot.	bottom
BP	base plate
Brg.	bearing
Btwn.	between
BW	both ways
Cant.	cantilever (ed)
CBC	California Building Code grade
CDX	C-D plywood w/ exterior glue
Cem.	cement
CHBC	California Historic Building Code
CIP	cast-in-place
CJ	ceiling joist (s)
CJP	complete joint penetration
CL	center line
Clg.	ceiling
Clr.	clear (ance)
CM	centimeter (s)
CMU	concrete masonry unit
Coeff.	coefficient
Col.	column
Com.	common
Conc.	concrete
Conn.	connect (ion)
Const.	construction
Cont.	continuous, continue
Contr.	contractor
Corr.	corrugated
Ctr.	center
Ctrsk.	countersink
Cu.	cubic
d	penny (nails)
Dbl.	double
Deg.	degree
Demo	demolish, demolition
Dep.	depressed
DF	Douglas Fir
Dia(m).	diameter
Diag.	diagonal
Dim.	dimension (s)
Dist.	distance
Div.	division, divider
DJ	deck joist (s)
DL	dead load
Dn.	down
DSA	Division of the State Architect
Dwg.	drawing
(E)	existing
Ea.	each
EF	each face
EFP	effective fluid pressure
El.	elevation (grade)
Elec.	electric (al)
Elev.	elevator, elevation
Embed.	embedded, embedment
EN	edge nail (ing)
Encl.	enclose (d), (ure)
Eng(r).	engineer (ed)
Eq. or EQ	equal
Equip.	equipment
Equiv.	equivalent
ES	each side
Est.	estimate (d)
Etc.	et cetera
EW	each way
EWEF	each way each face
Exist.	existing
Exp.	expand, expansion
Ext.	exterior, extended
Fdn.	foundation
FF	finished floor
FG	finished grade
Fin.	finish (ed)
FJ	floor joist (s)
Fl.	flange
Flr(g).	floor (ing)
FN	field nail (ing)
FOC	face of concrete
FOM	face of masonry
FOP	face of panel
FOS	face of steel (stud)
FP	fireplace
FR	fire rate (d), (ing)
Frmg.	framing
FS	far side
Ft.	foot, feet
Ftg.	footing
Fut.	future
Ga.	gage, gauge
Galv.	galvanized
GB	grade beam
GC	general contractor
Gen.	general
Gl.	glass, glazing, glazed
GLB	glue-laminated beam
Gr.	grade, grading
Gyp.	gypsum
HD	holdown
HDG	hot-dip galvanized
Hdr.	header
Hex	hexagonal
Hgr.	hanger
Hor (iz).	horizontal
HS	high strength
HSS	hollow structural section
Ht.	height
HVAC	Heating / Ventilation / Air Conditioning
IBC	International Building Code
ICC	International Code Council
ICC-ES	ICC Evaluation Service
ID	inside diameter
In.	inch (es)
Incl.	include (d), (s), (ing)
Info	information
Insp.	inspect (ion), (or)
Insul.	insulate (d), (ion)
Instl.	installation, install
Int.	interior
Inv.	invert (ed)
Jst.	joist
K	kip (1000 pounds)
KLF	kips per linear foot
KP	king post
KSF	kips per square foot
KSI	kips per square inch
LABC	Los Angeles City Building Code
Lam.	laminate (d), (tion)
LARR	Los Angeles Research Report
Lb(s).	pound (s)
Lg.	large
LF	linear (l) foot
Lin.	linear, lineal
LL	live load
LLH	long leg horizontal
LLV	long leg vertical
Long.	longitudinal
Lt(g).	light (ing)
Lwt.	lightweight
LVL	laminated veneer lumber
LWC	lightweight concrete
Mas.	masonry
Mat'l	material
Max.	maximum
Mbr.	member
Mech.	mechanic (al)
Med.	medium
MEP	Mech./Elec./Plumbing
Mezz.	mezzanine
MF	moment frame
Mfr.	manufacture (r)
Min.	minimum, minute (s)
Misc.	miscellaneous
MM	millimeter (s)
Mod.	modify, modified, modular
MS	machine screw
Mtl.	metal
(N)	new
N	north
N/A	not applicable
Nat.('l)	natural, national
NDS	National Design Specification for Wood Construction
Neg.	negative
NIC	not in contract
No.	number
Nom.	nominal
NS	near side
NSA	nelson stud anchor
NSG	non-shrink grout
NTS	not to scale
o.c. or oc	on center (s)
OD	outside diameter
OMF	ordinary moment frame
Opp.	opposite
OSB	oriented strand board
OSHPD	Office of Statewide Health Planning & Development
OT	overturning
Par.	parallel
PCF	pounds per cubic foot
Pen.	penetrate (ion)
Perf.	perforate (d), (tion)
Perim.	perimeter
Perp.	perpendicular
PJP	partial joint penetration
Pl.	plate
PL.	property line
PLF	pounds per linear foot
Ply(wd).	plywood
Prefab.	prefabricated (ion)
Prelim.	preliminary
Proj.	project
Prop.	propery
PSF	pounds per square foot
PSI	pounds per square inch
PSL	parallel strand lumber
PT	pressure-treated, post tension (ed)
Pt.	point
PV	photovoltaic
Qtr.	quarter
Qty.	quantity
R(ad).	radius
Rd.	road
Rdwd.	redwood
Rebar	reinforcing bar (s)
Rec('d).	receive (d)
Rect.	rectangular
Ref.	reference
Reinf.	reinforce (d), (ing), (ment)
Req('d).	require (d), (ment)
Ret.	retain (ing)
Rev.	revision (s), revised
RJ	roof joist (s)
Rm.	room
RO	rough opening
RR	roof rafter (s)
SAD	see architectural drawings
Sched.	schedule
SE	structural engineer
Shtg.	sheathing
Sim.	similar
SMF	special moment frame
SMS	sheet metal screw
SOG	slab on grade
Spec(s)	specifications (s)
Sq. or SQ	square
SS	grade select structural, stainless steel
ST	self-tapping
ST1	grade Structural 1 panel
Std(s).	standard (s)
St(l).	steel
Str(uct).	structural, structure
Surf.	surface
Susp.	suspended
SW	shearwall
Sym.	symmetry (ical), symbol
Syn.	synthetic
T&B	top and bottom
T&G	tongue and groove
Temp.	temporary, tempered
Th(k).	thick, thickness
Thru	through
T.O.	top of
TOB	top of beam
TOC	top of concrete
TOF	top of footing
TOG	top of grade
Tol.	tolerance
TOP	top of plate
TOS	top of slab, top of steel
TOW	top of wall
Trans.	transverse
Trim.	trimmer stud (s)
Typ.	typical
UBC	Uniform Building Code
UNO	unless note otherwise
Util.	utility (ies)
Var.	varies, varnish
Vent.	ventilate (ion), (or)
Vert.	vertical
VIF	verify in field
Vol.	volume
W	width, wide, water
W/	with
Wd.	wood
WF	wide flange
WiN	within
Win.	window
W/O	without
WP	waterproofing (ing)
WS	wood screw
Wt.	weight
WTS	welded threaded stud
WHS	welded headed stud
WWF	welded wire fabric
WWM	welded wire mesh
Yd.	yard
∠	angle
@	at
∇	delta
Ø	diameter
#	number, pound (s)
/	per
+/-	plus or minus

SHEET INDEX

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DSA:

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Checked By: NBW
Scale: -
Job No: 240434

Sheet Title:
STRUCTURAL TITLE SHEET

Sheet No.:
S0.1

SECTION 033000 – CAST-IN-PLACE CONCRETE

PART 1 – GENERAL

1.1 SUMMARY:

A. Work Includes: Concrete construction, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes for the following concrete elements: foundations, pad footings, continuous footings, gradebeams, tie beams, and piers; retaining walls; structural slabs; building slabs-on-grade.

B. This Section does not include utility trench backfill, curb & gutters, sidewalks, walkways, driveways, roadways, parking lots, curbs & gutters, and other flatwork or pavement. See Divisions 31 and 32.

1.2 QUALITY ASSURANCE:

A. Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94 requirements for production facilities and equipment.

C. Special Inspection: Inspection and testing of the building subgrade and of the concrete construction shall be performed in accordance with CBC Title 24 Chapter 17A and as delineated in the Statement of Special Inspections.

D. Comply with the references listed below; when an edition (year) is not listed, comply with the most current edition.

1.3 REFERENCES:

A. ACI 301: *Specification for Structural Concrete*

B. ACI 302.1R: *Guide for Concrete Floor and Slab Construction*

C. ACI 117: *Specifications for Tolerances for Concrete Construction and Materials*

D. ACI 318: *Building Code Requirements for Structural Concrete*, 2019 Edition.

E. ACI *Field Reference Manual*, Publication SP-15 (05).

F. Portland Cement Association (PCA): cement and concrete standards.

G. Concrete Reinforcing Steel Institute (CRSI): *Manual of Standard Practice*

H. 2022 *California Building Code* (CBC) Title 24, with amendments for DSA/SS.

I. Applicable or referenced materials and testing standards by the American Society of Testing Materials (ASTM).

J. *Supplemental Geotechnical Engineering Recommendations* for Chualar Elementary School Turf Replacement & Restroom Building Project for 24285 Lincoln Street, Chualar, California by Ajay Singh, G.E. of Earth Systems Pacific, dated April 1, 2025 Project File No. 306771-001. (This document may be referred to as the "Geotechnical Report" or "Soils Report" for the project.)

K. *Geotechnical Engineering Report Update and Soil Infiltration Rate Testing* for Chualar Elementary School Turf Replacement, 24285 Lincoln Street, Chualar, Monterey County, California, by Earth Systems Pacific, dated August 23, 2024.

L. *Geotechnical Engineering Report* for Chualar Elementary School Turf Replacement, 24285 Lincoln Street, Chualar, Monterey County, California, by Earth Systems Pacific, dated September 22, 2015)

1.4 SUBMITTALS:

A. Comply with the requirements of Division 1.

B. Product Data: For each type of product indicated.

C. Design Mixtures: For each concrete mixture.

D. Shop Drawings: For steel reinforcement. Material certificates.

E. Proposed Finishes: Submit to Architect and Owner for approval.

PART 2 – PRODUCTS

2.1 FORM-FACING MATERIALS:

A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.

B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

2.2 STEEL REINFORCEMENT:

A. Reinforcing Bars that will not be welded: ASTM A615, deformed, clean, free of rust, and as follows:
1. #3 bars and smaller: Grade 40 or 60
2. #4 bars and larger: Grade 60

B. Reinforcing Bars that are to be welded: ASTM A706, deformed, clean, free of rust, and as follows:
1. #3 bars and smaller: Grade 40 or 60
2. #4 bars and larger: Grade 60

C. Epoxy-Coated Reinforcing Bars: Shall also conform to ASTM A775.

D. Plain-Steel Welded Wire Reinforcement: ASTM A185, plain, fabricated from as-drawn steel wire into flat sheets.

E. Deformed-Steel Welded Wire Reinforcement: ASTM A497, flat sheet.

F. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice."

G. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice.

2.3 CONCRETE MATERIALS:

A. Cementitious Material:
1. Portland Cement, ASTM C150, Type II, low-alkali
2. Fly Ash: ASTM C618, Class F: 15% max. by weight may be substituted for Portland cement, if mix design is proportioned per ACI 318 Section 5.3.
3. ASTM C595 Type IL (MS) cement with pre-approval.

B. Aggregates:
1. ASTM C33, graded, normal weight. Course aggregate shall be crushed rock.
2. Normal-weight, except where lightweight concrete is specified.
3. 1 inch max. nominal size
4. Largest aggregate size shall be reduced depending upon location and use of the concrete, so that aggregate does not exceed any of the following:
   a. 1/5 the narrowest dimension between sides of forms
   b. 1/3 the least depth (thickness) of slab
   c. 3/4 the minimum clear spacing between individual reinforcing steel, ducts and/or conduits.
   d. 3/4 the clear space between reinforcement and forms
5. Conform to CBC Title 24 Chapter 19A.

C. Water: ASTM C94, and clean and free from deleterious amounts of acids, salts, alkali, and organic materials.

D. Air-Entraining Admixture: ASTM C260

Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride. Admixtures, when used, shall conform to:
1. Water-Reducing Admixture: ASTM C494, Type A.
2. Retarding Admixture: ASTM C494, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C494/, Type D.
4. Plasticizing and Retarding Admixture: ASTM C1017/, Type II
5. Air-Entraining Admixture: ASTM C260.

E. Shrinkage-Reducing Admixture: Shall be used for Slabs.
1. "Eclipse Floor" by Grace Construction Products,
2. "Tetraguard AS20" by BASF Admixtures,
3. or Approved Equal.

2.4 VAPOR RETARDERS:

A. Plastic Vapor Retarder: ASTM E1745, Class A, "VaporBlock VB 15" by Raven Industries, "Moistop Ultra 15", by Fortifiber Corporation, or approved equal. Provide all necessary accessories including adhesive, seam tape, and pipe boots, as approved by plastic vapor retarder manufacturer for the conditions of use.

2.5 CURING MATERIALS:

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

B. Absorptive Cover: AASHTO M182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz/sq.yd. when dry.

C. Moisture-Retaining Cover: ASTM C171, polyethylene film or white burlap-polyethylene sheet.

D. Water: Potable.

2.6 RELATED MATERIALS:

A. Anchor Bolts and Anchor Rods: Heavy Hex-Headed ASTM A36, A307, or F1554 Grade 36, unless noted otherwise.

B. Threaded Rods: Carbon steel conforming to ASTM A307 Grade C or ASTM A193 Grade B7; or stainless steel conforming to ASTM F593 Alloy Group 1 Type 304 Condition CW.

C. Bolts or rods exposed to weather, soil, or moisture shall be hot dip galvanized per ASTM A153 or shall be stainless steel.

D. Mechanical Bar Splice Couplers:
1. Bar-Lock L-series couplers, or approved equal.
2. With lockshear bolts and internal serrated grip rails within the coupling sleeve.
3. Couplers shall exceed the specification requirements for both tension and compression specified by ACI 318 and CBC Title 24 and shall be recognized and approved by ICC.

E. Expansion- and Isolation-Joint-Filler Strips: ASTM D1751, asphalt-saturated cellulosic fiber or ASTM D1752, cork or self-expanding cork.

F. Contraction Joint Filler: Two-component semi-rigid epoxy resin / polymer, 100% solids, minimum "Shore A" hardness of 80 when measured in accordance with ASTM D2240.

G. Epoxy/Adhesive Anchors: Install only where specifically detailed. Type shall be approved for cracked concrete per 2022 CBC and DSA.

H. Expansion Anchors: Install only where specifically detailed. Type shall be approved for cracked concrete per 2022 CBC and DSA.

2.7 CONCRETE MIXTURES:

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301 and 318, and normal weight.

B. Proportion normal-weight concrete mixture as follows:
1. Compressive Strength, Minimum: 4000 psi at 28 day
2. Water-Cement (W/C) Materials Ratio, Max.: 0.45
3. Slump: 4 inches +/- 1 inch
4. Air Content, Max.: 3 percent

C. Shrinkage-Reducing Admixture (SRA): Include in Slab Mixtures so as to limit total concrete shrinkage to a maximum of 0.040% at 28 days. (In order to assist in drying shrinkage reduction, the W/C ratio may be lowered and a water-reducer added.) The addition rate shall be within the manufacturer's "typical" or "recommended" range at a minimum, regardless of the design shrinkage percentage. Note that if separate footing and slab concrete mixes are supplied, the footing mix need not contain SRA.

D. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C94, and furnish batch ticket information. When air temperature is between 85° and 90°F, reduce mixing and delivery time from 90 minutes to 75 minutes; when air temperature is above 90°F, reduce mixing and delivery time to 60 minutes.

E. Drypack/Grout: Non-shrink grout by Five Star Products Inc., Quikrete, or approved equal, for the intended use, installed at a "plastic" consistency, in accordance with approved methods and techniques and per the manufacturer's requirements.

2.8 MISCELLANEOUS STEEL

A. Where steel plates, sections, fabricated connectors or other miscellaneous steel elements are shown in the drawings or otherwise required in the project (but a separate Section 051200 is not included), then provide as follows:
1. Conform to requirements of ASTM and fabricate according to AISC and AWS standards.
2. Special inspection of welding is required.
3. ASTM A36 minimum grade or Type 304 Stainless Steel, unless noted otherwise per plan.
4. Steel that is exposed to weather, moisture, or soil must be hot dip galvanized, stainless steel, or protected from corrosion per the Architect.
5. Provide vent holes in end plates of hollow sections of fabrications that are to be hot dip galvanized.
6. Bolt holes shall be AISC "standard holes." Do not oversize or slot.
7. Finishes are per the Owner and Architect.

PART 3 – EXECUTION

3.1 SUBGRADE PREPARATION:

A. Grading, excavations, compaction and other subgrade preparation shall be under the supervision of a Geotechnical Engineer and in accordance with the referenced soils reports.

3.2 FORMWORK:

A. Design, erect, shore, brace, and maintain formwork according to ACI 301 to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

C. Chamfer exterior corners and edges of permanently exposed concrete when required by the Owner or Architect.

D. Provide air relief holes as necessary.

E. Removal of Formwork: Comply with ACI 301 and ACI 318.

3.3 EMBEDDED ITEMS:

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

B. Embedded items shall be secured in place prior to foundation inspection and prior to pouring concrete.

C. Epoxy/Adhesive: Use only where specifically detailed by the Engineer or Architect. Install per the manufacturer's ICC Evaluation Report. Special Inspection is required.

D. Expansion Anchors: Use only where specifically detailed by the Engineer or Architect. Install per the manufacturer's ICC Evaluation Report. Special Inspection is required.

E. Sill Plate Anchorage:
1. Refer to the construction documents for detailed requirements. Conform with this Section at a minimum.
2. Lumber bearing on concrete or masonry shall be pressure preservative treated wood.
3. Shearwalls:
   a. Sill plates shall be 3x thickness, except where 2x thickness is explicitly allowed.
   b. Secure sill plates with ⅝" dia. headed anchor bolts (AB) with 7" minimum embedment into concrete. Bolts shall not be less than 12" long, however increase length as required for specified embedment, extension through curb and leveling grout (where occurs), and for extension above sill plate for fully securing with washer(s) and nut. Do not use bent-bar ("J" or "L") anchor bolts.
   c. 3"x3"x0.229" plate washers (e.g. Simpson BP5/8-3 or BPS5/8-3). The hole in the plate washer may be diagonally slotted, provided that a standard cut washer is placed between the plate washer and nut. The plate washer shall extend to within ½" of edge of the sill plate on the sheathed side.
   d. Refer to the foundation plan for minimum quantity of AB per shearwall. Refer to the Shearwall Schedule for maximum anchor bolt spacing. Spacing shall not exceed 4 ft. on-center. Bolts shall be placed a maximum of 9" from wall corners, wall ends, and sill plate splices, but not less than 4½", and a minimum of two bolts per piece of sill plate are required. Holdown anchors shall not be counted as any of the required sill plate AB.
   e. Use AB holders and stabilizers per the manufacturer's recommendations, or approved equivalent.
   f. AB's into Existing Concrete: Refer to the structural plans and details.
4. Non-Shearwalls:
   a. Secure sill plates with ⅝" dia. headed anchor bolts (AB) with 7" minimum embedment into concrete. Bolts shall not be less than 12" long, however increase length as required for specified embedment, extension through curb and leveling grout (where occurs), and for extension above sill plate for fully securing with washer and nut. Do not use bent-bar ("J" or "L") anchor bolts.
   b. 3"x3"x0.229" plate washers (e.g. Simpson BP5/8-3) at all AB.
   c. Bolts shall be placed a maximum of 12" from wall corners, wall ends, and sill plate splices, but not less than 4½", and a minimum of two bolts per piece of sill plate are required. Spacing of AB shall not exceed 4 ft. on-center for exterior walls and 6 ft. on-center for interior walls.
   d. Use AB holders and stabilizers per the manufacturer's recommendations, or approved equivalent.
   e. AB's into Existing Concrete: Refer to the structural plans and details.

F. Holdowns: See the drawings for holdown locations and additional notes.

3.4 VAPOR RETARDERS:

A. Plastic Vapor Retarders: Place, protect, and repair vapor retarders according to ASTM E1643, the referenced Geotechnical Report, and manufacturer's written instructions. Lap joints 6" and seal with manufacturer's recommended tape, provide pipe boots at all required locations. Refer to the referenced Soils Report and the drawings for additional requirements.

3.5 STEEL REINFORCEMENT:

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

B. Mechanical Bar Splice Couplers:
1. May be used in lieu of lap splices.
2. Use where indicated on the drawings.
3. Stagger adjacent splices 2 feet minimum.
4. Install per the ICC evaluation report.

C. Lap splices: Stagger 2 feet and with minimum bar lap lengths per the Structural Drawings.

D. Hooks: Refer to Structural Drawings.

E. Dowels: Shall be provided for vertical and horizontal reinforcing bars in walls, columns, curbs, slabs etc., and shall be of the same size and spacing as the supporting or adjacent footing, slab, wall, column, etc. unless noted otherwise on the drawings.

F. Reinforcing Clearances (Cover) for Footings:
1. 3 inches when poured against earth
2. 2 inches when poured against formed surfaces, existing concrete, or top of concrete, except where dimensioned otherwise in the drawings.
3. Where required clearance cannot be achieved, reinforcing shall be epoxy or zinc painted or sprayed. Clearance reduction requires specific approval from the Structural Engineer.

3.6 JOINTS:

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints:
1. Install so strength and appearance of concrete are not impaired, at locations indicated and as approved by Architect.
2. Construction joints shall be roughened to an amplitude of approximately ¼" per ACI 318 section 11.7.9.
3. Wire brush, clean and dampen immediately prior to pouring.
4. Location of foundation construction joints shall be approved by the Engineer.

C. Contraction Joints (or "control joints") in Slabs: Form weakened-plane contraction joints, sectioning concrete into approximately square areas, not to exceed a 1.5:1 length to width ratio. Conform to ACI and PCA recommendations. Construct contraction joints as follows:
1. Grooved (Tooled) Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
3. Owner or Architect's specifications or requirements for contraction joints shall take precedence over these specifications.

D. Isolation Joints in Slabs: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, as indicated.

3.7 CONCRETE PLACEMENT:

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

B. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.

C. Floor Slabs: Comply with ACI 302.1R. When concrete is placed directly on top of the vapor retarder, the concrete contractor shall make the necessary changes in the concrete placement.

D. Cold-Weather Placement: Comply with ACI 306.1.

E. Hot-Weather Placement: Comply with ACI 301.

3.8 FINISHING FORMED SURFACES:

A. Concrete that may remain exposed to public view shall be "Smooth-Formed Finished Concrete." Concrete that will not be exposed to public view shall be "Rough-Formed Finished Concrete" or "Smooth-Formed Finished Concrete."

B. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

C. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes, voids, and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

E. Owner or Architect's specifications or requirements for finishing formed surfaces shall take precedence over these specifications.

3.9 FINISHING FLOORS AND SLABS:

A. Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces.

B. Per the Owner or Architect's specifications or requirements.

3.10 CONCRETE PROTECTING AND CURING:

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing. Concrete shall be maintained above 50°F and in a moist condition for at least the first seven days after placement. When concrete is placed directly on top of the vapor retarder, the concrete contractor shall make the necessary changes in the concrete curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
1. Moisture Curing: Keep surfaces continuously moist for not less than seven days.
2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period. After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound will not interfere with bonding of floor covering used on Project.
4. Curing and Sealing Compound: For interior concrete slabs that may be permanently exposed to public view or where required by the Owner or Architect, apply uniformly to floors and slabs in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.11 FIELD QUALITY CONTROL:

A. The Contractor shall suitably protect the work in order to maintain finishes in perfect condition until final completion and acceptance.

B. Repair and patch defective areas where required by the Owner, Architect, Engineer, or DSA. Remove and replace concrete that cannot be repaired and patched to Owner, Architect, Engineer, or DSA's approval. Any repair or replacement shall be at no additional cost to the Owner.

C. Testing and Inspecting: Contractor shall engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

D. Testing Services:
1. Tests shall be performed according to ACI 301 and CBC Chapter 17A for concrete construction, except where specifically excluded.
2. Batch plant continuous inspection is required per CBC Chapter 17A, except when waived.

E. Special Inspections: Refer to the Statement of Special Inspections for special inspections of work specified in the structural drawings.

F. The Geotechnical Engineer shall provide the Owner and DSA with a report that the building pad was prepared in accordance with the soils report and that the foundation excavations, the soil properties and bearing capacity conform to the Geotechnical Report and the design parameters indicated on the structural drawings.

G. The Geotechnical Engineer shall inspect, test, and sign-off all grading and excavations prior to placement of forms, reinforcing steel or concrete.

END OF SECTION 033000

DSA:

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 01-122444 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 02/11/2026

Structural Engineer:

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Project Name:

CHUALAR UNION E.S. NEW RESTROOM BUILDING

24285 Lincoln St.
Chualar, CA 93925

Drawing Notes:

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DO NOT SCALE THESE DRAWINGS. See the Architectural plans for dimensions. The Contractor shall verify and be responsible for all dimensions and existing conditions on the job and shall report any discrepancies to the Structural Engineer and the Architect for resolution prior to commencing with the work in question.

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Project Engineer: MAM
Checked By: NBW
Scale: -
Job No: 240434

Sheet Title:

STRUCTURAL SPECIFICATIONS

Sheet No.:

S0.2

SECTION 061000 – ROUGH CARPENTRY

PART 1 – GENERAL

1.1 SUMMARY:

A. Work Includes: The complete furnishing and installation of the following:
1. Structural wood framing with dimension lumber and timbers
2. Framing with engineered wood products
3. Framing with glued-laminated timbers
4. Rooftop equipment bases and support curbs.
5. Wood blocking, cants and nailers.
6. Wood furring
7. Wood sleepers
8. Structural sheathing

1.2 QUALITY ASSURANCE:

A. Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Special Inspection: Inspection and testing shall be performed in accordance with CBC Chapter 17A and as delineated in the Statement of Special Inspections.

C. Comply with the references listed below; when an edition (year) is not listed, comply with the most current edition.

1.3 REFERENCES:

A. NDS-18: National Design Specification (NDS) for Wood Construction with 2018 Supplement, by the American Forest & Paper Association (AF&PA).

B. SDPWS-21: Special Design Provisions for Wind and Seismic, by the AF&PA.

C. PS 1: Structural Plywood, by the U.S. Department of Commerce (DOC)

D. PS 2: Performance Standard for Wood-based Structural-use Panels, by the DOC.

E. PS 20: American Softwood Lumber Standard, by the DOC.

F. 2022 *California Building Code* (CBC) Title 24, with amendments for DSA/SS..

G. Applicable or referenced materials and testing standards by the American Society of Testing Materials (ASTM).

1.4 SUBMITTALS:

A. Comply with the requirements of Division 1.

B. Product Data: For each type of process, factory-fabricated product, anchors, connectors, and fasteners.

C. Research/Evaluation Reports – for the following, showing compliance with building code in effect for Project:
1. Engineered wood products.
2. Power-driven fasteners.
3. Powder-actuated fasteners.
4. Expansion anchors.
5. Metal framing anchors and connectors.
6. Other hardware

D. Data for wood-preservative and fire-retardant treatment (when applicable) from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements.

E. AITC Certificate of Compliance for glued-laminated timbers

F. Sheathing type and grade for each application.

G. Lumber grade and species for each application.

H. Manufacturer's installation requirements and recommendations, and maintenance instructions.

PART 2 – PRODUCTS

2.1 WOOD PRODUCTS, GENERAL:

A. Lumber: Per DOC PS 20 or equivalent and applicable rules of grading agencies indicated.
1. WCLIB or WWPA grading agency, approved by the ALSC Board of Review.
2. Factory mark each piece of lumber with grade stamp of grading agency.
3. Provide dressed lumber, S4S, unless otherwise indicated.
4. Douglas Fir-Larch (DF), unless specifically noted otherwise. (Hem-Firm, Douglas Fir-Larch-North, Douglas Fir-South, and Pines are not allowed under this Section.)

B. Engineered Wood Products:
1. Provide engineered wood products acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project. Refer to related Sections.
2. Allowable Design Stresses: Provide engineered wood products with allowable design stresses, as published by manufacturer, which meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

2.2 PRESERVATIVE-TREATED WOOD:

A. Preservative Treatment by Pressure Process, shall conform to AWPA Standards. Additionally:
1. ACQ-treated wood or approved equal shall be used, except where borate-treated wood is allowed.
2. Borate-treated wood may be used for interior dry conditions (such as a sill plate or ledger that will be covered and weatherproofed). Borate-treated wood may not be used where it may come into contact with soil, moisture or liquid water. ACQ-treated wood must be used when in contact with concrete stemwalls, footings, gradebeams, foundations, or slabs that are in contact with soil, and shall be used for sill plates in walls around and within restrooms and utility/janitor closets.
3. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.

B. Kiln-dry lumber after treatment to a maximum moisture content of 14%.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

D. Application: Treat items indicated on the construction documents, and the following:
1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
2. Wood sills, sleepers, blocking, furring, and similar concealed members in contact with masonry or concrete.
3. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.
4. Wood framing 4x and smaller members that are less than 18 inches above the ground in crawlspaces or unexcavated areas.
5. Wood framing 6x and larger members supporting wood joists (i.e. girders) that are less than 12 inches above the ground in crawlspaces or unexcavated areas.
6. Wood floor plates that are installed over concrete slabs-on-grade.

2.3 FIRE-RETARDANT-TREATED WOOD:

A. General: Use where indicated in the construction documents.
1. Comply with performance requirements in AWPA C20 (lumber) and AWPA C27 (plywood).
2. Use Exterior type for exterior locations and where indicated.
3. Use Interior Type A, High Temperature (HT) for enclosed roof framing, framing in attic spaces, and where indicated.
4. Use Interior Type A, unless otherwise indicated.

B. Identify fire-retardant-treated wood with appropriate classification marking of testing and inspecting agency acceptable to authorities having jurisdiction.

2.4 DIMENSION LUMBER FRAMING:

A. Moisture Content: 19% maximum, except where kiln-dried or other moisture content is indicated.

B. Grades shall be as indicated on the construction documents, with minimum as follows or better:
1. 1x, 2x, and 3x: No. 2
2. 4x and larger: No. 1

C. Exposed Framing (Indicated to Receive a Stained or Natural Finish): Provide material hand-selected for uniformity of appearance and freedom from characteristics, on exposed surfaces and edges, that would impair finish appearance, including decay, honeycomb, knot-holes, shake, splits, torn grain, and wane. Use Species and Grade as indicated above for structural framing of same type. Use better and/or architectural grade when required by the Owner or Architect.

2.5 WOOD STRUCTURAL PANELS (or "SHEATHING"):

A. Shall conform to the requirements for their type in DOC PS 1 or PS 2.

B. Each panel shall be identified for grade and glue type by the trademarks of an approved testing and grading agency.

C. Minimum thicknesses are per the drawings.

D. Panel Index (PI) or "Roof/Floor span rating" is per the drawings, however it shall not be less than the following:
1. 48/24 for floor sheathing.
2. 24/16 for roof sheathing.

E. Where sheathing may be subjected to repeated wetting and redrying or long-term exposure to weather or similar conditions:
1. "Exterior Plywood" – Grade C-C or Structural 1 C-C with exterior glue

F. Where sheathing will not be subjected to repeated wetting and redrying or long-term exposure to weather or similar conditions:
1. Plywood – Grade C-D with exterior glue (or "CDX"), Exposure 1.
2. Composite Panel, Oriented Strand Board (OSB), or other Mat-Formed Structural-Use Panel – Grade Structural 1, Exposure 1.

G. Where "Structural 1" (or "Struct 1" or "ST1") is required per the plans, use Grade Structural 1 sheathing per PS 1 or PS 2.

2.6 ENGINEERED WOOD PRODUCTS:

A. Laminated-Veneer Lumber (LVL): Structural composite lumber made from wood veneers with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D5456 and manufactured with an exterior-type adhesive complying with ASTM D2559 and containing no urea formaldehyde.
1. Manufactured by:
a. Weyerhaeuser
b. Roseburg Forest Products.
c. Standard Structures, Inc.
d. Approved equal.
2. Properties:
a. Extreme Fiber Stress in Bending, Edgewise: 2600 psi for 12-inch nominal-depth members.
b. Modulus of Elasticity, Edgewise: 1,900,000 psi
c. Specific Gravity: 0.50
d. Thickness: 1¾" inches minimum.
3. Parallam PSL by Weyerhaeuser or Approved Equal may be used in lieu LVL.

B. I-Joists: "TJI" I-Joists have been used as the basis of design, and have therefore been indicated on the drawings. Joists by other manufacturers with equal or greater design properties and with ICC and DSA approval shall be considered as alternatives, subject to verification and approval by the Owner and DSA. "TJI" I-Joists are manufactured by Weyerhaeuser, ICC Evaluation Service Report ESR-1153 for *TJI Prefabricated Wood I-Joists.*

2.7 GLUED-LAMINATED TIMBER (or "GLULAM" or "GLB"):

A. Grade:
1. Simple Span Beams: 24F-1.8E (24F-V4)
2. Cantilevered Beams: 24F-1.8E Balanced-Layup (24F-V8)
3. Columns and Truss Members: L2 or 24F-V8

B. Species: Douglas-Fir (DF)

C. Members, or portions thereof, that are exposed to weather and not fully protected from moisture by roof, eave or similar covering shall be preservative-treated or be manufactured from naturally-durable wood. Exterior members shall be considered for "wet service" and interior protected members shall be considered for "dry service" conditions.

D. When preservative treatment is required, the manufacturer shall submit the proposed preservative material and retention quantity for review and approval prior to manufacture.

E. If a species other than DF is used, such as Alaska Cedar (AC) for weather exposure requirements, then contact the Engineer for conformance with stress and deflection requirements.

F. Beams shall have factory standard camber, except where noted otherwise on the plans. Camber radius shall be 3,500 feet or less, unless noted otherwise. (Note that camber increases as the radius decreases.) Cantilevered portions of beams shall not be cambered.

G. Members shall be manufactured and identified as required in ANSI/AITC A190.1 and ASTM D3737. Members shall be protected during shipping and field handling in accordance with AITC 111.

H. Special inspection of manufacturing is required per CBC Title 24 Section 1705A.5.5, unless the members meet the exception therein.

2.8 MISCELLANEOUS LUMBER:

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
1. Blocking.
2. Nailers.
3. Cants.
4. Furring
5. Rooftop equipment bases and support curbs, unless prefabricated metal units are installed that do not require wood base or curbs (except for blocking between framing).

B. For items of dimension lumber size, provide Stud or No. 2 or better grade lumber with 19% maximum moisture content; Douglas Fir-Larch; WCLIB or WWPA.

2.9 FASTENERS:

A. General:
1. Provide fasteners of size and type indicated that comply with requirements specified.
2. Where fasteners are exposed to weather, soil, moisture, preservative-treated wood, fire-retardant-treated wood, or in an area of high relative humidity, they shall be of hot-dipped zinc-coated galvanized steel or stainless steel.
3. Number and size of fasteners connecting wood members shall not be less than that set forth in 2022 CBC Title 24 Table 2304.10.2 Fastening Schedule.

B. Nails:

1. ASTM F1667
2. "Common" refers to common steel wire nails or spikes. "Sinker" refers to steel sinker nails. "Box" refers to steel box nails.
3. Lengths of nails shall be sufficient to provide at least 10 diameters embedment into the main member, except that when attaching sheathing, minimum embedment into main member shall be 1½" for 10d nails or 1⅜" for 8d nails.
4. Conform with the following diameters (per NDS), unless noted otherwise:
a. 20d Common: 0.192"
b. 20d Sinker: 0.177"
c. 20d Box: 0.148"
d. 16d Common: 0.162"
e. 16d Sinker: 0.148"
f. 16d Box: 0.135"
g. 10d Common: 0.148"
h. 10d Sinker: 0.120"
i. 10d Box: 0.128"
j. 8d Common: 0.131"
k. 8d Sinker: 0.113"
l. 8d Box: 0.113"

C. Power-Driven Fasteners: NES NER-272.

D. Bolts: Steel bolts complying with ASTM A307, with ASTM A563 hex nuts and flat washers, unless noted otherwise. Plate washers conforming to ASTM A36 are required where indicated on the drawings.

E. Threaded Rods: Carbon steel conforming to ASTM A307 Grade C or ASTM A193 Grade B7; or stainless steel conforming to ASTM F593 Alloy Group 1 Type 304 Condition CW.

F. Powder-Actuated Fasteners (or "Shotpins"):
1. Preservative-treated or fire-retardant-treated Wood: PDPWL-300MG by Simpson Strong-Tie, or Approved Equal.
2. Untreated Wood: PDPWL-300 by Simpson Strong-Tie, or Approved Equal.
3. Per ICC-ES ESR-2138, or Approved Equal's ICC-ES Report.
4. 0.145 in. dia. x 3 in. long headed fastener with 1 in. dia. washers.

2.10 METAL FRAMING ANCHORS:

A. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include: Simpson Strong-Tie Co., KC Metals Products, Inc., or Approved Equal.

B. Design: Simpson Strong-Tie Co. products were used as the basis of design. Product callouts on construction documents refer to Simpson Strong-Tie model number. Provide products with allowable design loads, as published by manufacturer and ICC evaluation report, which meet or exceed those by Simpson Strong-Tie Co. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

C. Galvanized Steel Sheet: Zinc-coated complying with ASTM A653, minimum G60 coating.

D. Connectors exposed to weather, soil, or in contact with ACQ treated wood shall have minimum G185 zinc coating, be hot-dip galvanized, or be stainless steel.

2.11 MISCELLANEOUS STEEL:

A. Where steel plates, sections, fabricated connectors or other miscellaneous steel elements or fabrications are shown in the drawings or otherwise required in the project (but a separate Section 051200 is not included), provide as follows:
1. Conform to requirements of ASTM and fabricate according to AISC and AWS standards.
2. Special inspection of welding and material verification are required.
3. ASTM A36, A572 Grade 50, or Type 304 Stainless Steel, unless noted otherwise in the plans.
4. Hollow Structural Sections (HSS): ASTM A500 Grade B (Fy = 46 ksi).
5. Sections, plates, and bars shall not be sheared – they shall be gas-cut or saw-cut.
6. Steel exposed to weather, moisture, or soil must be hot dip galvanized or stainless steel.
7. Provide vent holes in end plates of hollow sections or fabrications that are to be hot dip galvanized.
8. Bolt holes shall be AISC "standard holes." Do not oversize or slot.
9. Finishes are per the Architect.

PART 3 – EXECUTION

3.1.1 INSTALLATION:

A. General Requirements:
1. Fabricate, size, install, connect, fasten, bore, notch, and cut wood and sheathing with joints true, tight, and well-nailed, screwed or bolted as required; members to have solid bearing without being shimmed, unless noted otherwise. Set horizontal members subject to bending with the crown up. Install framing plumb, square, true and cut for full bearing. Splices are not permitted between bearings. Use full lengths unless otherwise specified.
2. Notching, drilling, splicing, or cutting of any structural member is not permitted without prior approval. Reinforce or replace wood framing members damaged by erroneous cutting as directed by the Engineer. Whenever necessary to avoid splitting, sub-drill (pre-drill) for nails and screws with the diameter of the hole smaller than that of nails or screws.
3. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Perform cutting for other trades under the direction of trade involved. Locate furring, nailers, blocking, ledgers, and similar supports to comply with requirements for attaching other construction.
4. Do not splice structural members between supports, unless otherwise indicated.
5. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated on the construction documents.
6. Comply with 2022 CBC Title 24 details for conventional light frame construction, except where indicated.

B. Sheathing:
1. Nail as specified on the plans with perimeter nails not closer than ½" from the edges. Do not overdrive nails through the face grain.
2. Install with the face grain across supports, end supports staggered and the edges of sheets centered over supports. Provide minimum 2x thick blocking of the same depth as the joists or 3x4 flat blocking under all plywood edges, except that full-depth blocking is required under walls.
3. Where new sheathing is installed over existing 1x sheathing, sheets need to be staggered; attach new sheathing with full length common nails through the 1x sheathing into the solid framing and blocking underneath all edges and at field nailing.
4. Provide cant strips and saddles where shown or necessary to pitch water to drain.
5. Sheathing installation shall conform to APA recommendations.
6. Use of machine nailing is subject to a satisfactory jobsite demonstration and the approval of the Owner's Representative, Architect, or Engineer. The approval is subject to continued satisfactory performance. Machine nailing is not allowed for 5/16" or thinner sheathing. If the nail heads penetrate the outer ply by more than would be normal for a hand-held hammer, or if minimum allowed edge distances are not maintained, the performance will be deemed unsatisfactory and machine nailing shall be discontinued.

C. Fasteners:
1. Lag Screws: Install with the base of the head flush with the surface of the connected member. Bore lead holes approximately ¾ of diameter and same depth as shank (except when not required by the manufacturer, such as for Simpson SDS Screws). Provide a standard washer under the head of the lag when bearing upon wood. Install by using a wrench, not by driving with a hammer. Soap or other lubricant shall be used on the lag screws or in the lead holes to facilitate insertion and prevent damage to the lag screws. Locate lag screws on centerline of member (e.g. block, rim, joist) unless shown otherwise.
2. Bolts: Drill bolt holes 1/32" to 1/16" larger than bolt diameter such that bolts fit tight. Provide standard washers under the heads and nuts when bearing upon wood. Holdown bolts shall be torqued tight just prior to covering the wall. The inspector shall verify that bolts are installed tight.
3. Powder-Actuated Fasteners (or "Shotpins"):
a. May be used for attachment of miscellaneous furring, framing, and interior non-bearing stud wall sill plates to concrete or masonry.
b. Sill plates shall have fasteners placed at 6" from ends and at a spacing of 16" o.c. or less.
c. Install per the fastener's ICC-ES Report and with minimum 1¼" embedment, unless noted otherwise.
4. Nails shall not be driven closer together than ½ their length nor closer to the edge or end of lumber than ¼ their length (except for sheathing). The penetration of nails or spikes into pieces receiving the point shall not be less than ½ the nail length, except that 16d may be used to connect pieces of 2x. Use "common" nails unless noted otherwise.
5. Comply with the 2022 CBC Title 24 Table 2304.10.2 Fastening Schedule.

D. Sill Plates on Concrete or Masonry:
1. Lumber bearing on concrete or masonry shall be pressure preservative treated wood.
2. Refer to Section 033000 – Cast-In-Place Concrete for additional Sill Plate Anchorage requirements. Shearwall and other wall anchorage to concrete or masonry requires coordination between foundation and framing construction disciplines. Rough carpentry specifications related to framing at the interface of existing or new concrete may be contained only within Section 033000. General contractor shall coordinate all construction disciplines (subs).

E. Wood Stud Walls:
1. Walls, Partitions, and Furring: Use studs of sizes and spacings shown on the drawings, with single plate at bottom (sill plate) and doubled-plate at top (top plates), unless otherwise shown. Stagger joints in double members at top plate by at least four feet. Splice per the detail(s) on the drawings.
2. Blocking: Provide at least one row of minimum 2x thick blocking of same width as stud, fitted snugly and spiked into studs at mid-height of walls over 8'-0" high. Space blocking at a maximum of 8'-0" o.c. Cripple walls (or "pony walls") less than 14" in height shall be solid blocking. Refer to shearwall detailing and notes for additional blocking requirements at shearwalls. Refer to the architectural drawings and specifications for other additional blocking requirements.
3. Notching: In exterior and bearing walls, notches in studs shall not exceed 25% of the stud depth (⅞" for 2x4 and 1⅜" for 2x6). Non-bearing partition walls may be notched not greater than 40% of the stud depth (1⅜" for 2x4 and 2⅛" for 2x6).
4. Drilling Holes: In exterior and bearing walls, holes in studs shall not exceed 40% of stud depth. Non-bearing partition walls may be drilled not greater than 60% of stud depth.
5. Angles and Overhangs: Form corners, and where stud partitions and wood vertical furring meet with blocked triple studs or as detailed. Form openings in wood partitions with double studs at each side, and 4x or 6x headers across top resting on trimmer studs at each end. Headers shall be 4x4 or 6x6 unless otherwise noted on the plans.
6. Bearing: Provide a minimum of 1½" of bearing for headers unless noted otherwise on plans. Members bearing on prefabricated hangers are to have full bearing and nailing per manufacturer's specifications.
7. Top Plates: Where top plates are notched or drilled, strap at least one side with (2) Simpson RPS straps. Length of strap and installation are per the manufacturer's specifications.
8. Sole Plates: At double sole (sill) plates on wood floors, nail second sole plate to first sole plate with 2-10d @ 8" o.c., unless noted otherwise.

F. I-Joists:
1. Installation shall be in accordance with the ICC evaluation report, and per the manufacturer's written specifications and installation guide.
2. Shall not be used in exterior conditions or where exposed to weather or moisture, unless fully protected from moisture per the architect's details and specifications.
3. Do not cut, notch, or drill without specific written approval of the manufacturer.
4. Minimum bearing at end supports is 1¾" and at intermediate supports is 3½", unless noted otherwise. Lateral support of joists at bearing points is required with full depth blocking or rim board, per manufacturer specifications.
5. Provide web stiffeners to I-joists at bearing supports unless specifically noted otherwise.
6. Install full-depth blocking where required by the manufacturer and under all perpendicular walls.
7. Install double-joists under parallel walls.
8. Rim boards shall be minimum 1½" thick members, minimum.

G. Roof and Ceiling Framing:
1. Provide rafters, joists, and purlins as shown on the drawings. Place with crown edge up.
2. Bridging/Blocking: Provide min. 2x thick solid wood blocking, cut in between and the same depth as the joists at a spacing of no greater than 8-ft. on-center. Provide blocking at all plywood panel edges.

H. Posts on upper levels shall be stacked on posts of equal size at levels below, unless a larger post is specified on the plans. Blocking shall be used to fully transfer the post area through floors. This arrangement shall continue until the post is supported by a designed beam or the foundations. Posts inside walls shall bear on sill plates and isolated posts shall be seated in PB or CB or similar metal bases. Posts shall be continuous between top and bottom plates, unless specifically noted otherwise. Headers framing into continuous posts without trimmer studs shall be supported in HUC hangers.

I. LVL Framing:
1. Comply with manufacturer's written instructions and with the approved ICC evaluation report.
2. Beams shall comprise of multiple 1¾" thick members and be connected with 16d common nails, ½" bolts, or ¼" lag screws (e.g. Simpson SDS screws) in accordance with the manufacturer's specifications. If thicker LVL beams are available from the manufacturer (e.g. Roseburg Forest Products), a single solid piece may be used in lieu connecting multiple 1¾" thick pieces.
3. Beam bearing shall be 1½" minimum length and the full width of the beam. Lateral support of beams at bearing points is required. Additionally, lateral support of beam compression edge is required at 24" o.c. if sheathing is not directly attached.
4. Nailing down into the top edge of an LVL beam shall not be spaced any closer than 6" for 16d common, 4" for 10d common, and 3" for 8d common. When nailing must be reduced, stagger rows ½" apart minimum while maintaining minimum required edge distances.

J. Metal Framing Anchors:
1. Install metal framing to comply with manufacturer's written instructions and the applicable ICC evaluation report.
2. Provide the type of nails specified by the manufacturer and fully drive nails into all holes of the connector unless noted otherwise on plans.
3. Where A35 or LTP4 clips are placed directly against the framing, 1½" long nails are acceptable; where these clips are placed over plywood, use full-length common nails through plywood into framing.
4. Use LTP5 connectors in lieu of LTP4 connectors when all nails in the LTP4 cannot be driven into solid wood framing, such as when bridging over roof or floor sheathing.

K. Shearwalls:
1. Shearwall type and nailing are per the drawings. See shearwall schedule on drawings.
2. Shearwalls shall extend horizontally between openings unless noted otherwise and shall extend through attics to the roof diaphragm. Shearwall lengths shown on plans are minimum required.
3. Shear transfer mechanism to framing above and to framing or foundation below are per the drawings.
4. Sheathing shall be nailed with common nails or with hot-dipped (or tumbled) galvanized box nails. Edge nails shall have a minimum ½" edge distance.
5. 3x framing, as noted on the shearwall schedule on the drawings, is required as follows, except where 2x is specifically allowed:
a. Studs and blocking at adjoining panel edges (joints)
b. Sill plates on masonry or concrete.
c. Sill plates at two-sided shearwalls, i.e. sheathing on both sides.
d. Double 2x members spiked with 2-16d at 4" o.c. with boundary nails staggered between alternate 2x members may be used in lieu of a 3x.
6. At 3x framing, stagger edge nails.
7. Nails in preservative-treated wood (including foundation sill plates) shall be of hot-dipped zinc-coated galvanized steel or stainless steel, unless the wood is Borate-treated.
8. Sheathing panels shall be 2 feet wide minimum.

L. Comply with AWPA requirements for applying field treatment to cut surfaces of preservative-treated lumber.

3.1.2 MISCELLANEOUS STEEL:

A. Welding shall be in accordance with all AISC and AWS specifications, performed by certified welders.

B. Testing and Inspecting: Contractor shall engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

C. Exposed welds shall be filled and ground smooth where metal will come in contact with the public, unless reasonably smooth and uniform welds have been provided. Additional finish requirements are per the Owner and Architect.

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Project Name:

CHUALAR UNION E.S. NEW RESTROOM BUILDING

24285 Lincoln St.
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Checked By:	NBW
Scale:	-
Job No:	240434

Sheet Title:

STRUCTURAL SPECIFICATIONS

Sheet No.:

S0.3

D. Bolt holes shall be AISC “standard holes.” Do not oversize or slot.

E. No holes other than those specifically detailed shall be allowed through structural steel members. No cutting or burning of structural steel will be permitted without prior consent of the Engineer.

F. Steel exposed to weather, soil, or moisture shall be galvanized or have similar corrosion protection. Steel embedded in concrete shall have the same cover requirements as for reinforcing steel (rebar), unless the embedded steel is galvanized or has similar corrosion protection. Finishing requirements for exposed steel are per the Architect.

G. Repair defective elements where required by the Owner, Architect, Engineer, or DSA. Remove and replace elements that cannot be repaired to Owner, Architect, Engineer, or DSA’s approval. Any repair or replacement shall be at no additional cost to the Owner.

3.1.3 FIELD QUALITY CONTROL:

A. Special Inspections: Refer to the Structural Title Sheet. Contractor shall engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Correct deficiencies in Work that inspections indicate does not comply with the Contract Documents.

C. Repair defective elements where required by the Owner, Architect, Engineer, or DSA. Remove and replace elements that cannot be repaired to Owner, Architect, Engineer, or DSA's approval. Any repair or replacement shall be at no additional cost to the Owner.

END OF SECTION 061000

SECTION 051200 – STRUCTURAL STEEL

PART 1 - GENERAL

1.01 SUMMARY

A. Work Includes: structural steel, including steel framing, metal (steel) deck, braces, welding, bolting, and miscellaneous connections and fabrications.

1.02 SUBMITTALS

A. Comply with Division 1 specifications and the Architect’s additional instructions.

B. Product Data: For each type of product indicated.

C. Shop Drawings: Show fabrication of structural-steel components.

D. Welding certificates.

E. Mill test reports.

F. Source quality-control test reports.

1.03 QUALITY ASSURANCE

A. Fabricator Qualifications: A qualified fabricator, approved by the building department and the Owner, who has had review and approval by a certified special inspector. Approval shall be based upon review of the fabricator's written procedural and quality control manuals and periodic auditing of fabrication practices by an approved special inspection agency.

B. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code - Steel," supplemented with AWS D1.8, “Structural Welding Code – Seismic Supplement.” Welding shall be performed by approved certified welders.

C. Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

D. Special Inspection: Inspection and testing shall be performed in accordance with CBC Chapter 17 and as delineated in the Statement of Special Inspections.

E. Comply with the references listed below; when an edition (year) is not listed, comply with the most current edition.

1.04 REFERENCES

A. AISC 360 – *Specification for Structural Steel Buildings*

B. AWS D1.1 – *Structural Welding Code – Steel*

C. AWS D1.3 – *Structural Welding Code – Sheet Steel*

D. AWS D1.4 – *Structural Welding Code – Reinforcing Steel*

E. AWS QC1 – *Standard for AWS Certification of Welding Inspectors*

F. 2022 *California Building Code* (CBC) Title 24, with amendments for DSA/SS.

G. Applicable or referenced materials and testing standards by the American Society of Testing Materials (ASTM).

PART 2 - PRODUCTS

2.01 STRUCTURAL-STEEL MATERIALS

A. W-Shapes: ASTM A992 or ASTM A572 Grade 50

B. HSS (Hollow Structural Sections) – including Rectangular, Square, and Round – shall conform to ASTM A500, Grade C.

C. Steel Pipe: ASTM A53 Grade B or ASTM A501.

D. Other Shapes (e.g. Angles, Channels): ASTM A36 or ASTM A572 Grade 50.

E. Plates: ASTM A572 Grade 50

F. Stainless Steel:

1. Plates, sheets, and strips: ASTM A240 and Grade Type 304 (or 316 if welded).
2. Bars and shapes: ASTM A276 and Type 304 (or 316 if welded).

G. Welding Electrodes: Comply with AWS requirements. See “Seismic Welds” below for welds in the SFRS.

H. Steel Reinforcing Bars (rebar): See Section 033000 – Cast-In-Place Concrete.

I. Drypack/Grout: See Section 033000 – Cast-In-Place Concrete.

2.02 BOLTS, CONNECTORS, AND ANCHORS

A. Bolts, Nuts, and Washers:

1. ASTM A325, Type 1, heavy hex steel structural bolts; ASTM A563 heavy hex carbon-steel nuts; and ASTM F436 hardened carbon-steel washers.

B. Anchor Rods (or Anchor Bolts): ASTM F1554 Grade 36, unless noted otherwise.

C. Threaded Rods: Carbon steel conforming to ASTM A307 Grade C or ASTM A193 Grade B7; or stainless steel conforming to ASTM F593 Alloy Group 1 Type 304 Condition CW.

D. Bolts or rods exposed to weather, soil, or moisture shall be hot dip galvanized per ASTM A153 or shall be stainless steel.

2.03 PRIMER

A. Primer: SSPC-Paint 25, Type II, iron oxide, zinc oxide, raw linseed oil, and alkyd.

B. Primer: Fabricator's standard lead- and chromate-free, non-asphaltic, rust-inhibiting primer.

2.04 FABRICATION

A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to referenced standards and specifications.

B. Weld Connections: Comply with AWS D1.1 for welding procedure specifications, tolerances, appearance, and quality of welds and for methods used in correcting welding work, supplemented with AWS D1.8 as required.

C. Exposed structural steel shall conform to AISC 303 Section 10 for architecturally exposed structural steel (AESS).

D. General:

1. Use materials of size and thickness shown. If not shown, use required size and thickness to produce strength and durability in the finished product.
2. Work to dimensions shown on the architectural drawings. Plan and elevation dimensions shown on structural drawings are shown for clarification.
3. Form exposed work true to line and level, with accurate angles and surfaces and with straight shape edges. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
4. Ease exposed edges to a radius of approximately 1/32" unless otherwise shown. Weld corners and seams continuously, complying with AWS recommendations.
5. At exposed connections, grind exposed welds smooth, unless reasonably smooth and uniform welds have been provided. Additional finish requirements are per the Architect.
6. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of type shown or, if not shown, use Phillips flathead (countersunk) screws or bolts.
7. Provide for anchorage of the type shown or required. Coordinate with supporting structure. Fabricate and space the anchoring devices to provide adequate support for intended use.
8. Cut, reinforce, drill, and tap miscellaneous metal work as indicated to receive finish hardware and similar items.
9. Install drain holes in hollow assemblies to be hot dip galvanized, without compromising the required strength of the assembly.
10. Sections, plates and bars shall not be sheared gas-cut or saw-cut.
11. Bolt holes:
    a. Holes in Baseplates: AISC “Standard” or “Oversize” holes.
    b. All Other Holes: AISC “Standard” holes, drilled a maximum of 1/16” larger than the bolt diameter.
12. Welding shall be performed using SMAW, SAW, GMAW, or FCAW processes with approved electrodes conforming to ASTM A-233 and applicable AWS specifications. Welds shall use E70XX electrodes, unless noted otherwise, with a minimum CVN toughness of 20 ft-lb at -20ºF, using AWS A5 classification test methods.
13. Minimum preheat and interpass temperatures shall be provided for all welds, including tack welds, in accordance with AWS D1.1, Table 3.2. The maximum preheat and maximum interpass temperature permitted is 550ºF, measured at a distance of 1 in. from the point of arc initiation.
14. Welding shall be performed by welders certified in accordance with AWS D1.1.
15. Use weld tabs (backing bars) as required. After welding, remove weld tabs and finish to a smooth contour. Backgouge the weld root to sound metal and weld backgouged region.

2.05 SHOP PRIMING

A. Shop prime steel surfaces except the following:

1. Surfaces embedded in concrete or mortar in an interior protected environment. Extend priming of partially embedded members to a depth of 2 inches.
2. Surfaces to be field welded.
3. Surfaces to receive sprayed fire-resistive materials.
4. Galvanized surfaces.

B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to SSPC-SP2, "Hand Tool Cleaning."

C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a dry film thickness of not less than 1.5 mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

D. Materials exposed to weather, soil, or moisture shall be hot dip galvanized (G90 min. coating), shall be stainless steel, or protected per the Owner or Architect’s requirements when specified.

PART 3 - EXECUTION

3.01 ERECTION

A. Examination: Verify elevations of bearing surfaces and locations of anchor rods, bearing plates, and other embedments, with steel erector present, for compliance with requirements. Proceed with installation only after unsatisfactory conditions have been corrected.

B. Set structural steel accurately in locations and to elevations indicated.

C. Maintain erection tolerances of structural steel within AISC’s *Code of Standard Practice for Steel Buildings and Bridges*.

D. No holes other than those specifically detailed shall be allowed through structural steel members. No cutting or burning of structural steel will be permitted without prior consent of the engineer and special inspector.

3.02 FIELD CONNECTIONS

A. Standard Bolts: Install ASTM A307 bolts, unless noted otherwise, per AISC specifications in snug-tight condition.

B. Weld Connections: Comply with AWS standards for welding procedure specifications, tolerances, appearance, and quality of welds and for methods used in correcting welding work. Comply with AISC and AWS standards for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.

3.03 FIELD QUALITY CONTROL

A. The Contractor shall suitably protect the work in order to maintain finishes in perfect condition until final completion and acceptance.

B. Finishes of exposed materials are per the Owner or Architect.

C. Welded Connections: Field welds shall be inspected according to AWS D1.1 and the construction documents.

D. Testing and Inspecting: Contractor shall engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

E. Special Inspections: Refer to the Structural Title Sheet, *Statement of Special Inspections*.

F. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

G. Repair defective elements where required by the Owner, Architect, or Engineer. Remove and replace elements that cannot be repaired to Owner, Architect, or Engineer’s approval. Any repair or replacement shall be at no additional cost to the Owner.

END OF SECTION 051200

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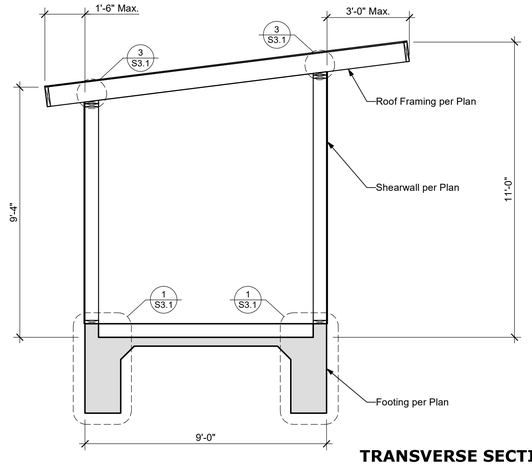
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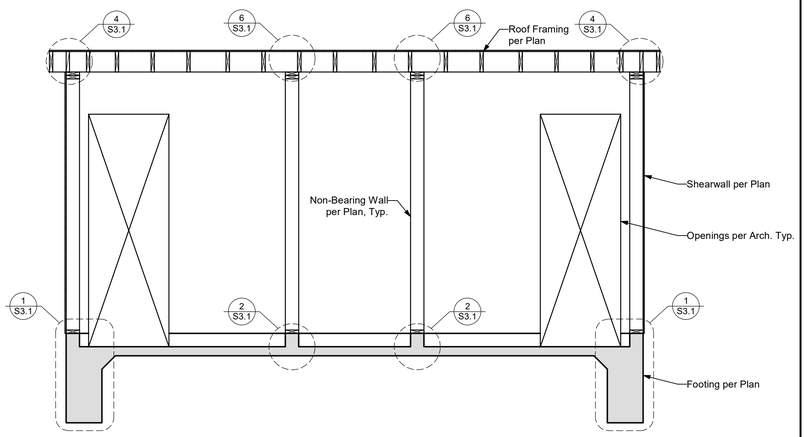
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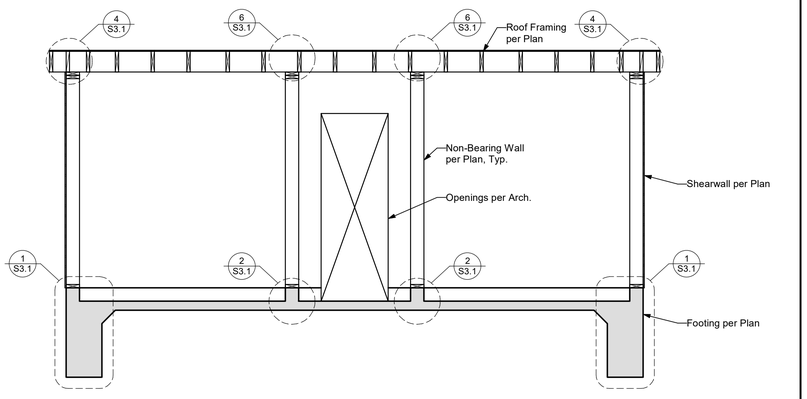
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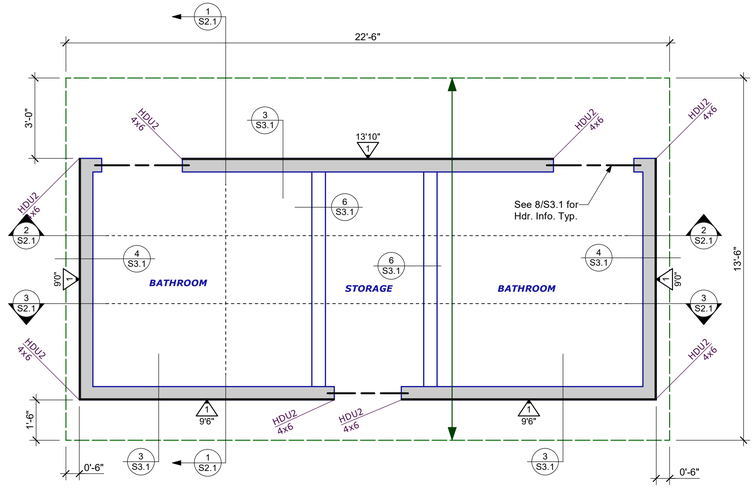
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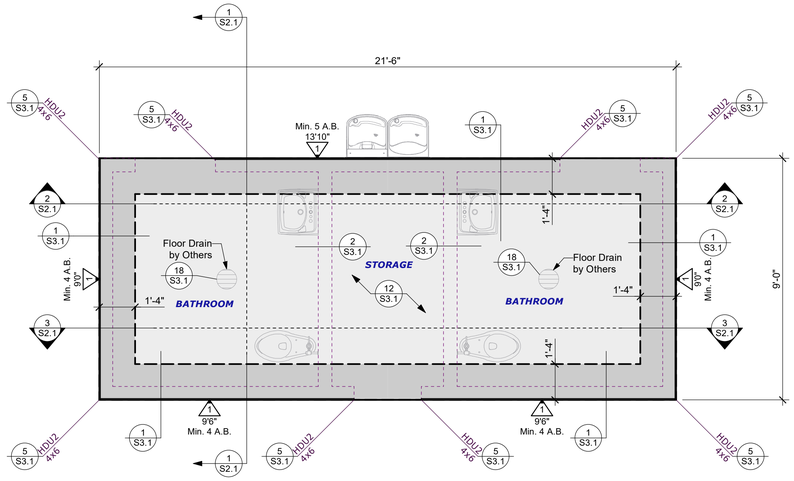
LONGITUDINAL SECTION 2



LONGITUDINAL SECTION 3



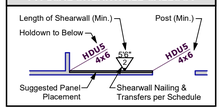
FRAMING PLAN



FOUNDATION PLAN

See Specs, Schedule, Detail 10/S3.1, and Notes for Add'l Requirements

TYPICAL SHEARWALL CALLOUT



ROOF FRAMING & FOUNDATION NOTES

FRAMING CALLOUT KEY:

2x10 RR @ 16" o.c. UNO

6x6 Header UNO, See 8/S3.1

WALL & SYMBOL KEY:

= Structural Wall w/ 2x6 Studs @ 16" o.c. Max.

= Non-Bearing Wall w/ 2x6 Min. Studs @ 16" o.c. (Larger Stud Size Where Specified per Arch.)

= Stud Walls at Level Above

= Extent of Roof Above

= Foundation per Plan

= Slab on Grade per Plan, See Detail 12/S3.1

See General Notes & Specifications for Additional Requirements and Material Specifications

All Dimensions per Architectural Plans, Contractor to Verify Dimensions Prior to Commencement of Construction

Roof Sheathing Shall be 15/32" CDX Plywood, PI 32/16, Nailed w/ 10d Commons at 6" for Panel Edges, 6" for BN, 12" for Field Nailing UNO Reference Detail 7/S3.1
3x4 Flat Solid Blocking Required at All Panel Edges, UNO See Detail 7/S3.1 for Additional Roof Diaphragm Information
Framed Walls Shall Have Continuous Double Top Plates, Splice as Required per Structural Details

Sill Plate Anchor Bolts (AB) Shall be 5/8" x 12" with 7" Min. Embedment into Concrete.
Increase AB Length as Necessary for the Required Embedment

SHEARWALL SCHEDULE

DESCRIPTION			NAILING[1]			TRANSFER ALTERNATIVES (18866)[2] (0254)[4] (6506)[5]			
NO.	SHEATHING MATERIAL	NO. OF SIDES	SIZE	BOUNDARY SPACING	EDGE SPACING	5/8" A.B.[3]	LTP4	A35	ASD VALUE (plf)
1	15/32" CDX PLYWOOD	1	10d	4"	4"	48"	13"	16"	460

FOOTNOTES:
[1] Use COMMON NAILS ONLY for all sheathing. Field nailing is 12" o.c. Provide 3x framing at all panel joints UNO.
[2] Anchor bolts for shearwalls must have 3" x 3" x 0.229" plate washers min., install per 2021 AWC SDPWS 4.3.6.4.3.
[3] Value based on 2018 AWC NDS Table 12E for light-framed construction.
[4] Value based on Simpson Strong-Tie Wood Construction Connectors 2024-2025 catalog, for short term loading connector capacity.
[5] LTP4 installed over sheathing shall use 8d common nails (0.131" x 2-1/2") UNO per plan.

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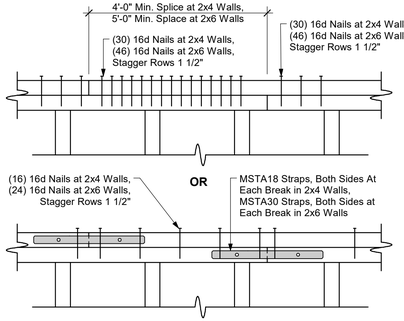
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Checked By: NBW
Scale: 3/8" = 1'-0"
Job No: 240434

Sheet Title:
FOUNDATION & ROOF FRAMING PLAN

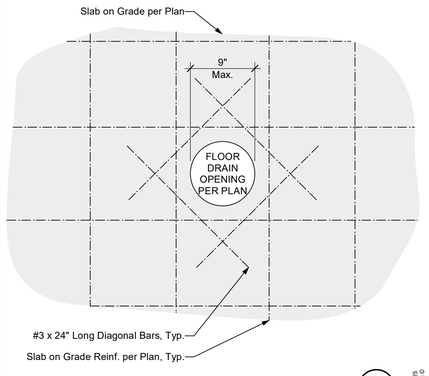
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NOTE: Frame Walls w/ 2x Min. Douglas Fir Studs & Plates, Grade per Specifications UNO on Plan at Plates Wider than 2x6, Use 2-2x6 Splice Values UNO

TYP. 2-2X TOP PLATE SPLICE (17)

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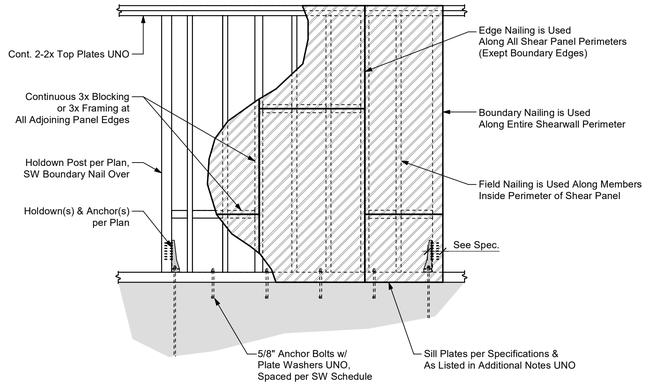


FLOOR DRAIN OPENING IN SOG (18)

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Additional Notes: Refer to "Wood" Section of the Specifications for Add'l Framing Requirements

1. All Nails Shall have 3/8" Edge Distance, Min.
2. Sheathing for Single-Sided Shearwalls May be Placed on Either Face of Wall UNO; Provide Min. Length Specified and Coordinate w/ Arch. Finishes
3. Sheathing Panels Shall Abut Along CL of Framing Members; Min. Plywood Dimension for Use in SW Shall be 12"
4. For Shearwalls with Capacity Over 350 plf, 3x Members are Required for All Framing Members Receiving Edge Nailing from Abutting Panels and Panel Joint and Sill Plate Nailing Shall be Staggered in All Cases per CBC Table 2306.3.
5. Sill Plates on Masonry or Concrete Must be 3x Pressure Treated; All Sill Plates For Two-Sided Shearwalls Must be 3x Members, Sill Plates on Wood Framing For One-Sided Shearwalls May be 2x Members; Wall Studs and Blocking at Adjoining Panel Edges Must be 3x or Larger
6. At All Exterior Walls and Interior Bearing Walls Not Noted as Shearwalls, Blocking Shall be Provided Between Joists and/or Rafters with A35, RBC, or LTP4 to Top Plates @ 16" o.c. at Floor and 24" o.c. at Roof Conditions UNO



SHEARWALL ELEVATION

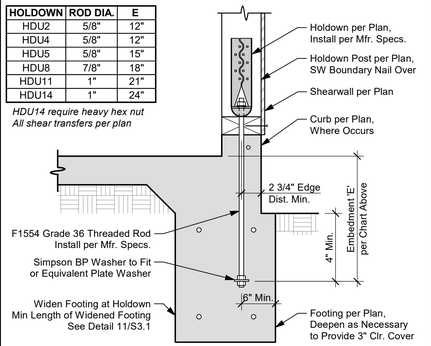
NOTE: All Shearwalls per Plan. Replace Multiple Studs with Posts as Indicated per Plan.

SHEARWALL SCHEDULE & NOTES (10)

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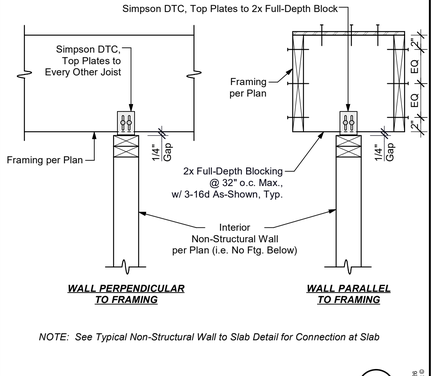
HOLDOWN	ROD DIA.	E
HDU2	5/8"	12"
HDU4	5/8"	12"
HDU5	5/8"	15"
HDU8	7/8"	18"
HDU11	1"	21"
HDU14	1"	24"

HDU14 require heavy hex nut
All shear transfers per plan



HOLDOWN TO FOUNDATION (5)

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WALL PERPENDICULAR TO FRAMING ***WALL PARALLEL TO FRAMING***

NOTE: See Typical Non-Structural Wall to Slab Detail for Connection at Slab

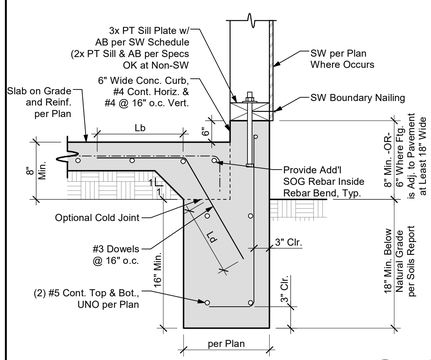
NON-STR. WALL TO FRAMING (6)

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NOTES:
1. *Sheathing Panels Shall ABUT Along CL of Framing Members.*
2. *Nail Edge Distance From Panel Edges and Member Edges per Specs.*

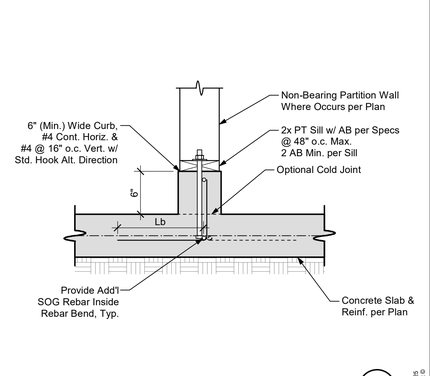
HORIZONTAL ROOF DIAPHRAGM (7)

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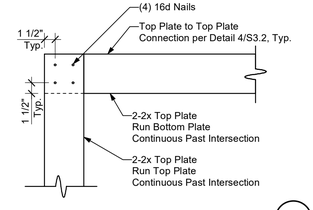
EXTERIOR FOUNDATION W/ CURB (1)

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NON-BEARING WALL TO SLAB (2)

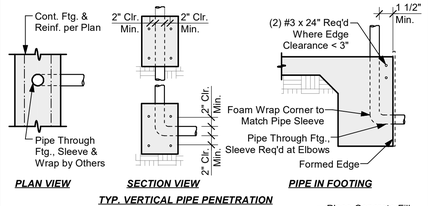
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TYP. TOP PLATE INTERSECTION (19)

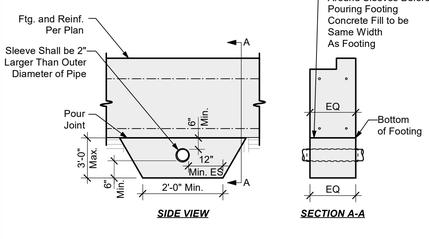
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NOTE: No pipe shall be located within 24" of a holdown anchor. Depth of footing may be determined by location of pipes. General contractor shall consult with mechanical contractor to determine exact depth and location.



PLAN VIEW ***SECTION VIEW*** ***PIPE IN FOOTING***

TYP. VERTICAL PIPE PENETRATION



SIDE VIEW ***SECTION A-A***

TYP. PIPE UNDER FOOTING

TYP. FOOTING PENETRATIONS (20)

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Notes:
1. Use the Lengths in this Schedule, Unless Noted Otherwise.
2. Use Length in () When Bar Cover = d_b or Less or Bar Clear Spacing is $2d_b$ or Less.
3. A Top Bar is a Horizontal Bar with More than 12" of Fresh Concrete Cast Below.

Abbreviations:
d_b = Bar Diameter
L_d = Tension Development Length
L_{dt} = Tension Development Length for a Top Bar
L_b = Class B Lap Splice Length, 1.3 L_d
L_{bt} = Class B Lap Splice Length for a Top Bar, 1.3 L_{dt}
L_{dh} = Tension Develpment Length for a Standard Hook

Tension Development and Lap Splice Lengths (in.)
For Uncoated and Galvanized Deformed Bars
Table A1(b): Grade 60, f´C = 4,000 psi

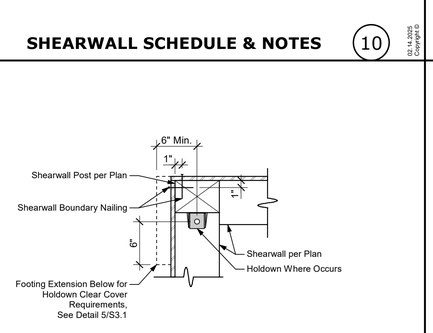
Bar Size	L_d	L_{dt}	L_b	L_{bt}	L_{dh}
#3	15 (22)	19 (28)	19 (28)	25 (37)	7
#4	19 (29)	25 (37)	25 (37)	33 (49)	11
#5	24 (36)	31 (47)	31 (47)	41 (61)	15
#6	29 (43)	37 (56)	37 (56)	49 (73)	20
#7	42 (63)	54 (81)	54 (81)	71 (106)	25
#8	48 (72)	62 (93)	62 (93)	81 (121)	30
#9	54 (81)	70 (105)	70 (105)	91 (136)	36
#10	61 (91)	79 (118)	79 (118)	102 (153)	43
#11	67 (101)	87 (131)	87 (131)	114 (170)	51
#14	81 (121)	105 (157)	---	---	66
#18	108 (161)	140 (209)	---	---	102

Standard Hooks
(Tables 7.1 - 7.2)

Bar Size	STD. HOOKS (TABLE 7.1) 90° D		STD. HOOKS (TABLE 7.1) 180° D		STIRRUP/TIE HOOKS (TABLE 7.2) 90° D		STIRRUP/TIE HOOKS (TABLE 7.2) 135° D		STIRRUP/TIE HOOKS (TABLE 7.2) 180° D	
	D	H_L	D	H_L	D	H_L	D	H_L	D	H_L
#3	2¼	4½	2¼	4	2	2¼	2	4¼	2	3¾
#4	3	6	3	4½	2½	3	2½	4¾	2½	4¼
#5	3¾	7½	3¾	5	3¼	3¾	3¼	6	3¼	4¾
#6	4½	9	4½	6	4½	9	4½	7¾	4½	6
#7	5¼	10½	5¼	7	5¼	10½	5¼	8¾	10	7
#8	6	12	6	8	6	12	6	10	11	8
#9	9½	13¾	9½	10½	NOT APPLICABLE FOR BAR SIZES					
#10	10¾	15¼	10¾	11¾						
#11	12	17	12	13						
#14	18¼	20½	18¼	17½						
#18	24	27	24	23¼						

TYP. LAPS, DEV. LENGTHS, & HOOKS (16)

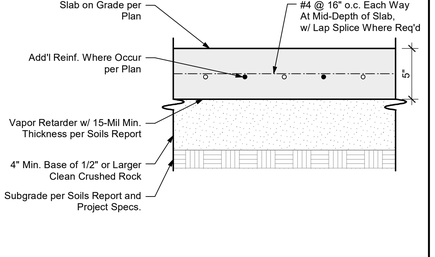
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"L" INTERSECTION, 2X6 WALLS

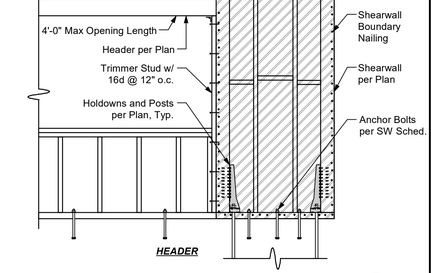
TYP. SHEARWALL INTERSECTIONS (11)

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SLAB ON GRADE (12)

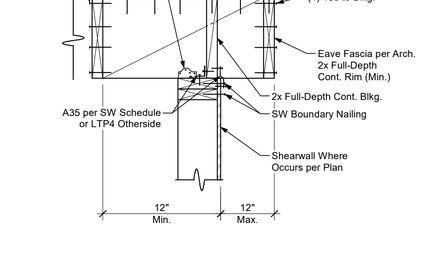
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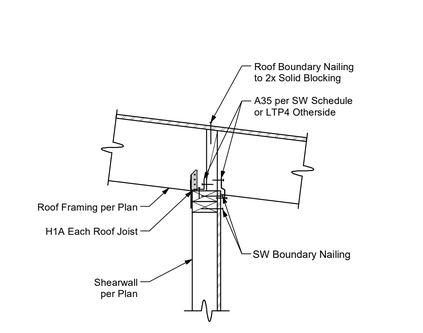
HEADER TO SHEARWALL (8)

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SHEAR TRANSFER AT RAKE WALL (4)

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SHEAR TRANSFER TO ROOF (3)

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Resubmittal #1	10/23/2025
Resubmittal #2	01/21/2026
Resubmittal #3	01/28/2026

Project Engineer:	MAM
Checked By:	NBW
Scale:	-
Job No:	240434

Sheet Title:

STRUCTURAL DETAILS

Sheet No.:

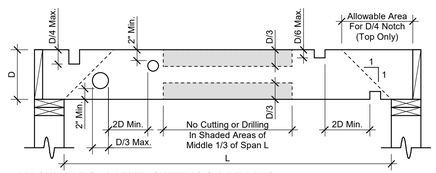
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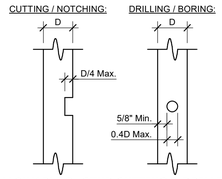
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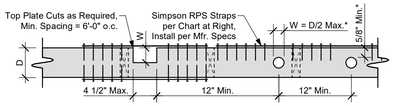
13



ALLOWABLE 2x RAFTER CUTTING & DRILLING



ALLOWABLE 2x STUD CUTTING & DRILLING



ALLOWABLE 2-2x TOP PLATE CUTTING & DRILLING (Top View)

REQUIRED STRAPS AT CUT/DRILLED TOP PLATES

Max. Cut/Hole Width	*Strap(s) Required*
Drilled Hole: W < D/2	RPS22 Each Side of Plates (Stagger Vertically)
Cut: W < D/2	(2) CTS218 on Side of Cut
Hole or Cut: W > D/2	(2) CTS218 on Each Side of Cut

** Treat drilled holes not meeting these requirements as holes with W > D/2.*

NOTE: These details only apply to the simple structural situations shown. They are not intended to apply to posts, beams, cantilevered members, or other structural members specified on the plans UNO. See the specs for additional related information. Contact T+S regarding cuts or drilling not covered.

ALLOWED 2x CUTTING & DRILLING 5

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BUILDING ELEMENTS	NUMBER & TYPE OF FASTENER	SPACING & LOCATION
ROOF		
1. BLOCKING BETWEEN CEILING JOISTS, RAFTERS OR TRUSSES TO TOP PLATE OR OTHER FRAMING BELOW	3-8D COMMON	EACH END, TOENAIL
BLOCKING BETWEEN RAFTERS OR TRUSS NOT AT THE WALL TOP PLATE, TO RAFTER OR TRUSS	2-8D COMMON	EACH END, TOENAIL
	2-16D COMMON	EACH END
FLAT BLOCKING TO TRUSS AND WEB FILLER	16D COMMON @ 6" O.C.	FACE NAIL
2. CEILING JOISTS TO TOP PLATE	3-8D COMMON	EACH JOIST, TOENAIL
3. CEILING JOIST NOT ATTACHED TO PARALLEL RAFTER, LAPS OVER PARTITIONS (NO THRUST) (SEE SECTION 2308.7.3.1, TABLE 2308.7.3.1)	3-16D COMMON	FACE NAIL
4. CEILING JOIST ATTACHED TO PARALLEL RAFTER (HEEL JOINT) (SEE SECTION 2308.7.3.1, TABLE 2308.7.3.1)	PER TABLE 2308.7.3.1	FACE NAIL
5. COLLAR TIE TO RAFTER	3-10D COMMON	FACE NAIL
6. RAFTER OR ROOF TRUSS TO TOP PLATE (SEE SECTION 2308.7.5, TABLE 2308.7.5)	3-10D COMMON	TOENAIL [C]
7. ROOF RAFTERS TO RIDGE VALLEY OR HIP RAFTERS; OR ROOF RAFTER TO 2-INCH RIDGE BEAM	2-16D COMMON	END NAIL
	3-10D COMMON	TOENAIL
WALL		
8. STUD TO STUD (NOT AT BRACED WALL PANELS)	16D COMMON	24" O.C. FACE NAIL
9. STUD TO STUD AND ABUTTING STUDS AT INTERSECTING WALL CORNERS (AT BRACED WALL PANELS)	16D COMMON	24" O.C. FACE NAIL
10. BUILT-UP HEADER (2" TO 2" HEADER)	16D COMMON	16" O.C. FACE NAIL
11. CONTINUOUS HEADER TO STUD	4-8D COMMON	TOENAIL
12. TOP PLATE TO TOP PLATE	8-16D COMMON	16" O.C. FACE NAIL
13 TOP PLATE TO TOP PLATE, AT END JOINTS	8-16D COMMON	EA. SIDE OF END JOINT, FACE NAIL (MIN. 24" LAP SPLICE LENGTH EA. SIDE OF END JOINT)
14. BOTTOM PLATE TO JOIST, RIM JOIST, BAND JOIST OR BLOCKING (NOT AT BRACED WALL PANELS)	16D COMMON	12" O.C. FACE NAIL
15. BOTTOM PLATE TO JOIST, RIM JOIST, BAND JOIST OR BLOCKING AT BRACED WALL PANELS	16D COMMON	16" O.C. FACE NAIL
16. STUD TO TOP OR BOTTOM PLATE	4-8D COMMON	TOENAIL
	2-16D COMMON	END NAIL
17. TOP OR BOTTOM PLATE TO STUD	2-16D COMMON	FACE NAIL
18. TOP PLATES, LAPS AT CORNERS AND INTERSECTIONS	2-16D COMMON	FACE NAIL
19. 1" BRACE TO EACH STUD AND PLATE	2-8D COMMON	FACE NAIL
20. 1" X 6" SHEATHING TO EACH BEARING	2-8D COMMON	FACE NAIL
21. 1" X 8" AND WIDER SHEATHING TO EACH BEARING	2-8D COMMON	FACE NAIL
FLOOR		
22. JOIST TO SILL, TOP PLATE, OR GIRDER	3-8D COMMON	TOENAIL
23. RIM JOIST, BAND JOIST, OR BLOCKING TO TOP PLATE, SILL OR OTHER FRAMING BELOW	3-8D COMMON	6" O.C., TOENAIL
24. 1" X 6" SUBFLOOR OR LESS TO EACH JOIST	2-8D COMMON	FACE NAIL
25. 2" SUBFLOOR TO JOIST OR GIRDER	2-16D COMMON	FACE NAIL
26. 2" PLANKS (PLANK & BEAM - FLOOR & ROOF)	2-16D COMMON	FACE NAIL
27. BUILT-UP GIRDERS & BEAMS, 2" LUMBER LAYERS	20D COMMON	32" O.C., FACE NAIL AT TOP AND BOTTOM STAGGERED ON OPPOSITE SIDES
	AND 2-20D COMMON	ENDS AND AT EACH SPLICE, FACE NAIL
28. LEDGER STRIP SUPPORTING JOISTS OR RAFTERS	3-16D COMMON	EACH JOIST OR RAFTER, FACE NAIL
29. JOIST TO BAND JOIST OR RIM JOIST	3-16D COMMON	END NAIL
30. BRIDGING OR BLOCKING TO JOISTS, RAFTER OR TRUSS	2-8D COMMON	EACH END, TOENAIL

WOOD STRUCTURAL PANELS (WSP), SUBFLOOR, ROOF AND INTERIOR WALL SHEATHING TO FRAMING AND PARTICLEBOARD WALL SHEATHING TO FRAMING [A]

		EDGES (IN.)	INTERMEDIATE SUPPORTS (IN.)
31. 3/8" - 1/2"	6D COMMON (SUBFLOOR AND WALL)	6	12
32. 19/32" - 3/4"	8D COMMON	6	12
33. 7/8" - 1 1/4"	10D COMMON	6	12
OTHER EXTERIOR WALL SHEATHING			
34. 1/2" FIBERBOARD SHEATHING [B]	1 1/2" GALVANIZED ROOFING NAIL; OR 1 1/4" 16 GAGE STAPLE WITH 7/16" OR 1" CROWN	3	6
35. 25/32" FIBERBOARD SHEATHING [B]	1 3/4" GALVANIZED ROOFING NAIL; OR 1 1/2 " 16 GAGE STAPLE WITH 7/16" OR 1" CROWN	3	6
OTHER EXTERIOR WALL SHEATHING			
36. 3/4" AND LESS	8D COMMON	6	12
37. 7/8" - 1"	8D COMMON	6	12
38. 1 1/8" - 1 1/4"	10D COMMON	6	12
PANEL SIDING TO FRAMING			
39. 1/2" OR LESS	6D CORROSION-RESISTANT SIDING; OR 6D CORROSION RESISTANT CASING	6	12
40. 5/8"	8D CORROSION-RESISTANT SIDING; OR 8D CORROSION RESISTANT CASING	6	12
INTERIOR PANELING			
41. 1/4"	4D CASING; OR 4D FINISH	6	12
42. 3/8"	6D CASING; OR 6D FINISH	6	12

A. NAILS SPACED AT 6 INCHES AT INTERMEDIATE SUPPORTS WHERE SPANS ARE 48 INCHES OR MORE. FOR NAILING OF WOOD STRUCTURAL PANEL AND PARTICLEBOARD DIAPHRAGMS AND SHEAR WALLS, REFER TO SECTION 2305. NAILS FOR WALL SHEATHING ARE PERMITTED TO BE COMMON, BOX OR CASING.

B. SPACING SHALL BE 6 INCHES ON CENTER ON THE EDGES AND 12 INCHES ON CENTER AT INTERMEDIATE SUPPORT FOR NONSTRUCTURAL APPLICATIONS. PANEL SUPPORTS AT 16 INCHES (20 INCHES IF STRENGTH AXIS IN THE LONG DIRECTION OF THE PANEL, UNLESS OTHERWISE MARKED).

C. WHERE A RAFTER IS FASTENED TO AN ADJACENT PARALLEL CEILING JOIST IN ACCORDANCE WITH THIS SCHEDULE AND THE CEILING JOIST IS FASTENED TO THE TOP PLATE IN ACCORDANCE WITH THIS SCHEDULE, THE NUMBER OF TOENAILS IN THE RAFTER SHALL BE PERMITTED TO BE REDUCED BY ONE NAIL.

TYP. WOOD FASTENING SCHEDULE 4

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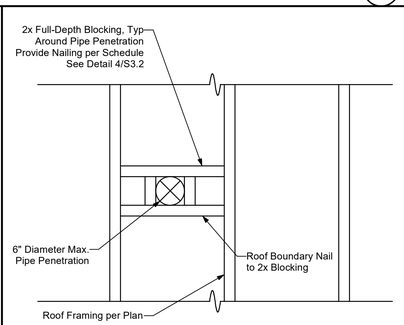
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SMALL DIAPHRAGM OPENING

6

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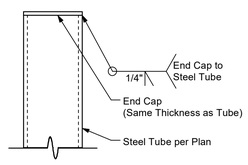
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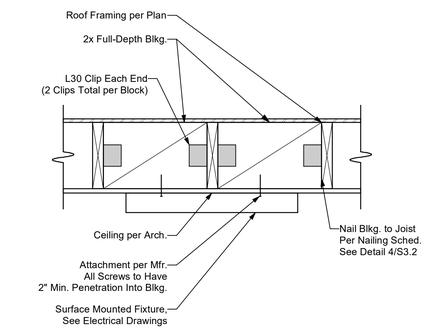
NOTE: Finish All Exposed Steel and Welds per Arch.
NOTE: Corrosion and Moisture Protection by Others



TYP. END CAP

11

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SURFACE MOUNTED FIXTURE

7

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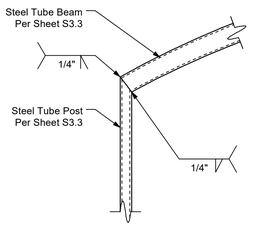
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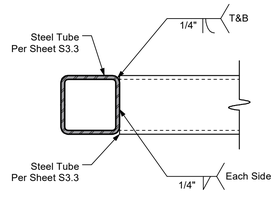


TYP. HSS TO HSS CONNECTION

12

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TYP. HSS TO HSS CONNECTION

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Resubmittal #3	01/28/2026

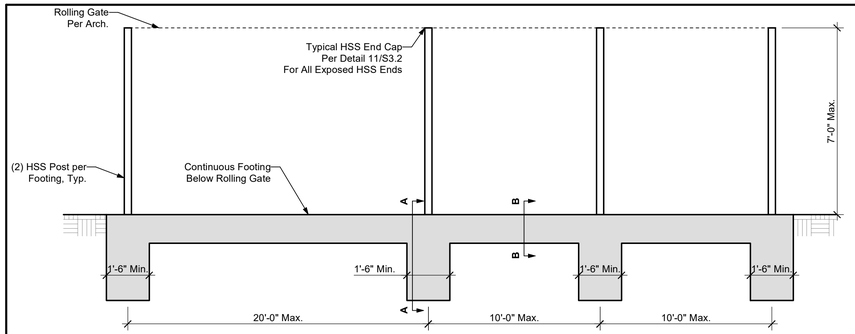
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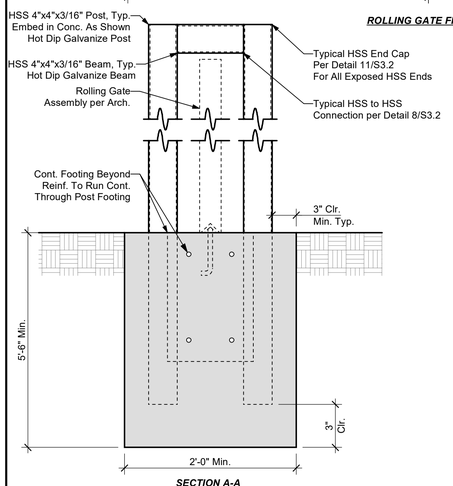
STRUCTURAL DETAILS

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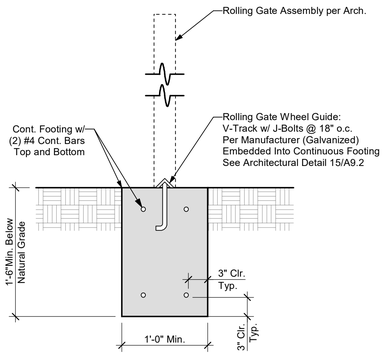
S3.2



ROLLING GATE FRONT VIEW



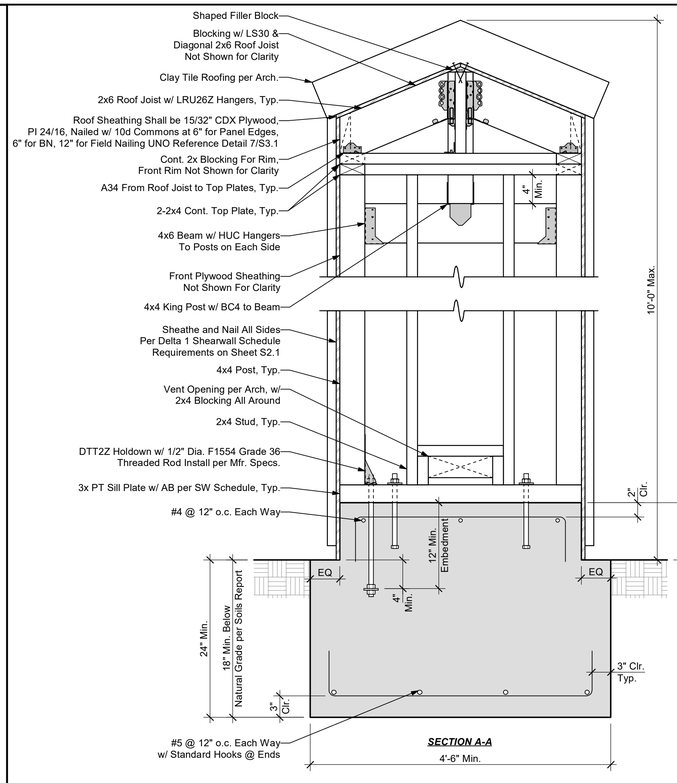
SECTION A-A



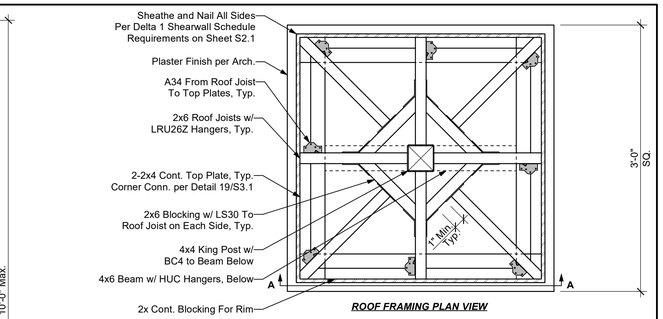
SECTION B-B

TUBE STEEL ROLLING GATE 14

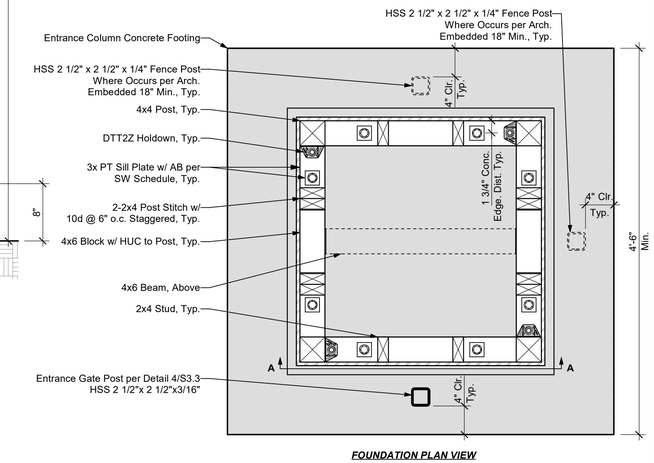
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SECTION A-A



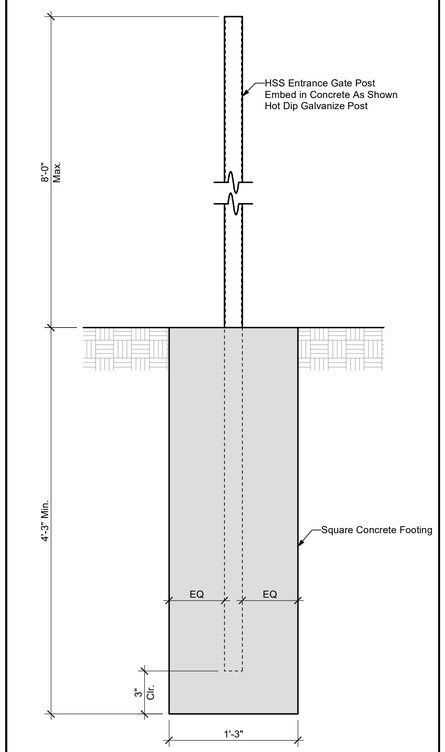
ROOF FRAMING PLAN VIEW



FOUNDATION PLAN VIEW

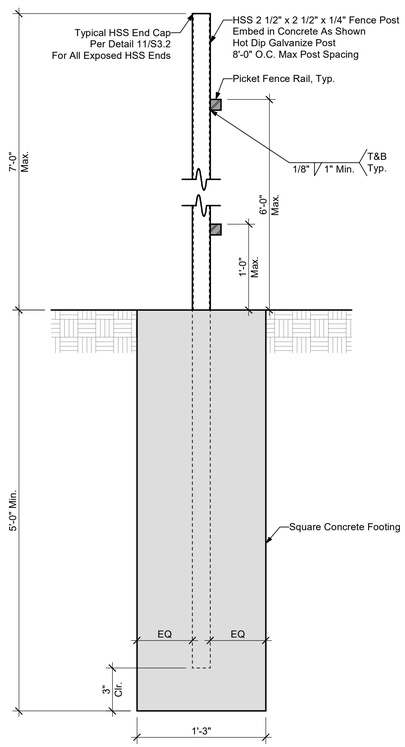
ENTRANCE COLUMN DETAIL 2

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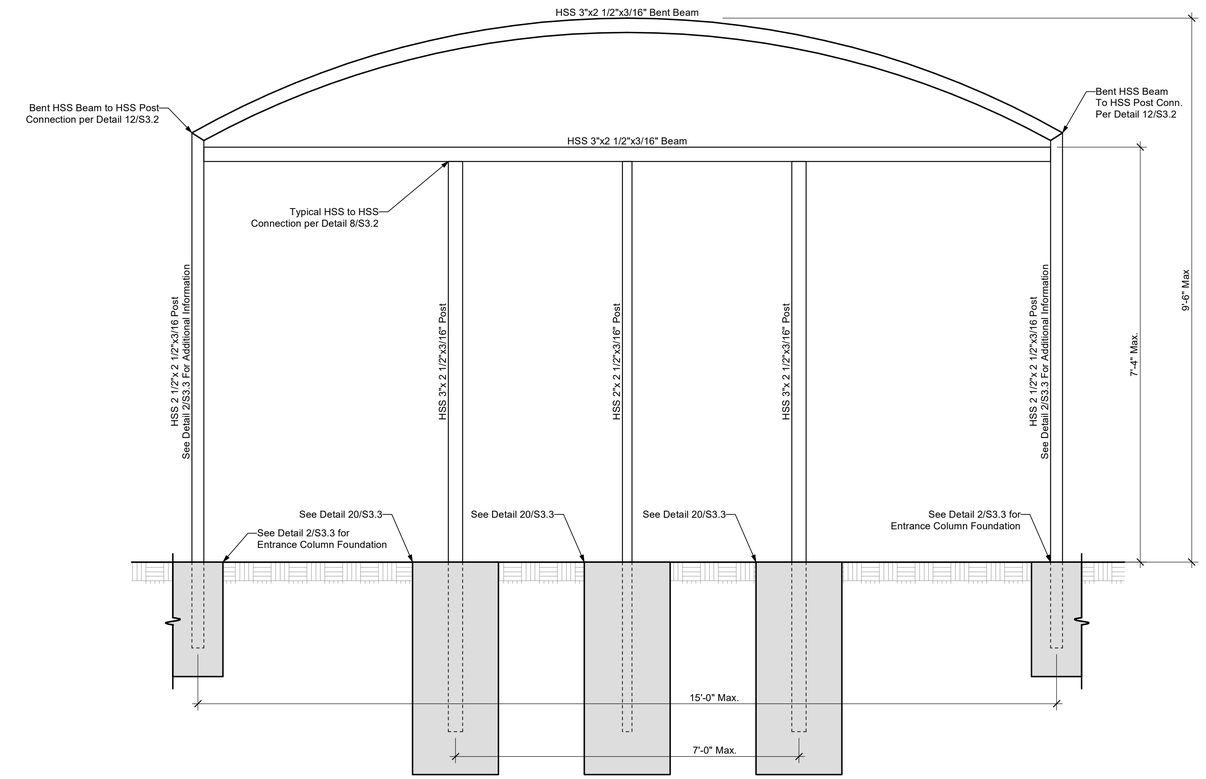
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ACCESSIBLE ENTRANCE GATE 4

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Project Engineer:	MAM
Checked By:	NBW
Scale:	-
Job No:	240434

Sheet Title:

STRUCTURAL DETAILS

Sheet No.:

S3.3

SYMBOL LEGEND

SINGLE LINE SYMBOL	DOUBLE LINE SYMBOL	DESCRIPTION
		LONG SWEEP 90° ELBOW - RECTANGULAR, ROUND OR OVAL
		45° ELBOW - RECTANGULAR, ROUND OR OVAL
		30° ELBOW - RECTANGULAR, ROUND OR OVAL
		90° ELBOW - RECTANGULAR DUCT WITH TURNING VANES
		45° LATERAL - ROUND TO ROUND OR OVAL TO OVAL
		90° TAKEOFF WITH 45° TAPER - RECTANGULAR TO RECTANGULAR (FOR BRANCH TAKEOFF LONGER THAN 50'-0", USE 15)
		90° TAKEOFF WITH 45° ELONGATED TEE - ROUND TO ROUND
		Y BRANCH - ROUND OR OVAL DUCT
		90° RADIUS SPLIT - RECTANGULAR DUCT, PROVIDE SPLITTER DAMPER, X/Y PROPORTIONAL SPLIT
		90° RECTANGULAR SPLIT - RECTANGULAR DUCT, PROVIDE SPLITTER DAMPER, X/Y PROPORTIONAL SPLIT
		TRANSITION - RECTANGULAR TO ROUND OR RECTANGULAR TO OVAL
		FLEXIBLE DUCT - ROUND
		FLEXIBLE DUCT - RECTANGULAR

SINGLE LINE SYMBOL	DOUBLE LINE SYMBOL	DESCRIPTION
		SECTION AT SUPPLY AIR OR MAKE-UP AIR DUCT UP
		SECTION AT RETURN AIR OR COMBUSTION AIR DUCT UP
		SECTION AT EXHAUST AIR OR RELIEF AIR DUCT UP
		SUPPLY AIR DUCT DOWN
		RETURN AIR DUCT DOWN
		EXHAUST AIR DUCT DOWN
		ROUND DUCT UP - SUPPLY, RETURN OR EXHAUST
		ROUND DUCT DOWN - SUPPLY, RETURN OR EXHAUST
		CEILING DIFFUSER - ONE, TWO, THREE AND FOUR WAY THROW
		CEILING - RETURN AND EXHAUST REGISTERS
		SIDEWALL - SUPPLY DIFFUSER, RETURN AND EXHAUST REGISTERS
		MANUAL BALANCE DAMPER WITH DUCT ACCESS DOOR
M	M	MOTORIZED BALANCE DAMPER WITH DUCT ACCESS DOOR
FSD OR F/D	FSD OR F/D	FIRE DAMPER WITH DUCT ACCESS DOOR FIRE/SMOKE DAMPER WITH DUCT ACCESS DOOR
24 x 12	24 x 12	ACOUSTICALLY LINED DUCT. DIMENSIONS ARE INSIDE

12x12 CD-1 — REGISTER NECK SIZE AND TAG
300 — DESIGN CFM
PANEL AT T-BAR CEILING

SYMBOL	ABBRV.	IDENTIFICATION
	CW	COLD WATER (DOMESTIC)
	HW	HOT WATER
	HWR	HOT WATER RETURN
	V	VENT
TP	TP	TRAP PRIMER LINE
W	S OR W	SOIL OR WASTE ABOVE GRADE
W	S OR W	SOIL OR WASTE BELOW GRADE
AW	AW	ACID WASTE
GW	GW	GREASE WASTE
RWL	RWL	RAIN WATER LEADER
OD	OD	OVERFLOW DRAIN
CD	CD	CONDENSATE DRAIN
		CAP
	CONT	CONTINUATION
		BALL VALVE
OR		VALVE
	CKV	CHECK VALVE
	T&PRV	TEMP. & PRESS. RELIEF VALVE
	GPR	GAS PRESSURE REGULATOR
		CIRCULATION PUMP (DOMESTIC)
	WHA	WATER HAMMER ARRESTOR
	TP	TRAP PRIMER ACCESS PANEL
	GCO/FCO	GRADE CLEAN-OUT/FLOOR CLEAN-OUT
	WCO	WALL CLEAN-OUT
	HB	HOSE BIBB
		UNION
	AN	PIPE ANCHOR
		FLEXIBLE CONNECTOR

SYMBOL	ABBRV.	IDENTIFICATION
	P.O.C.	POINT OF CONNECTION
		REMOVE EXISTING
		LINE BREAK
		TEE DOWN
		90 DOWN
		RISER
		CONCENTRIC & ECCENTRIC REDUCERS
	AD, AP	ACCESS DOOR, ACCESS PANEL
	MAV	MANUAL AIR VENT
T	T	THERMOSTAT MOUNTED @ 48" AFF. MAX.
CO2	CO2	CARBON DIOXIDE (CO2) SENSOR
$		SWITCH
	AD	AREA DRAIN
	FD	FLOOR DRAIN
	FS	FLOOR SINK
OR	VB	VALVE IN BOX
	TH	THERMOMETER
	RPBP	REDUCED PRESSURE BACKFLOW PREVENTER
	DCDA	DOUBLE CHECK DETECTOR ASSEMBLY
FC		EQUIPMENT DESIGNATION
A-1		TAG NUMBER
1 / MP2.1		SECTION 1 / SHEET MP2.1

ABBREVIATIONS

&	AND
°F	DEGREES FAHRENHEIT
AAV	AUTOMATIC AIR VENT
AC	AIR CONDITIONER
AD	ACCESS DOOR
AFF	ABOVE FINISH FLOOR
AFUE	ANNUAL FUEL UTILIZATION EFFICIENCY
AL	ACOUSTICALLY LINED
AMP	AMPERE
AN	PIPE ANCHOR
AP	ACCESS PANEL
APPROX	APPROXIMATE
ARCH	ARCHITECT / ARCHITECTURAL
AW	ACID WASTE
BDD	BACK DRAFT DAMPER
BFP	BACKFLOW PREVENTER
BHP	BRAKE HORSEPOWER
BLDG	BUILDING
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNITS PER HOUR
BTWN	BETWEEN
CA	COMBUSTION AIR
CD	CONDENSATE DRAIN
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CIRC	CIRCULATING
℄	CENTERLINE
CLG	COOLING, CEILING
CLR	CLEAR
CONC	CONCRETE
CONN	CONNECTION
CONT	CONTINUED, CONTINUATION
COOL	COOLING
COP	COEFFICIENT OF PERFORMANCE
CW	COLD WATER
D/L	DOOR LOUVER
DB	DRY BULB
DCV	DOUBLE CHECK VALVE
DF	DRINKING FOUNTAIN
DN	DOWN
DP	DIFFERENTIAL PRESSURE
DWGS	DRAWINGS
(E)	EXISTING
EA	EXHAUST AIR
EAD	EXHAUST AIR DAMPER
EAT	ENTERING AIR TEMPERATURE
EDB	ENTERING DRY BULB
EER	ENERGY EFFICIENCY RATIO
EFF	EFFICIENCY
ELEC	ELECTRICAL
ELEV	ELEVATION
ENT	ENTERING
EQ	EQUAL
EQUIP	EQUIPMENT
ESP	EXTERNAL STATIC PRESSURE
EW	ENTERING WATER
EWB	ENTERING WET BULB
EWT	ENTERING WATER TEMPERATURE
EXT	EXTERIOR
FD	FLOOR DRAIN
FFE	FINISHED FLOOR ELEVATION
FLA	FULL LOAD AMPS
FLEX	FLEXIBLE
FPM	FEET PER MINUTE
FS	FLOOR SINK
FT	FEET
FT HD	FEET HEAD
FTR	FLUE THRU ROOF
G	GAS - LOW PRESSURE
GA	GAUGE
GAL	GALLON
GPM	GALLONS PER MINUTE
GPR	GAS PRESSURE REGULATOR
GW	GREASE WASTE PIPING
HP	HORSEPOWER
HR	HOUR
HTG	HEATING
HW	HOT WATER
HWR	HOT WATER RETURN
HZ	HERTZ
IE	INVERT ELEVATION
IN	INCH
INV	INVERT
KW	KILOWATTS
KWH	KILOWATT HOUR
LAT	LEAVING AIR TEMPERATURE
LBS	POUNDS
LVR	LOUVER
LWB	LEAVING WET BULB
LWT	LEAVING WATER TEMPERATURE
MAD, MD	MANUAL AIR DAMPER
MAV	MANUAL AIR VENT
MAX	MAXIMUM
MBH	1000 BTU PER HOUR
MCA	MINIMUM CIRCUIT AMPS
MCP	MECHANICAL CONTROL PANEL
MECH	MECHANICAL
MFR	MANUFACTURER
MPG	GAS - MEDIUM PRESSURE
MIN	MINIMUM
MOCP	MAXIMUM OVERCURRENT PROTECTION
(N)	NEW
NC	NORMALLY CLOSED
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OAD	OUTSIDE AIR DAMPER
OC	ON CENTER
OD	OUTSIDE DIAMETER
OFCI	OWNER FURNISHED, CONTRACTOR INSTALLED
P/T	PRESSURE/TEMPERATURE
PD	PRESSURE DROP
PH	PHASE
PLF	POUNDS PER LINEAR FOOT
POC	POINT OF CONNECTION
PRV	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH
PSI (G) (A)	POUNDS PER SQUARE INCH (GAUGE) (ABSOLUTE)
QTY	QUANTITY
RA	RETURN AIR
RAD	RETURN AIR DAMPER
RH	RELATIVE HUMIDITY
RL	REFRIGERANT LIQUID
RM	ROOM
RP	REDUCED PRESSURE
RPM	REVOLUTIONS PER MINUTE
RS	REFRIGERANT SUCTION
RV	RELIEF VALVE
SA	SUPPLY AIR
SC	SENSIBLE COOLING
SD	SMOKE DAMPER
SEER	SEASONAL ENERGY EFFICIENCY RATIO
SM	SHEET METAL
SOV	SHUT-OFF VALVE
SP	STATIC PRESSURE
SPEC	SPECIFICATION
SQ	SQUARE
SQFT, FT^2	SQUARE FEET
SQIN, IN^2	SQUARE INCHES
STRUCT	STRUCTURAL
T	THERMOSTAT, "X" INDICATES DEVICE CONTROLLED. 48" AFF (TO TOP OF STAT)
TC	TOTAL COOLING
TDH	TOTAL DYNAMIC HEAD
TEMP	TEMPERATURE
TH	THERMOMETER
THRU	THROUGH
TP	TRAP PRIMER
TSP	TOTAL STATIC PRESSURE
TV	TURNING VANES
TW	TEMPERED WATER
TYP	TYPICAL
UL	UNDERWRITER'S LABORATORIES
UON	UNLESS OTHERWISE NOTED
V	VOLT OR VENT
VB	VALVE IN VALVE BOX
VFD	VARIABLE FREQUENCY DRIVE
VTR	VENT THROUGH ROOF
W	WATTS OR WASTE
W/	WITH
WB	WET BULB
WC	WATER COLUMN
WH	WATER HEATER
WT	WEIGHT

CALIFORNIA GREEN BUILDING STANDARDS CODE

CALIFORNIA GREEN BUILDING STANDARDS CODE: HVAC SYSTEMS SHALL BE IN ACCORDANCE WITH THE SECTION OF THE CALIFORNIA GREEN BUILDING STANDARDS CODE LISTED BELOW:

5.506 - INDOOR AIR QUALITY
SECTION 5.505.1 OUTSIDE AIR DELIVERY - MECHANICAL VENTILATED SPACES IN BUILDINGS SHALL MEET THE MINIMUM REQUIREMENTS OF SECTION 120.1 (REQUIREMENTS FOR VENTILATION) OF THE CALIFORNIA ENERGY CODE, OR THE APPLICABLE LOCAL CODE, WHICHEVER IS MORE STRINGENT, AND DIVISION 1, CHAPTER 4 OF CCR, TITLE 8.
SECTION 5.506.3 CARBON DIOXIDE (CO2) MONITORING IN CLASSROOMS. EACH PUBLIC K-12 SCHOOL CLASSROOM, AS LISTED IN TABLE 120.1-A OF THE CALIFORNIA ENERGY CODE, SHALL BE EQUIPPED WITH A CARBON DIOXIDE MONITOR OR SENSOR THAT MEETS THE FOLLOWING REQUIREMENTS:

1. THE MONITOR OR SENSOR SHALL BE PERMANENTLY AFFIXED IN A TAMPER-PROOF MANNER IN EACH CLASSROOM BETWEEN 3 AND 6 FEET ABOVE THE FLOOR AND AT LEAST 5 FEET AWAY FROM DOORS AND OPERABLE WINDOWS.
2. WHEN THE MONITOR OR SENSOR IS NOT INTEGRAL TO AN ENERGY MANAGEMENT CONTROL SYSTEM (EMCS), THE MONITOR SHALL DISPLAY THE CARBON DIOXIDE READINGS ON THE DEVICE. WHEN THE SENSOR IS INTEGRAL TO AN EMCS, THE CARBON DIOXIDE READINGS SHALL BE AVAILABLE TO AND REGULARLY MONITORED BY FACILITY PERSONNEL.
3. A MONITOR SHALL PROVIDE NOTIFICATION THROUGH VISUAL INDICATOR ON THE MONITOR WHEN THE CARBON DIOXIDE LEVELS IN THE CLASSROOM HAVE EXCEEDED 1,100 PPM. A SENSOR INTEGRAL TO AN EMCS SHALL PROVIDE NOTIFICATION TO FACULTY PERSONNEL THROUGH A VISUAL AND/OR AUDIBLE INDICATOR WHEN THE CARBON DIOXIDE LEVELS IN THE CLASSROOM HAVE EXCEEDED 1,100 PPM.
4. THE MONITOR OR SENSOR SHALL MEASURE CARBON DIOXIDE LEVELS AT MINIMUM15-MINUTE INTERVALS AND SHALL MAINTAIN A RECORD OF PREVIOUS CARBON DIOXIDE MEASUREMENTS OF NOT LESS THAN 30 DAYS DURATION.
5. THE MONITOR OR SENSOR USED TO MEASURE CARBON DIOXIDE LEVELS SHALL HAVE THE CAPACITY TO MEASURE CARBON DIOXIDE LEVELS WITH A RANGE OF 400 PPM TO 2000 PPM OR GREATER.
6. THE MONITOR OR SENSOR SHALL BE CERTIFIED BY THE MANUFACTURER TO BE ACCURATE WITHIN 75 PPM AT 1,000 PPM CARBON DIOXIDE CONCENTRATION AND SHALL BE CERTIFIED BY THE MANUFACTURER TO REQUIRE CALIBRATION NO MORE FREQUENTLY THAN ONCE EVERY 5 YEARS.

5.508 - OUTDOOR AIR QUALITY
SECTION 5.508.1 - OZONE DEPLETION AND GREENHOUSE GAS REDUCTIONS - HVAC REFRIGERATION, AND FIRE SUPPRESSION EQUIPMENT SHALL COMPLY WITH SECTIONS 5.508.1.1 AND 5.508.1.2.
SECTION 5.508.1.1 CHLOROFLUOROCARBONS (CFCS) - HVAC, REFRIGERATION, AND FIRE SUPPRESSION EQUIPMENT SHALL NOT CONTAIN CFCS.
SECTION 5.508.1.2 HALONS - HVAC, REFRIGERATION, AND FIRE SUPPRESSION EQUIPMENT SHALL NOT CONTAIN HALONS.

ACCEPTANCE TESTING REQUIREMENTS

THE CALIFORNIA ENERGY CODE SECTION 10-103 REQUIRES ACCEPTANCE TESTING ON ALL NEWLY INSTALLED MECHANICAL SYSTEMS AFTER INSTALLATION AND BEFORE PROJECT COMPLETION. AN ACCEPTANCE TEST IS TO HELP ENSURE THAT NEWLY INSTALLED EQUIPMENT IS OPERATING AND IN COMPLIANCE WITH THE ENERGY CODE.

MECHANICAL SYSTEM ACCEPTANCE TESTS MUST BE PERFORMED BY A CERTIFIED MECHANICAL ACCEPTANCE TEST TECHNICIAN (ATT).

A LISTING OF CERTIFIED ATT CAN BE FOUND AT:
https://www.energy.ca.gov/programs-and-topics/programs/acceptance-test-technician-certification-provider-program/acceptance

THE ACCEPTANCE TESTING PROCEDURES MUST BE REPEATED, AND DEFICIENCIES MUST BE CORRECTED BY THE BUILDER OR INSTALLING CONTRACTOR UNTIL THE CONSTRUCTION/INSTALLATION OF THE SPECIFIED SYSTEMS CONFORM AND PASS THE REQUIRED ACCEPTANCE CRITERIA.

PROJECT INSPECTORS WILL COLLECT THE FORMS TO CONFIRM THAT THE REQUIRED ACCEPTANCE TESTS HAVE BEEN COMPLETED.

LIST OF GOVERNING CODES

2022 CALIFORNIA BUILDING STANDARDS ADMINISTRATIVE CODE, PART 1, TITLE 24, C.C.R.
2022 CALIFORNIA BUILDING CODE (CBC), PART 2, TITLE 24, C.C.R.
2022 CALIFORNIA ELECTRICAL CODE, PART 3, TITLE 24, C.C.R.
2022 CALIFORNIA MECHANICAL CODE (CMC), PART 4, TITLE 24, C.C.R.
2022 CALIFORNIA PLUMBING CODE (CPC), PART 5, TITLE 24, C.C.R.
2022 CALIFORNIA ENERGY CODE (CEC), PART 6, TITLE 24, C.C.R.
2022 CALIFORNIA FIRE CODE (CFC), PART 9, TITLE 24, C.C.R.
2022 CALIFORNIA GREEN BUILDING STANDARDS CODE, PART 11, TITLE 24, C.C.R.
2022 CALIFORNIA REFERENCED STANDARDS CODE, PART 12, TITLE 24, C.C.R.
TITLE 19, C.C.R., PUBLIC SAFETY, STATE FIRE MARSHAL REGULATIONS.

ALL SECTION NUMBERS BELOW REFER TO GROUP 1, CHAPTER 4, PART 1, TITLE 24, C.C.R.

1. ADDENDA, CONSTRUCTION CHANGES PER SECTION 4-338.
2. INSPECTOR APPROVED BY DSA. INSPECTOR AND CONTINUOUS INSPECTION OF WORK PER SECTION 4-333(b) AND 4-342.
3. TESTS AND TESTING LABORATORY PER SECTION 4-335.
4. SPECIAL INSPECTION PER SECTION 4-333(c).
5. CONTRACTOR SHALL SUBMIT VERIFIED REPORTS PER SECTION 4-336 AND 4-343(c).
6. ADMINISTRATION OF CONSTRUCTION PER PART 1, TITLE 24, C.C.R. - DUTIES OF ARCHITECT, STRUCTURAL ENGINEER OR PROFESSIONAL ENGINEER PER SECTION 4-333(a) AND 4-341.
7. GOVERNING CODES: TITLE 24.
8. A COPY OF PARTS 1, 2, 3, 4, AND 5 OF TITLE 24 SHALL BE KEPT AVAILABLE IN THE FIELD DURING CONSTRUCTION.
9. DSA SHALL BE NOTIFIED OF START OF CONSTRUCTION PER SECTION 4-331.
10. SUPERVISION BY THE DIVISION OF THE STATE ARCHITECT PER SECTION 4-334.

DSA GENERAL NOTES

1. SHOULD ANY CONDITIONS DEVELOP NOT COVERED BY THE CONTRACT DOCUMENTS, A CONSTRUCTION CHANGE DOCUMENT DETAILING AND SPECIFYING THE REQUIRED WORK SHALL BE SUBMITTED TO AND APPROVED BY DSA BEFORE PROCEEDING WITH THE WORK.
2. THE SEISMIC SUPPORT AND ANCHORAGE OF THE EQUIPMENT DESCRIBED ON THESE DRAWINGS HAVE BEEN ENGINEERED BY THE ENGINEER OF RECORD FOR CONFORMANCE WITH APPROPRIATE BUILDING CODES. THE ENGINEER OF RECORD WAS NOT RESPONSIBLE FOR THE EQUIPMENT DESIGN.
3. ALL MECHANICAL AND PLUMBING EQUIPMENT SHALL BE BRACED OR ANCHORED TO RESIST A HORIZONTAL FORCE ACTING IN ANY DIRECTION USING THE CRITERIA FROM CHAPTER 16A CALIFORNIA BUILDING CODE (CBC) 2022.
4. WHERE ANCHORAGE DETAILS ARE NOT SHOWN ON THE DRAWINGS, THE FIELD INSTALLATION SHALL BE SUBJECT TO THE APPROVAL OF THE STRUCTURAL ENGINEER AND THE FIELD REPRESENTATIVE OF THE DIVISION OF THE STATE ARCHITECT.
5. NO DEMOLITION SHALL BEGIN UNTIL PLANS INCLUDING THE DEMOLITION WORK HAVE BEEN APPROVED BY DSA.

MEP COMPONENT ANCHORAGE NOTE

ALL MECHANICAL, PLUMBING, AND ELECTRICAL COMPONENTS SHALL BE ANCHORED AND INSTALLED PER THE DETAILS ON THE DSA-APPROVED CONSTRUCTION DOCUMENTS. THE FOLLOWING COMPONENTS SHALL BE ANCHORED OR BRACED TO MEET THE FORCE AND DISPLACEMENT REQUIREMENTS PRESCRIBED IN THE 2022 CBC SECTIONS 1617A.1.18 THROUGH 1617A.1.26 AND ASCE 7-16 CHAPTERS 13, 26, AND 30:

1. ALL PERMANENT EQUIPMENT AND COMPONENTS.
2. TEMPORARY, MOVABLE OR MOBILE EQUIPMENT THAT IS PERMANENTLY ATTACHED (E.G., HARD WIRED) TO THE BUILDING UTILITY SERVICES SUCH AS ELECTRICITY, GAS OR WATER. "PERMANENTLY ATTACHED" SHALL INCLUDE ALL ELECTRICAL CONNECTIONS EXCEPT PLUGS FOR 110/220 VOLT RECEPTACLES HAVING A FLEXIBLE CABLE.
3. TEMPORARY, MOVABLE OR MOBILE EQUIPMENT WHICH IS HEAVIER THAN 400 POUNDS OR HAS A CENTER OF MASS LOCATED 4 FEET OR MORE ABOVE THE ADJACENT FLOOR OR ROOF LEVEL THAT DIRECTLY SUPPORT THE COMPONENT IS REQUIRED TO BE RESTRAINED IN A MANNER APPROVED BY DSA.

THE FOLLOWING MECHANICAL AND ELECTRICAL COMPONENTS SHALL BE POSITIVELY ATTACHED TO THE STRUCTURE BUT NEED NOT DEMONSTRATE DESIGN COMPLIANCE WITH THE REFERENCES NOTED ABOVE. THESE COMPONENTS SHALL HAVE FLEXIBLE CONNECTIONS PROVIDED BETWEEN THE COMPONENT AND ASSOCIATED DUCTWORK, PIPING, AND CONDUIT. FLEXIBLE CONNECTIONS MUST ALLOW MOVEMENT IN BOTH TRANSVERSE AND LONGITUDINAL DIRECTIONS:

A. COMPONENTS WEIGHING LESS THAN 400 POUNDS AND HAVING A CENTER OF MASS LOCATED 4 FEET OR LESS ABOVE THE ADJACENT FLOOR OR ROOF LEVEL THAT DIRECTLY SUPPORT THE COMPONENT.
B. COMPONENTS WEIGHING LESS THAN 20 POUNDS, OR IN THE CASE OF DISTRIBUTED SYSTEMS, LESS THAN 5 POUNDS PER FOOT, WHICH ARE SUSPENDED FROM A ROOF OR FLOOR OR HUNG FROM A WALL.

THE ANCHORAGE OF ALL MECHANICAL, ELECTRICAL AND PLUMBING COMPONENTS SHALL BE SUBJECT TO THE APPROVAL OF THE DESIGN PROFESSIONAL IN GENERAL RESPONSIBLE CHARGE OR STRUCTURAL ENGINEER DELEGATED RESPONSIBILITY AND ACCEPTANCE BY DSA. THE PROJECT INSPECTOR WILL VERIFY THAT ALL COMPONENTS AND EQUIPMENT HAVE BEEN ANCHORED IN ACCORDANCE WITH THE ABOVE REQUIREMENTS.

PIPING, DUCTWORK, AND ELECTRICAL DISTRIBUTION SYSTEM BRACING NOTE

PIPING, DUCTWORK, AND ELECTRICAL DISTRIBUTION SYSTEMS SHALL BE BRACED TO COMPLY WITH THE FORCES AND DISPLACEMENTS PRESCRIBED IN ASCE 7-16 SECTION 13.3 AS DEFINED IN ASCE 7-16 SECTIONS 13.6.5, 13.6.6, 13.6.7, 13.6.8; AND 2022 CBC, SECTIONS 1617A.1.24, 1617A.1.25, AND 1617A.1.26.

THE METHOD OF SHOWING BRACING AND ATTACHMENTS TO THE STRUCTURE FOR THE IDENTIFIED DISTRIBUTION SYSTEM ARE AS NOTED BELOW AND SHALL BE IN ACCORDANCE WITH DSA IR 16-13. EACH SYSTEM SHALL BE DESIGNED BY A STRUCTURAL ENGINEER AND COORDINATED WITH THE STRUCTURAL BUILDING DESIGN.

MECHANICAL PIPING (MP), MECHANICAL DUCTS (MD), PLUMBING PIPING (PP), ELECTRICAL DISTRIBUTION SYSTEMS (E):

MP [X] MD [X] PP [ ] E [ ] - OPTION 1: IR 16-13 SECTION 2.1: PROJECT SPECIFIC DESIGN.
SHEET NUMBERS: ____________

MP [ ] MD [ ] PP [ ] E [ ] - OPTION 2: IR 16-13 SECTION 2.2: DESIGN BASED ON OSHPD OPM, PART OF PROJECT SUBMITTAL.
OPM NUMBERS: ____________
SHEET NUMBERS: ____________

MP [ ] MD [ ] PP [ ] E [ ] - OPTION 3: IR 16-13 SECTION 2.2.6: DESIGN BASED ON OSHPD OPM, DEFERRED SUBMITTAL.

GENERAL NOTES

1. CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMISSION OF FINAL BID TO VERIFY ALL EXISTING SITE CONDITIONS WHICH MAY AFFECT THE COMPLETION OF THE INSTALLATION. ALL METHODS AND REQUIREMENTS FOR INSTALLATION SHALL BE DETERMINED PRIOR TO BID DATE. CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER OF RECORD OF ANY REQUIRED MODIFICATIONS WHICH ARE NOT REFERENCED ON THESE PLANS PRIOR TO SUBMITTING BID. SUBMITTAL OF THE CONTRACTOR'S BID DEMONSTRATES THE CONTRACTOR'S AWARENESS OF ALL SITE CONDITIONS AND REQUIRED WORK TO BE PERFORMED.
2. CONTRACTOR SHALL INCLUDE AND PROVIDE IN BID ALL LABOR AND MATERIALS NECESSARY FOR A COMPLETE AND OPERATIONAL INSTALLATION OF ALL SYSTEMS.
3. THE DRAWINGS INCLUDED IN THIS SET ARE DIAGRAMMATIC. THEY ARE REPRESENTATIVE OF THE ENGINEER OF RECORD'S DESIGN INTENT FOR ALL EQUIPMENT AND RELATED PIPING ETC. INDIVIDUAL POWER NEEDS, CONTROLS AND OTHER CONNECTIONS SHALL BE COORDINATED AND COMPLETED/ PROVIDED FOR COMPLETE SYSTEM OPERATION BY CONTRACTOR.
4. EQUIPMENT LOCATIONS AND PIPE ROUTING ARE NOT PRECISE AND SHALL BE COORDINATED, VERIFIED, AND DETERMINED IN THE FIELD. CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND ROUTE PIPING IN LOCATIONS WHICH MEET CODE REQUIREMENTS AND DO NOT INTERFERE WITH ANY BUILDING STRUCTURES, UTILITIES, OR OTHER TRADE EQUIPMENT.
5. (E) DUCTWORK AND ITEMS TO BE REMOVED ARE SHOWN HATCHED. SEE LEGEND. COORDINATE CLOSELY WITH (N) DUCTWORK AND P.O.C.'S SHOWN. ALL OTHER (E) DUCTWORK, ETC. TO REMAIN.
6. ALL EQUIPMENT, EQUIPMENT CONNECTIONS, PIPING, MOUNTING LOCATIONS ETC. ARE TO BE VERIFIED WITH OWNER'S REPRESENTATIVE AND EQUIPMENT SUPPLIER PRIOR TO BEGINNING OF THE ROUGH-IN.
7. ALL WORK SHALL BE PERFORMED TO STATE, LOCAL, NATIONAL AND DISTRICT STANDARDS AND CODES. COORDINATE SPECIFIC REQUIREMENTS WITH DISTRICT STANDARDS AND AUTHORITY HAVING JURISDICTION.
8. ALL EQUIPMENT SHALL BE NEW AND CLEARLY LABELED AND IDENTIFIED. LABELS SHALL NOT BE COVERED BY OTHER CONSTRUCTION ELEMENTS.
9. UNLESS OTHERWISE NOTED IN CONTRACT DOCUMENTS, CONTRACTOR SHALL GUARANTEE ALL EQUIPMENT AND WORK FOR A PERIOD OF ONE YEAR.
10. UNLESS OTHERWISE NOTED OR REFERENCED ON THE DRAWINGS, EVERYTHING IS NEW.
11. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL REQUIRED SAW CUTTING, CORE DRILLING, PATCHING, REFINISHING, ETC. AS REQUIRED FOR INSTALLATION OF SYSTEMS. ANY PENETRATIONS OR OPENINGS MADE IN WALLS OR STRUCTURES SHALL BE PATCHED AND/OR SEALED AS REQUIRED TO MAINTAIN THE INTEGRITY OF THE WALL OR STRUCTURE.
12. CONTRACTOR IS RESPONSIBLE FOR COMPLETING ALL FINAL CONNECTIONS TO OWNER FURNISHED EQUIPMENT AND SHALL INCLUDE THE PRICE OF INSTALLING ALL CONNECTIONS AS REQUIRED IN THEIR BIDS.
13. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR THE APPROVAL OF THE ENGINEER OF RECORD . ALL APPROVALS BY THE ENGINEER OF RECORD MUST BE SECURED PRIOR TO COMPLETION OF ANY PURCHASE ORDERS OR ROUGH-IN WORK.
14. THESE DRAWINGS AND ASSOCIATED SPECIFICATIONS ARE TO BE CONSIDERED CONTRACT DOCUMENTS FOR AGENCY REVIEW/ APPROVAL AND CONTRACTOR BIDDING PURPOSES.
15. AT THE COMPLETION OF THE PROJECT THE CONTRACTOR SHALL PROVIDE THE OWNER WITH A COMPLETE SET OF AS-BUILT DRAWINGS.
16. ANY AND ALL WORK THAT REQUIRES AN INTERRUPTION TO BUILDING SERVICES(S) (ELECTRICAL/ HVAC/ PLUMBING ETC.) MUST BE COORDINATED WITH THE DISTRICT A MINIMUM OF 48 HOURS IN ADVANCE. ANY SERVICE DOWNTIME SHALL NOT OCCUR DURING SCHOOL OPERATION HOURS.
17. IN INSTANCES WHERE A CONFLICT BETWEEN THE DRAWINGS AND THE SPECIFICATIONS AND INSTALLATION MANUALS FOR THE PROJECT EXISTS, THE CONTRACTOR SHALL ADHERE TO THE MORE STRINGENT REQUIREMENT.
18. ANY EXISTING BUILDING STRUCTURES OR SURFACES DAMAGED BY DEMOLITION OR DURING INSTALLATION ACTIVITIES SHALL BE REPAIRED, PATCHED, AND/OR REFINISHED TO THE SATISFACTION OF THE OWNER.
19. FURNISH AND INSTALL MANUAL AIR DAMPERS AT ALL DUCT BRANCH TAKEOFFS TO A SINGLE SUPPLY DIFFUSER.
20. FOR ALL VOLUME DAMPERS LOCATED ABOVE CEILINGS, PROVIDE 12" LONG 1/2" WIDE FLUORESCENT ORANGE TAPE TO MARK DAMPER LOCATIONS.
21. ALL DUCTWORK, CONDUITS, BOXES, SURFACE MOUNTED RACEWAYS, SUPPORT DEVICES, AND ASSOCIATED FITTINGS SHALL BE MOUNTED IN CONCEALED LOCATIONS ABOVE CEILINGS, DUCTS, TRUSSES, BEAMS, ETC. WHERE WORK HAS TO BE INSTALLED IN EXPOSED LOCATIONS, IT SHALL BE PAINTED TO MATCH THE ADJACENT SURFACES OR PER ARCHITECT'S DIRECTION.
22. CONTRACTOR SHALL PREPARE AND SUBMIT THE CALIFORNIA ENERGY COMMISSION TITLE 24 CERTIFICATE OF ACCEPTANCE FORMS RELATED TO INSTALLED EQUIPMENT AND SYSTEMS.
23. SAFETY: IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, THE CONTRACTOR WILL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS OF THE JOB SITE INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. THIS REQUIREMENT WILL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.
24. CONTRACTOR'S EQUIPMENT: COORDINATE WITH OWNER'S REPRESENTATIVE FOR APPROVED LOCATION OF JOB SITE ACCESS, PARKING, AND LOCATION OF CONTRACTOR'S EQUIPMENT AND MATERIAL STORAGE AREA. COORDINATE WITH OWNER FOR LOCATION AND PROCEDURES.
25. ALL BUILDING MATERIALS MUST BE ASBESTOS FREE.
26. CONSTRUCTION SCHEDULING: CONTRACTOR SHALL COORDINATE ALL CONSTRUCTION OPERATIONS WITH OWNER'S REPRESENTATIVE PRIOR TO SCHEDULING AND START OF THE WORK. CONTRACTOR SHALL PROVIDE PROTECTION TO ALL EXISTING SPACES AND SYSTEMS WHICH ARE IN USE, ADJOINING THE PROJECT, AND NOT PART OF THE PROJECT.
27. TITLE 24 COMPLIANCE: THE INTENT OF THESE DRAWINGS AND SPECIFICATIONS IS THAT THE WORK IS TO BE IN ACCORDANCE WITH TITLE 24, CALIFORNIA CODE OF REGULATIONS (2022 CBC). SHOULD ANY CONDITIONS BE DISCOVERED NOT COVERED BY THE CONTRACT DOCUMENTS WHERE IN THE FINISHED WORK DOES NOT COMPLY WITH 2022 CBC, A CONSTRUCTION CHANGE DOCUMENT OR A SEPARATE SET OF PLANS AND SPECIFICATIONS, DETAILING AND SPECIFYING THE REQUIRED WORK, SHALL BE SUBMITTED TO AND APPROVED BY THE AHJ BEFORE PROCEEDING WITH THE WORK.
28. THESE DOCUMENTS MAKE NO REPRESENTATION AS TO THE EXISTENCE OR LOCATION OF EXISTING HAZARDOUS MATERIALS (INCLUDING ASBESTOS CONTAINING MATERIALS) AT THE SITE. SHOULD CONTRACTOR DISCOVER SUSPECTED HAZARDOUS MATERIALS AT THE SITE HE SHALL IMMEDIATELY BRING IT TO THE ATTENTION OF THE OWNER'S REPRESENTATIVE PRIOR TO STARTING OR CONTINUING WORK INVOLVING THOSE MATERIALS.

DRAWING INDEX

MP0.1 SYMBOL LEGENDS, ABBREVIATIONS, NOTES - MECHANICAL & PLUMBING
MP0.2 SCHEDULES - MECHANICAL & PLUMBING
MP2.1 FLOOR PLANS - MECHANICAL & PLUMBING
MP6.1 DETAILS - MECHANICAL & PLUMBING

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REGISTERED PROFESSIONAL ENGINEER
METIN SERTTUNC
No. M31059
EXP. JUNE 30, 2027
MECHANICAL
STATE OF CALIFORNIA

SYMBOL LEGENDS, ABBREVIATIONS, NOTES - MECHANICAL & PLUMBING

TRACK + FIELD REPLACEMENT AND NEW RESTROOM BUILDING FOR:
CHUALAR UNION E.S.
24285 LINCOLN ST. CHUALAR, CA 93925
CHUALAR UNION SCHOOL DISTRICT

REV.	DATE	DESCRIPTION
	06/23/25	1ST PLAN CHECK SUBMITTAL
	10/24/25	1ST PLAN CHECK RE-SUBMITTAL

DATE: 05/15/2025
SCALE: AS NOTED
DRAWN:
JOB: 24033
SHEET:
MP0.1

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PLUMBING FIXTURES SCHEDULE

ITEM	DESCRIPTION	MANUFACTURER	MODEL NO.	ROUGH-IN CONNECTIONS (IN.)					FLOW (GPM)	MAX. FLOW ALLOWED (GPM)	FLUSH VALVE	SEAT	FAUCET	CARRIER	DRAIN ASSEMBLY	P-TRAP	STOP / SUPPLY	INSULATION KIT	ACCESSIBLE (Y/N)	NOTES
				TRAP	W	V	CW	HW												
DF-1	DRINKING FOUNTAIN W/ BOTTLE FILLER	ELKAY	VRCTLDDMWSK	1-1/2"	2"	1-1/2"	1/2"	—	—	—	—	—	—	—	—	MCGUIRE MCT150	BRASSCRAFT SCR19X C	—	Y	1, 2, 3
FD-1	FLOOR DRAIN	JAY R. SMITH	2005Y-P050-NB	2"	2"	1-1/2"	—	—	—	—	—	—	—	—	—	—	—	—	—	4
HB-1	HOSE BIB	WOODFORD	MODEL 21	—	—	—	3/4"	—	—	—	—	—	—	—	—	—	—	—	—	5
L-1	WALL HUNG LAVATORY (ACCESSIBLE HT.)	BEST SHEET METAL INC.	ADA-010M20195BB (304 SS)	1-1/2"	2"	1-1/2"	1/2"	—	0.5	0.5	—	—	CHICAGO FAUCETS E80-A11H-41ABCPT	INCLUDED WALL PLATES	1½" INTEGRAL	MCGUIRE MCT150	BRASSCRAFT SCR19X C	—	Y	1, 2, 6, 7
TP-1	TRAP PRIMER	PRECISION PLUMBING PRODUCTS	P2-500	—	—	—	1/2"	—	—	—	—	—	—	—	—	—	—	—	—	
WC-1	WALL HUNG WATER CLOSET (ACCESSIBLE HT.)	ACORN	DURA-WARE 2105-W-1.28-FVBO-HS-OFLC (304 SS)	INT	4"	2"	1-1/2"	—	1.28 GPF	1.28 GPF	SLOAN SENSOR FLUSHOMETER 140 ESS-1.28-TMO-SWB-HW (1.28 GPF)	ACORN HS-OFLC	—	JAY R. SMITH 0211Y-M54-XX	—	—	—	—	Y	1, 8, 9

1. FOR ACCESSIBLE FIXTURE HEIGHTS & LOCATIONS SEE ARCHITECT PLANS.
2. PROVIDE W/ BRASSCRAFT LOOSE KEY AND LEAD FREE BRAIDED WATER SUPPLY CONNECTOR.
3. DF RATED FOR OUTDOOR APPLICATION, STAINLESS STEEL CONSTRUCTION, VANDAL RESISTANT, NON-REFRIGERATED.
4. CAST IRON BODY, POLISHED NICKEL BRONZE STRAINER, WITH 1/2" TRAP PRIMER CONNECTION.
5. INSTALLED W/ SECURITY TEE HANDLE
6. PROVIDE LAVATORY W/ FAUCET BY OTHERS AND SINGLE CENTER FAUCET HOLE & VANDAL RESISTANT SS BOTTOM COVER.
7. TOUCH LESS FAUCET. PROVIDE W/ CHICAGO FAUCETS 243.260.00.1 TRANSFORMER & 242.340.00.1 BANK WIRE FOR HARD WIRED INSTALLATION. CONCEAL WIRES TUCKED UNDER LAVATORY IN CONDUIT.
8. PROVIDE WC W/ WALL SUPPLY FOR CONCEALED FLUSH VALVE, 1.28 GPF, FLUSH VALVE BY OTHERS, AND ACORN HS-OFLC HINGED OPEN FRONT SEAT NO COVER.
9. WC FLUSH VALVE IS TOUCH LESS W/ MANUAL OVERRIDE. PROVIDE W/ SLOAN EL-154 TRANSFORMER FOR HARD WIRED INSTALLATION.

EXHAUST FAN SCHEDULE

TAG	MANUFACTURER	MODEL NO.	AREA SERVED	AIRFLOW CFM	ESP IN. W.G.	FAN RPM	SOUND POWER SONES	MOTOR		WEIGHT LBS	MOUNTING DETAIL	NOTES
								HP / WATTS	V / PH			
EF-1	GREENHECK	SP-A125	RESTROOM	115	0.234	1100	0.6	21 WATTS	115 / 1	25	9/MP6.1	1, 2, 3
EF-2	GREENHECK	SP-A125	RESTROOM	115	0.234	1100	0.6	21 WATTS	115 / 1	25	9/MP6.1	1, 2, 3
EF-3	GREENHECK	SP-A125	STORAGE CHASE	115	0.234	1100	0.6	21 WATTS	115 / 1	25	9/MP6.1	1, 2, 4

1. PROVIDE W/ ROOF JACK CAP FOR PITCHED ROOF.
2. PROVIDE W/ DISCONNECT BY PLUG & INTEGRAL BACKDRAFT DAMPER.
3. CONTROL W/ LIGHTS
4. CONTROL W/ 1HR TIMER WALL SWITCH W/ 10 MIN. INTERVALS.

DOOR LOUVER SCHEDULE

TAG	MANUFACTURER	MODEL NO.	SIZE	NOTES
DL-1	TITUS	T-700L	SEE PLANS	1, 2

1. BORDER TYPE 1, SURFACE MOUNT.
2. PRIME AND PAINT TO MATCH DOOR COLOR OR PER ARCHITECT'S INSTRUCTIONS.

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REGISTERED PROFESSIONAL ENGINEER
MEITIN SERT LING
No. M31059
EXP. JUNE 30, 2027
MECHANICAL
STATE OF CALIFORNIA

SCHEDULES - MECHANICAL & PLUMBING

TRACK + FIELD REPLACEMENT AND NEW RESTROOM BUILDING FOR:

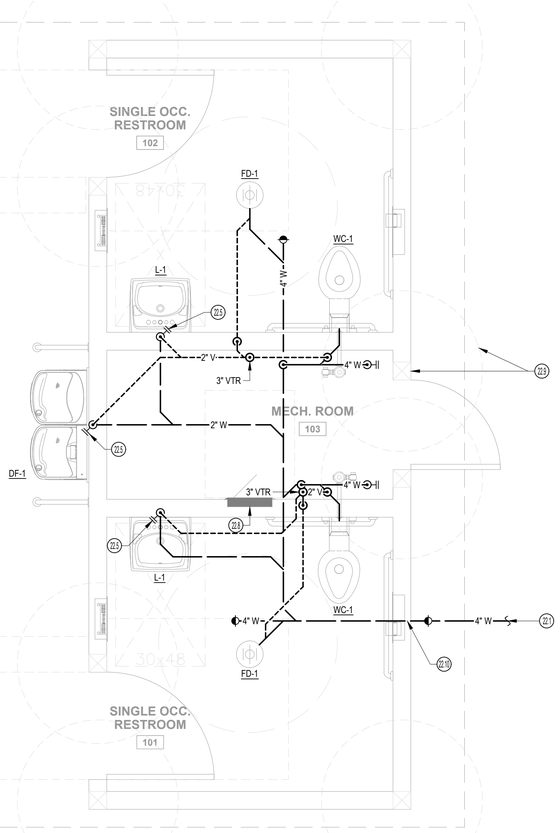
CHUALAR UNION E.S.

24285 LINCOLN ST. CHUALAR, CA 93925
CHUALAR UNION SCHOOL DISTRICT

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DRAWN:
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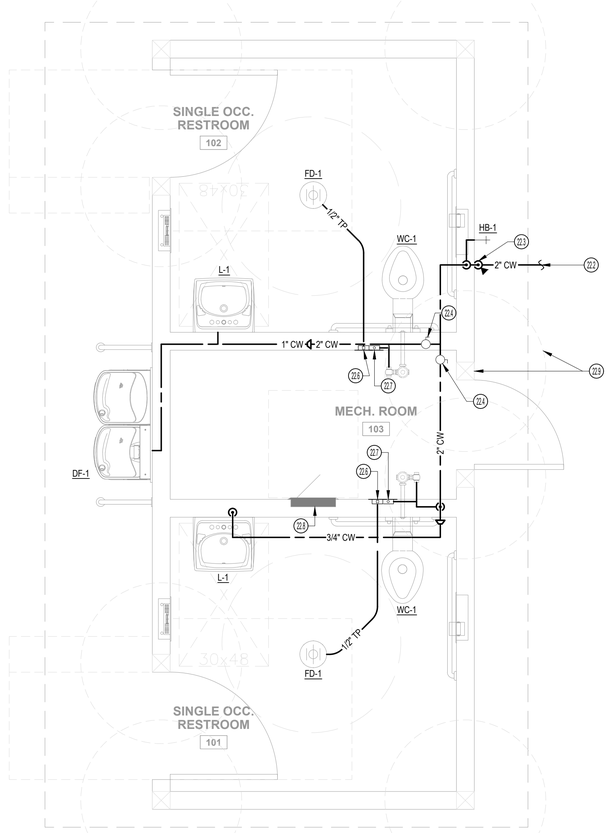
PROJECT NORTH

NORTH

1 MP2.1

NEW WASTE & VENT PIPING PLAN - PLUMBING

SCALE: 1/2" = 1'-0"



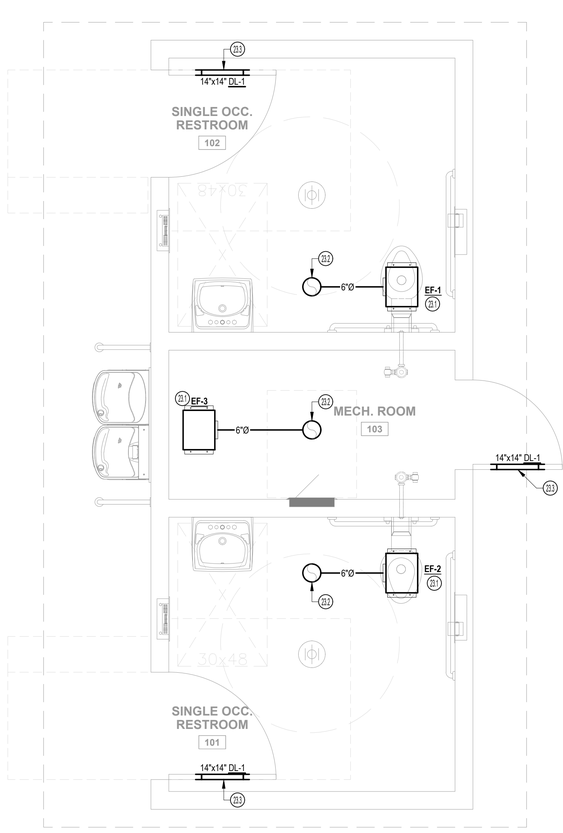
PROJECT NORTH

NORTH

2 MP2.1

NEW WATER PIPING PLAN - PLUMBING

SCALE: 1/2" = 1'-0"



PROJECT NORTH

NORTH

3 MP2.1

NEW FLOOR PLAN - MECHANICAL

SCALE: 1/2" = 1'-0"

GENERAL NOTES

1. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING AND NEW BUILDING STRUCTURES, SERVICES, AND OWNER'S PROPERTY DURING THE ENTIRE PERIOD OF CONSTRUCTION.
2. COORDINATE THE LOCATIONS OF ROOF/WALL OPENINGS, PENETRATIONS, PIPING, AND ALL PLUMBING EQUIPMENT WITH RESPECT TO BUILDING STRUCTURE AND OTHER BUILDING SERVICES TO AVOID CONFLICT.
3. EQUIPMENT LOCATIONS AND PIPE ROUTING ARE NOT PRECISE AND SHALL BE COORDINATED, VERIFIED, AND DETERMINED IN THE FIELD. CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND ROUTE PIPING IN LOCATIONS WHICH MEET CODE REQUIREMENTS AND DO NOT INTERFERE WITH ANY BUILDING STRUCTURES, UTILITIES, OR OTHER TRADE EQUIPMENT.
4. SAW CUT & TRENCH THE (E) PAVEMENT TO ACCOMMODATE NEW PIPING WORK. PATCH (E) PAVEMENT TO MATCH (E) WHEN WORK IS COMPLETE. UNDERGROUND PIPING (WASTE, VENT, TP) WITHIN BUILDING FOOTPRINT SHALL BE ROUGHED IN BEFORE NEW BUILDING FOUNDATION IS POURED.
5. INFORMATION SHOWN IS BASED ON AVAILABLE AS-BUILTS AND THE LOCATION OF ALL EQUIPMENT, PENETRATIONS, PIPING, AND OTHER PROJECTIONS SHOWN ON THE PLANS IS APPROXIMATE. NOT ALL EXISTING ITEMS ARE IDENTIFIED OR SHOWN ON THE PLANS. THE CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING EXISTING CONDITIONS, INCLUDING ALL RELEVANT DIMENSION,S EQUIPMENT COUNTS, AND LOCATIONS PRIOR TO SUBMITTING A BID.
6. SEE PLANS AND SPECIFICATIONS FOR ALL OTHER DISCIPLINES FOR ADDITIONAL SCOPE OF WORK THAT MAY NOT BE SHOWN HERE. COORDINATE WITH GENERAL CONTRACTOR TO CONFIRM ENTIRE SCOPE OF WORK HAS BEEN INCLUDED.
7. SEE ARCHITECT'S DRAWINGS FOR SEALING & FLASHING OF ROOF, WALL, AND FLOOR PENETRATIONS.
8. VTR, SEE DETAIL 1/MP6.1 FOR PIPE PENETRATION THRU ROOF.
9. FOR FD-1 FLOOR DRAINS SEE DETAIL 2/MP6.1.
10. FLOOR CLEAN OUT, SEE DETAIL 4/MP6.1.
11. WATER & VENT PIPE MAINS SHOWN ARE UP HIGH IN ATTIC SPACE

(22) NEW PLUMBING SHEET NOTES

22.1 WASTE PIPING BELOW GRADE, SEE CIVIL SITE PLAN FOR CONTINUATION.

22.2 CW PIPING BELOW GRADE, SEE CIVIL SITE PLAN FOR CONTINUATION.

22.3 CW, RISE ABOVE WALL SILL PLATE W/ SOV AND INTO BUILDING JANITOR STORAGE ROOM WALL.

22.4 CW W/ SHUT-OFF VALVE W/ ACCESS PANEL AND DISTRIBUTE TO FIXTURES.

22.5 WALL CLEAN OUT, SEE DETAIL 3/MP6.1.

22.6 TP IN WALL ACCESS PANEL, SEE DETAIL 5/MP6.1.

22.7 WHA IN WALL ACCESS PANEL, SEE DETAIL 6/MP6.1.

22.8 ELECTRICAL PANEL .KEEP PLUMBING CLEAR IN WALL BEHIND ELECTRICAL PANEL & OUT OF SERVICES CLEARANCES. REFER TO ELECTRICAL DRAWINGS FOR DETAILS.

22.9 STRUCTURAL FOUNDATION HOLD DOWNS SHOWN W/ 24" PIPE PENETRATION CLEARANCES, SEE STRUCTURAL DRAWINGS FOR DETAILS. KEEP ALL UNDERGROUND PIPE PENETRATIONS MIN. 24" FROM HOLD DOWN LOCATIONS, TYP. 8

22.10 FOR PIPE PENETRATIONS WITH SLEEVES THRU FOOTERS, REFER TO STRUCTURAL DETAIL 20/S3.1.

(23) NEW MECHANICL SHEET NOTES

23.1 INSTALL CEILING EXHAUST FAN, FOR MOUNTING SEE DETAIL 9/MP6.1.

23.2 EXHAUST DUCT UP THRU ROOF TO ROOF JACK CAP, SEE DETAIL 10/MP6.1.

23.3 INSTALL DOOR LOUVERS LOW ON DOOR.

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REGISTERED PROFESSIONAL ENGINEER
METIN SERT LYNCH
No. M31059
EXP. JUNE 30, 2027
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STATE OF CALIFORNIA

FLOOR PLANS - MECHANICAL & PLUMBING

TRACK + FIELD REPLACEMENT AND NEW RESTROOM BUILDING FOR:

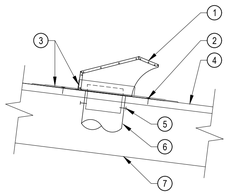
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CHUALAR UNION SCHOOL DISTRICT

REV	DATE	DESCRIPTION
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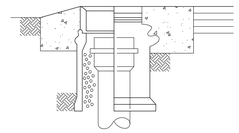
DETAIL NOTES:

1. ROOF JACK W/ FLASHING FLANGE FOR SLOPED ROOF.
2. SECURE FLASHING FLANGE TO ROOF DECK W/ ROOFING CEMENT, FASTENERS, & SEALANT OVER FASTENERS PER MANUFACTURER'S INSTRUCTIONS
3. FLASHING, SEE ARCHITECT'S DRAWINGS
4. ROOF DECK
5. SECURE DUCT TO ROOF CAP DUCT COLLAR W/ #10 SM SCREWS 4" O.C. MIN.
6. EXHAUST DUCT, SEE PLANS FOR SIZE
7. ROOF RAFTER

NOTES:

1. ROOF JACK CAP SHALL BE SIZED TO FIT BETWEEN ROOF RAFTERS.

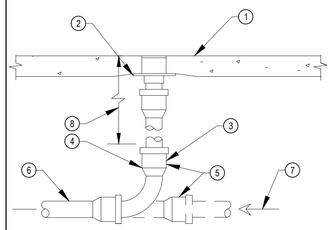
10 ROOF JACK FOR SLOPED ROOF N.T.S.



DETAIL NOTES:

1. PRECAST CONCRETE TRAFFIC RATED BOX W/ CAST IRON COVER ADJUST BOX TO FINISHED GRADE. CHRISTY G5C W/ MARK SS ON COVER.
2. CONCRETE COLLAR FINISH FLUSH W/ PAVING.
3. FINISHED PAVING WHERE OCCURS.
4. CLEANOUT PLUG.
5. CONCRETE COLLAR SLOPE 3/4" IN PLANTING AREA.
6. FINISHED GRADE WHERE OCCURS
7. 1/2"Ø GRAVEL MIN 12" DEPTH.

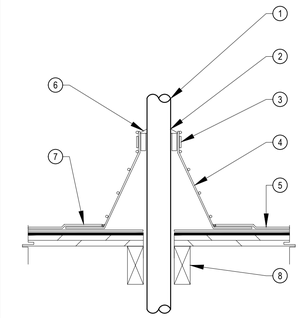
7 GRADE CLEANOUT DETAIL N.T.S.



DETAIL NOTES:

1. FINISHED FLOOR.
2. MEMBRANE CLAMP
3. LONG SWEEP ELBOW AT END OR TURN OF RUN
4. HUB AND SPIGOT CAST IRON PIPE BELOW FLOOR
5. COMBINED WYE AND EIGHT BEND IN RUN ENTER TOP OF PIPE.
6. SANITARY SEWER LINE
7. DIRECTION OF FLOW
8. AS REQUIRED DEPTH OF SEWER

4 FLOOR CLEANOUT DETAIL N.T.S.



DETAIL NOTES:

1. PIPE. SEE DWGS FOR SIZE.
2. SEAL WATERTIGHT WITH MASTIC.
3. STAINLESS STEEL CLAMPING RING.
4. PRE-MOLDED PIPE FLASHING.
5. ROOF. SEE ARCH DWGS.
6. PIPE SEAL MUST HAVE INTACT RIB AT TOP EDGE, REGARDLESS OF PIPE DIAMETER.
7. SEAL FLASHING WATERTIGHT TO ROOF PER ROOFING MANUFACTURER'S INSTRUCTIONS.
8. FOR BLOCKING SEE STRUCTURAL DETAIL 6/S3.2.

NOTE:

1. VERIFY ACTUAL ROOFING MATERIAL.

1 PIPE PENETRATION THRU ROOF

NOT USED

NOT USED

NOT USED

NOT USED

8 DETAIL

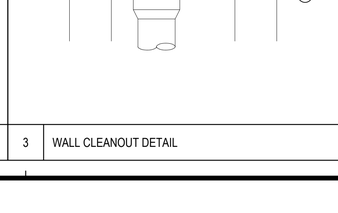
DETAIL NOTES:

1. 1/2" 90° STREET ELLS OFF TOP OF CW SUPPLY LINE TO PREVENT DEBRIS FROM ENTERING TRAP PRIMER.
2. TEE.
3. CW SUPPLY LINE.
4. ADAPTER.
5. 1/2" BALL VALVE.
6. WALL ACCESS PANEL.
7. TRAP PRIMER WITH INTEGRAL BACKFLOW PREVENTER AND VACUUM BREAKER. PPP PR-500 PRIME-RITE OR EQUAL. MOUNT TRAP PRIMER MIN 12" AFF FOR EVERY 20' OF PRIMER LINE.
8. UNION.
9. RUN 1/2" CW DOWN TO BELOW GRADE. THEN EXTEND TO FLOOR DRAIN.

NOTES:

1. UP TO FOUR (4) FLOOR DRAINS MAY BE SERVED BY ONE (1) TRAP PRIMER. INSTALL DISTRIBUTION UNIT PPP SERIES "DU" OR EQUAL, DOWNSTREAM OF UNION. DISTRIBUTION UNIT TO ALSO BE ACCESSIBLE FROM WALL ACCESS PANEL.
2. COMBINE SHUT-OFF VALVES, TRAP PRIMERS AND WATER HAMMER ARRESTORS BEHIND SINGLE WALL ACCESS PANEL WHERE POSSIBLE.

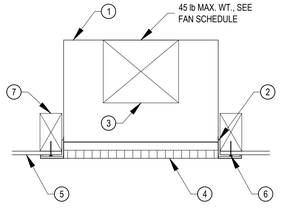
5 TRAP PRIMER N.T.S.



DETAIL NOTES:

1. FINISHED FLOOR
2. WATERPROOF MEMBRANE
3. NO-HUB CLAMP
4. TO VENT
5. P-TRAP
6. 1/2" TRAP PRIMER SUPPLY

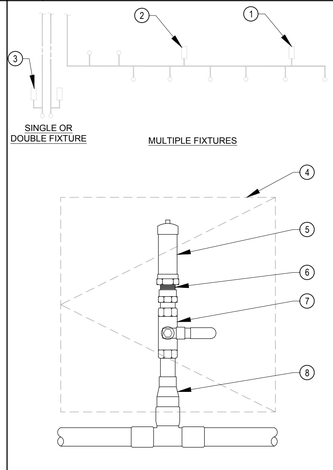
2 FLOOR DRAIN DETAIL



DETAIL NOTES:

1. EXHAUST FAN. FOR LOCATION, SEE PLANS.
2. FACTORY-SUPPLIED BRACKETS. SECURE BRACKET TO FAN W/ MANUFACTURER PROVIDED SCREWS. REFER TO AND FOLLOW MANUFACTURER INSTALLATION INSTRUCTIONS AND PROVIDE ALL NECESSARY HARDWARE.
3. DUCTWORK. CONNECT TO FAN WITH FLEX CONNECTOR. FOR SIZES, SEE FLOOR PLANS.
4. FACTORY GRILLE ATTACHED TO FAN HOUSING PER MANUFACTURES RECOMMENDED INSTALLATION INSTRUCTIONS.
5. CEILING ASSEMBLY. SEE ARCHITECT'S DRAWINGS.
6. FACTORY MOUNTING BRACKET ATTACHED TO 2x BLOCK W/ (4) - #10x2" WOOD SCREW, ONE AT EA CORNER.
7. 2x4 BLOCKING ATTACHED TO FRAMING W/ SIMPSON A35 EA SIDE & EA END.

9 CEILING EXHAUST FAN DETAIL N.T.S.



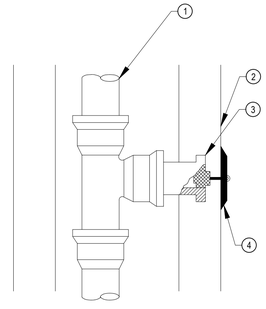
DETAIL NOTES:

1. INSTALL WATER HAMMER ARRESTOR JUST BEFORE LAST FIXTURE ON BRANCH LINE.
2. INSTALL AN ADDITIONAL WATER HAMMER ARRESTOR IF THE BRANCH LINE IS GREATER THAN 20' LONG.
3. INSTALL WATER HAMMER ARRESTOR ON ALL FIXTURES WITH QUICK CLOSING VALVES.
4. WALL ACCESS PANEL.
5. WATTS SERIES 15 OR EQUAL WATER HAMMER ARRESTOR. SIZE PER MANUFACTURER'S INSTRUCTIONS.
6. FITTING ADAPTER.
7. BALL VALVE. SIZE TO EQUAL WATER HAMMER ARRESTOR SIZE.
8. FITTING REDUCER (IF REQUIRED).

NOTES:

1. COMBINE SHUT-OFF VALVES, TRAP PRIMERS AND WATER HAMMER ARRESTORS BEHIND SINGLE WALL ACCESS PANEL WHERE POSSIBLE.

6 WATER HAMMER ARRESTOR DETAIL N.T.S.



DETAIL NOTES:

1. VENT, SOIL,WASTE OR LEADER STACK
2. WALL. FOR (E) WALLS, CUT & PATCH AS REQUIRED FOR INSTALLATION OF (N) CLEAN OUT.
3. WALL CLEANOUT
4. WALL PLATE AS SPECIFIED

3 WALL CLEANOUT DETAIL N.T.S.

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 01-122444 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 02/11/2026

Peartree+Belli
ARCHITECTS
235 MONTEREY ST., SUITE B
SALINAS, CA 93901
(831) 424-4620
PEARTREEBELLI.COM

CYPRESS Engineering Group
HVAC, Plumbing, Fire Protection
Building Commissioning
Energy Code Compliance
Energy & Technical Support
831.238.3900
8 Harris Court, Suite A9
Monterey, CA 93940
cypressengr.com

REGISTERED PROFESSIONAL ENGINEER
MEITIN SERTI LIN
No. M31059
EXP. JUNE 30, 2027
MECHANICAL
STATE OF CALIFORNIA

DETAILS - MECHANICAL & PLUMBING

TRACK + FIELD REPLACEMENT AND NEW RESTROOM BUILDING FOR:
CHUALAR UNION E.S.
24285 LINCOLN ST. CHUALAR, CA 93925
CHUALAR UNION SCHOOL DISTRICT

REV.	DATE	DESCRIPTION
	06/23/25	1ST PLAN CHECK SUBMITTAL
	10/24/25	1ST PLAN CHECK RE-SUBMITTAL

DATE: 05/15/2025
SCALE: AS NOTED
DRAWN:
JOB: 24033
SHEET: MP6.1

THE USE OF THESE PLANS AND SPECIFICATIONS SHALL BE RESTRICTED TO THE ORIGINAL SITE FOR WHICH THEY WERE PREPARED AND PUBLICATION THEREOF IS EXPRESSLY LIMITED TO SUCH USE. REUSE, REPRODUCTION, OR PUBLICATION BY ANY METHOD, IN WHOLE OR IN PART, IS PROHIBITED. TITLE TO THE PLANS AND SPECIFICATIONS REMAINS WITH THE ARCHITECT AND RESERVED RIGHTS OF COMMON LAW COPYRIGHT AND OTHER PROPERTY RIGHTS IN THESE INSTRUMENTS OF SERVICE SHALL NOT BE NEGATED OR RESTRICTED BY THE CONTRACT WITH THEM CONSTITUTES PRIMA FACIE EVIDENCE OF THE ACCEPTANCE OF THESE RESTRICTIONS

GENERAL CONSTRUCTION NOTES

1. CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE CODES AND REGULATIONS. MATERIALS AND EQUIPMENT SHALL BE U.L. LISTED AND LABELED FOR THE APPLICATION.
2. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS, LICENSES AND INSPECTION FEES REQUIRED BY THIS CONTRACT WORK.
3. CONTRACTOR SHALL VISIT THE PROJECT SITE PRIOR TO BIDDING AND ALLOW FOR ALL FIELD CONDITIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ELECTRICAL WORK NOTED AND CALLED OUT ON ALL CONTRACT DOCUMENTS. THE CONTRACTOR SHALL OBTAIN INFORMATION AND BE FAMILIAR WITH ALL OTHER TRADES WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION BETWEEN OTHER TRADES ON PROJECT.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF PERSONS AND PROPERTY AND SHALL PROVIDE INSURANCE COVERAGE AS NECESSARY FOR LIABILITY AND PERSONAL, PROPERTY DAMAGE, TO FULLY PROTECT THE OWNER, ARCHITECT AND ENGINEER FROM ANY AND ALL CLAIMS RESULTING FROM THIS WORK.
5. CONTRACTOR SHALL MAINTAIN RECORD DRAWINGS AT THE PROJECT SITE INDICATING ALL MODIFICATIONS TO ELECTRICAL SYSTEMS. THE CONTRACTOR SHALL AT THE CONCLUSION OF THE PROJECT PROVIDE ACCURATE "AS-BUILT" DRAWINGS ACCEPTABLE TO THE ARCHITECT.
6. ALL MATERIALS PROVIDED TO THE PROJECT SHALL BE NEW. THE CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE AND INSTALL ALL INCIDENTAL MATERIALS REQUIRED FOR A COMPLETE INSTALLATION.
7. CONTRACTOR SHALL PROVIDE TO THE ARCHITECT A CONSTRUCTION SCHEDULE OF ELECTRICAL WORK. THE CONSTRUCTION SCHEDULE SHALL IDENTIFY ALL SIGNIFICANT MILESTONES WITH COMPLETION DATES.
8. CONTRACTOR SHALL PROVIDE ALL REQUIRED "CUTTING, PATCHING, EXCAVATION, BACKFILL AND REPAIRS" NECESSARY TO RESTORE DAMAGED SURFACES TO EQUAL OR BETTER THAN ORIGINAL CONDITIONS EXISTING AT START OF WORK.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR PAINTING ALL EXPOSED CONDUITS AND ELECTRICAL EQUIPMENT. REFER TO ARCHITECTS PAINTING SECTION FOR REQUIREMENTS.
10. ALL ELECTRICAL EQUIPMENT INSTALLED OUTDOORS SHALL BE WEATHERPROOF. EXTERIOR CONDUITS RUN INTO BUILDINGS SHALL BE INSTALLED WITH FLASHING, CAULKED AND SEALED. CONDUITS FOR EXTERIOR ELECTRICAL DEVICES SHALL BE RUN INSIDE BUILDING UNLESS OTHERWISE NOTED ON DRAWINGS.
11. ALL CONDUITS UNLESS OTHERWISE NOTED ON DRAWINGS SHALL HAVE AS A MINIMUM: TWO (2) #12s WITH ONE (1) #12 GROUND. "TICK" MARKS SHOWN ON CIRCUITRY ARE FOR ROUGH ESTIMATING ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WIRES AND WIRE SIZES REQUIRED BY LATEST CODE.
12. ALL BRANCH CIRCUITS SHALL HAVE INDIVIDUAL NEUTRALS. SHARED NEUTRALS ON MULTIWIRE CIRCUITS IS NOT ALLOWED.
13. ALL 120/277V LIGHT SWITCHES AND WALL OCCUPANT SENSORS SHALL HAVE A NEUTRAL INSTALLED TO THE DEVICE BOX EXCEPT WHERE A CONDUIT OR SURFACE RACEWAY SYSTEM IS INSTALLED.
14. COORDINATE ALL CONDUIT RUNS, ELECTRICAL EQUIPMENT AND PANELS WITH ALL OTHER WORK TO AVOID CONFLICTS.
15. SEE ARCHITECTURAL DOCUMENTS FOR EXACT PLACEMENT OF LIGHTING FIXTURES AND DEVICES. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF CEILING TYPES FROM ARCHITECTURAL DOCUMENTS AND PROVIDE AND INSTALL ALL REQUIRED FIXTURE MOUNTING HARDWARE. PROVIDE AND INSTALL U.L. LISTED FIRE STOP ENCLOSURES FOR ALL RECESSED FIXTURES IN FIRE RATED CEILINGS.
16. FROM ALL NEW FLUSH MOUNT PANELS; THE CONTRACTOR SHALL STUB UP INTO ACCESSIBLE CEILING SPACE A MINIMUM OF FOUR (4) 3/4" CONDUITS FOR FUTURE USE.
17. CONTRACTOR SHALL, PRIOR TO BID, FIELD VERIFY ALL REQUIREMENTS FOR MODIFYING THE EXISTING CLOCK, DATA, AND INTERCOM SYSTEMS TO ACCOMMODATE ADDITIONS NOTED. THE CONTRACTOR SHALL PROVIDE ALL MATERIALS NEEDED TO MAKE A FULLY OPERATIONAL SYSTEM AT THE CONCLUSION OF PROJECT WORK.
18. CONTRACTOR SHALL PROVIDE IN EVERY NEW EMPTY CONDUIT A DRAW STRING FOR USE IN FUTURE CONSTRUCTION.
19. ALL CONDUIT SHALL BE CONCEALED WHERE POSSIBLE. CUT AND PATCH EXISTING WALLS WHERE NECESSARY. WHERE IT IS NECESSARY TO CUT OR BORE EXISTING STRUCTURAL WALLS FOR NEW ELECTRICAL WORK OBTAIN PERMISSION FROM THE ARCHITECT PRIOR TO STARTING WORK. REUSE EXISTING CONDUIT WHERE POSSIBLE.
20. WHERE IT IS NOT POSSIBLE TO REUSE EXISTING CONDUIT OR RUN NEW CONCEALED CONDUIT USE NON-METALLIC SURFACE RACEWAY AND BOXES. ROUTING OF ALL NON-METALLIC RACEWAYS SHALL BE APPROVED BY THE ARCHITECT OR OWNER'S REPRESENTATIVE PRIOR TO ROUGH-IN.
21. EXTENSION RINGS OR RESET BOXES TO BE FLUSH WITH NEW WALL THICKNESS.
22. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DAMAGE TO EXISTING UNDERGROUND SYSTEMS (GAS, WATER, TELEPHONE, ELECTRICAL, SEWER, ETC.). THE CONTRACTOR SHALL REPAIR & PAY ALL EXPENSES FOR DAMAGE TO EXISTING UNDERGROUND SYSTEMS AS A RESULT OF NEW WORK. REPAIR TO DAMAGED UNDERGROUND SYSTEMS SHALL BE TO THE OWNERS SATISFACTION WITHOUT EXTRA EXPENSE TO THE OWNER.
23. EXISTING WIRING SHOWN HAS BEEN TAKEN FROM OLD PLANS AND IS ASSUMED TO BE CORRECT. ELECTRICAL CONTRACTOR SHALL FIELD VERIFY ACTUAL CONDITIONS AND MAKE ADJUSTMENTS TO SUIT ACTUAL CONDITIONS AND TO MEET THE INTENT OF THE CONTRACT DOCUMENTS.
24. WHERE NON-METALLIC SHEATHED CONDUCTORS ARE FOUND, THE CONTRACTOR SHALL REMOVE TO FULLEST EXTENT PER THE GENERAL DEMOLITION NOTES AND REPLACE WITH CONDUIT. METAL CLAD CABLE WILL BE PERMITTED ON A CASE-BY-CASE BASIS ONLY BY WRITTEN APPROVAL FROM THE ARCHITECT.
25. ALL INSTALLATION OF EXPOSED SURFACE MOUNTED RACEWAY IN PUBLIC AREAS SHALL BE REVIEWED BY ARCHITECT BEFORE ROUGH-IN. CONTRACTOR IS TO DETERMINE THE ACCESSIBILITY OF ATTIC, FURRED SPACE, HOLLOW MULLIONS, ETC. IN EACH AREA AND REVIEW WITH ARCHITECT. IF SYSTEM CAN BE ROUTED CONCEALED EITHER BY FISHING OR ACCESSIBILITY, CONTRACTOR IS TO DO SO. IF INACCESSIBILITY IS DETERMINED, CONTRACTOR SHALL INSTALL SURFACE MOUNTED RACEWAY IN THE MOST AESTHETICALLY PLEASING MEANS AS DETERMINED BY THE ARCHITECT. NO ALLOWANCE FOR ADDITIONAL COMPENSATION DUE TO ROUTING AS DIRECTED BY THE ARCHITECT WILL BE MADE.

ELECTRICAL SYMBOLS & ABBREVIATIONS

SYMBOLS & ABBREVIATIONS SHOWN ARE FOR GENERAL USE. DISREGARD THOSE WHICH DO NOT APPEAR ON THE PLANS.

- FLUORESCENT OR LED LUMINAIRE - SEE SCHEDULE
- EMERGENCY OR NIGHT LIGHT
- STRIP FLUORESCENT OR LED LUMINAIRE - SEE SCHEDULE
- LUMINAIRE - RECESSED - SEE SCHEDULE
- RECESSED WALL WASHER
- LUMINAIRE - SURFACE MOUNTED - SEE SCHEDULE
- LUMINAIRE - POLE OR POST MOUNTED - SEE SCHEDULE
- LUMINAIRE - WALL MOUNTED SEE SCHEDULE
- BOLLARD OR PATH LIGHT - SEE SCHEDULE
- EXIT LIGHT - DIRECTIONAL ARROWS AS INDICATED - SEE SCHEDULE
- TRACK LIGHTING - SEE SCHEDULE
- EMERGENCY LIGHT
- DIGITAL DUAL TECHNOLOGY OCC. SENSOR
- LIGHTING CONTROL OCCUPANCY SENSOR CORNER MOUNTED
- DRC — DIMMER ROOM CONTROLLER
- PC — PLUG LOAD CONTROLLER
- RC — ROOM LIGHTING CONTROLLER
- LCP — LIGHTING CONTROL PANEL
- DL — DIGITAL DAYLIGHT SENSOR
- SINGLE POLE SWITCH ★★
- $a — SINGLE POLE SWITCH, ★★ a = CIRCUIT CONTROLLED
- $3 — THREE WAY SWITCH★★
- $4 — FOUR WAY SWITCH★★
- $M — MANUAL MOTOR STARTER
- $K — KEY OPERATED SWITCH★★
- $ — LIGHTING DIMMER★★
- $ — DIGITAL ON/OFF SWITCH ★★
- $D — DIGITAL DIMMER SWITCH ★★
- $M# — DIGITAL MULTI SCENE LIGHTING SWITCH ★★
- $S — DIGITAL DUAL TECHNOLOGY WALL OCC. SENSOR ★★
- WALL OCCUPANCY SENSOR ★★
- $2 — DOUBLE SWITCHED WALL OCCUPANCY SENSOR ★★
- DIMMING DUAL TECHNOLOGY WALL SWITCH OCCUPANCY SENSOR ★★
- $2 — 2-BUTTON DIMMING DUAL TECHNOLOGY WALL SWITCH OCCUPANCY SENSOR ★★

- SECURITY DOOR CONTACTS
- MD — SECURITY MOTION DETECTOR
- SC — CCTV CAMERA
- KP — SECURITY SYSTEM KEYPAD
- DOOR BELL PUSHBUTTON
- DOOR CHIME WITH LED
- RECEPTACLE - DUPLEX★
- DUPLEX RECEPTACLE MOUNTED ABOVE COUNTER - FIELD VERIFY HEIGHT
- GFCI CONVENIENCE RECEPTACLE - DUPLEX★
- GFCI CONVENIENCE DUPLEX RECEPTACLE MOUNTED ABOVE COUNTER - FIELD VERIFY HEIGHT
- RECEPTACLE DOUBLE DUPLEX★
- HALF SWITCHED DUPLEX RECEPTACLE ★
- SINGLE RECEPTACLE★
- DUPLEX RECEPTACLE - CEILING MOUNTED
- HC — LETTER INDICATES DUPLEX HALF CONTROLLED RECEPTACLE ★
- C — LETTER INDICATES DUPLEX FULLY CONTROLLED RECEPTACLE ★
- FLOOR MOUNTED DUPLEX RECEPTACLE
- FLOOR MOUNTED BOX
- POWER OUTLET - SEE PLANS FOR NEMA TYPE★
- POWER POLE
- WALL TELEPHONE OUTLET ★★
- [#] — VOICE/DATA WALL OUTLET ★
- [#] — VOICE/DATA OUTLET MOUNTED ABOVE COUNTER - FIELD VERIFY HEIGHT
- [#] — SURFACE MOUNTED VOICE/DATA WALL OUTLET ★
- [#] — SURFACE MOUNTED VOICE/DATA OUTLET MOUNTED ABOVE COUNTER - FIELD VERIFY HEIGHT
- WIRELESS ACCESS POINT (WAP) - CEILING MOUNTED
- WIRELESS ACCESS POINT (WAP) - WALL MOUNTED - FIELD VERIFY HEIGHT
- [#] — VOICE/DATA OUTLET - FLOOR MOUNTED
- TV OUTLET ★
- [#] — VOICE/DATA OUTLET - CEILING MOUNTED
- S — INTERIOR SPEAKERS CEILING MOUNTED
- HS — INTERIOR SPEAKERS WALL MOUNTED
- HC — CLOCK +8'-0" AFF U.O.N. VERIFY BEFORE INSTALLATION

- PANELBOARD - FLUSH MOUNTED
- EQUIPMENT PANEL - FLUSH MOUNTED
- PANELBOARD - SURFACE MOUNTED
- EQUIPMENT PANEL - SURFACE MOUNTED
- M — METER W/ CURRENT TRANSFORMER
- J — JUNCTION BOX - CEILING OR WALL MOUNTED, SIZE PER CODE, TAPE AND TAG WIRES
- MOTOR CONNECTION
- NON-FUSED DISCONNECT SWITCH
- FUSED DISCONNECT SWITCH; FUSED WITH DUAL-ELEMENT FUSES SIZED PER EQUIPMENT MFGR'S NAMEPLATE DATA
- COMBINATION STARTER/FUSED DISCONNECT SWITCH; FUSED DISCONNECT SWITCH ELEMENT FUSES SIZED PER EQUIPMENT MFGRS NAMEPLATE DATA
- MAGNETIC STARTER - NEMA SIZE INDICATED NEMA 3R ENCLOSURE UNLESS OTHERWISE SPECIFIED
- CIRCUIT BREAKER
- GROUND ROD WITH GROUNDWELL BOX
- GROUND ELECTRODE
- NORMALLY OPEN CONTACT
- NORMALLY CLOSED CONTACT
- TRANSFORMER - SEE SINGLE LINE FOR SIZE
- PULLBOX
- ERMS
- FLEX CONDUIT WITH CONNECTION
- CONDUIT - UP
- CONDUIT - DOWN
- E — CONDUIT EMERGENCY SYSTEM
- LV — LOW VOLTAGE WIRING
- SURFACE METAL OR NON-METALLIC RACEWAY
- CONDUIT - CONCEALED IN WALLS OR CEILING
- CONDUIT - EXISTING
- CONDUIT - BELOW SLAB OR UNDERGROUND: 3/4"MIN.
- CAPPED OR STUB-OUT CONDUIT
- CONDUIT CONTINUATION
- #10 — CONDUIT - HOME RUN TO PANEL, TERMINAL CABINET, ETC. RUNS MARKED WITH CROSSHATCHES INDICATE NUMBER OF #12 AWG WIRES WHEN MORE THAN TWO. SIZE CONDUIT ACCORDING TO SPECIFICATIONS AND APPLICABLE CODE. CROSS HATCHES WITH NUMBER ADJACENT INDICATES WIRE SIZE OTHER THAN #12 AWG.
- 2 — SHEET NOTE REFERENCE SYMBOL; SEE ASSOCIATED NOTE ON SAME SHEET
- 3 — SCHEDULE SYMBOL; SEE ASSOCIATED NOTE ON SAME SHEET

- X — DETAIL NOTE REFERENCE SYMBOL SEE ASSOCIATED NOTE ON SAME DETAIL
- FXXX — FEEDER DESIGNATION; SEE ASSOCIATED NOTE ON SAME DETAIL
- X / X.XX — DETAIL NUMBER; DETAIL OR SECTION REFERENCE; SHEET NUMBER
- X / X — INDICATES QUANTITY OF TELEPHONE OUTLETS; INDICATES QUANTITY OF DATA OUTLETS

ABBREVIATIONS

A	AMPERE	GFCI	GROUND FAULT INTERRUPTING	NTS	NOT TO SCALE
AFF	ABOVE FINISHED FLOOR	GFI	GROUND	OAH	OVERALL HEIGHT
ALUM/AL	ALUMINUM	GND, G	GALVANIZED RIGID STEEL	OC	ON CENTER
ARCH	ARCHITECT	GRS	HEIGHT	OH	OVERHEAD
AWG	AMERICAN WIRE GAUGE	HT	INTERCOM	OFCI	OWNER FURNACED CONTRACTOR INSTALLED
BKR	BREAKER	IC	INTERMEDIATE DISTRIBUTION FRAME	PA	PUBLIC ADDRESS
C	CONDUIT	IDF	INCANDESCENT	PB	PULL BOX
CATV	CABLE TV	INCAND	JUNCTION BOX	PF	POWER FACTOR
CB	CIRCUIT BREAKER	JB	KILOVOLT	PH	PHASE
CCTV	CLOSED CIRCUIT TV	KV	KILOVOLT AMPERES	PIR	PASSIVE INFRARED
CKT	CIRCUIT	KVA	KILOWATT	PNL	PANEL
CL	CENTER LINE	KW	LIGHTING CONTROL PANEL	PV	PHOTOVOLTAIC
CLG	CEILING	LCP	LIGHTING	PVC	POLYVINYL CHLORIDE
C.O.	CONDUIT ONLY	LTG	LOW VOLTAGE	PWR	POWER
CTR	CENTER	LV	THOUSAND CIRCULAR MILS	(R)	RELOCATE
D	DIMMER	KCM	MAIN CIRCUIT BREAKER	(RP)	REMOVABLE POLE
DIM	DIMENSION	M.B.	MINIMUM CIRCUIT AMPS	RECPT'S	RECEPTACLES
DIST	DISTRIBUTION	MCA	MAIN DISTRIBUTION FRAME	REQD	REQUIRED
(E)	EXISTING	MDF	MECHANICAL	REQMT'S	REQUIREMENT(S)
EC	ELECTRICAL CONTRACTOR	MECH	METAL HALIDE	SHT	SHEET
(EL)	EVENING LIGHT	MH	MAIN LUGS ONLY	SLD	SINGLE LINE DIAGRAM
EM	EMERGENCY	MLO	MAIN POINT OF ENTRANCE	STC	SYSTEMS TERMINATION CABINET
EMT	ELECTRICAL METALLIC TUBING	MPOE	MOUNTED	SW	SWITCH
ERMS	ENERGY REDUCTION MAINTENANCE SWITCH	MTD	MOUNTING	SWBD	SWITCHBOARD
EQUIP	EQUIPMENT	MTG	MAXIMUM OVER CURRENT PROTECTION	TTB	TELEPHONE TERMINAL BACKBOARD
EV	ELECTRICAL VEHICLE	MOCP	NEW	TYP	TYPICAL
FA	FIRE ALARM	(N)	NOT IN CONTRACT	UON	UNLESS OTHERWISE NOTED
FACP	FIRE ALARM CONTROL PANEL	NIC	NOT IN ELECTRICAL CONTRACT	UG	UNDERGROUND
FC	FOOT CANDLE	NIEC	NIGHT LIGHT	V	VOLT
FIN	FINISH	(NL)	NUMBER	VD	VOLTAGE DROP
FL	FLOOR	NO.	NOMINAL	W	WATT
FLA	FULL LOAD AMPS	NOM		WP	WEATHERPROOF
FLUOR	FLUORESCENT			XFMR	TRANSFORMER
(F)	FUTURE				
GC	GENERAL CONTRACTOR				

FIRE ALARM

NOTE: SEE FIRE ALARM DRAWINGS FOR QUANTITIES AND MOUNTING HEIGHTS.

- P — MANUAL PULL STATION
- STROBE ONLY
- HORN ONLY
- M — MINI HORN
- HORN/STROBE
- CHIME/STROBE
- HEAT DETECTOR
- SMOKE DETECTOR
- CO — CARBON MONOXIDE ALARM
- DUCT SMOKE DETECTOR
- TAMPER SWITCH
- FLOW SWITCH
- POST INDICATING VALVE
- FIRE SMOKE DAMPER
- BELL (GONG)
- FCP — FIRE ALARM CONTROL PANEL
- DH — DOOR HOLDER
- APS — AUXILIARY POWER SUPPLY
- FSA — FIRE SYSTEM ANNUNCIATOR
- FTR — FIRE ALARM TRANSPONDER OR TRANSMITTER
- ESR — ELEVATOR STATUS/RECALL
- FAC — FIRE ALARM COMMUNICATOR
- ANN — REMOTE ANNUNCIATORS
- EOL — END OF LINE

★ +15" A.F.F. TO BOTTOM OF BOX, U.O.N.
★★ +48" A.F.F. TO TOP OF BOX, U.O.N.

[#] NUMBER IN BRACKETS DENOTES NUMBER OF CABLE DROPS WHEN MORE THAN (2).

EQUIPMENT ANCHORAGE

M/E/P COMPONENT ANCHORAGE NOTES:

ALL MECHANICAL, PLUMBING, AND ELECTRICAL COMPONENTS SHALL BE ANCHORED AND INSTALLED PER THE DETAILS ON THE DSA-APPROVED CONSTRUCTION DOCUMENTS. THE FOLLOWING COMPONENTS SHALL BE ANCHORED OR BRACED TO MEET THE FORCE AND DISPLACEMENT REQUIREMENTS PRESCRIBED IN THE 2022 CBC SECTIONS 1617A.1.18 THROUGH 1617A.1.26 AND ASCE 7-16 CHAPTERS 13, 26, AND 30:

1. ALL PERMANENT EQUIPMENT AND COMPONENTS.
2. TEMPORARY, MOVABLE OR MOBILE EQUIPMENT THAT IS PERMANENTLY ATTACHED (e.g. HARD WIRED) TO THE BUILDING UTILITY SERVICES SUCH AS ELECTRICITY, GAS OR WATER. "PERMANENTLY ATTACHED" SHALL INCLUDE ALL ELECTRICAL CONNECTIONS EXCEPT PLUGS FOR 110 / 220 VOLT RECEPTACLES HAVING A FLEXIBLE CABLE.
3. TEMPORARY, MOVABLE OR MOBILE EQUIPMENT WHICH IS HEAVIER THAN 400 POUNDS OR HAS A CENTER OF MASS LOCATED 4 FEET OR MORE ABOVE THE ADJACENT FLOOR OR ROOF LEVEL THAT DIRECTLY SUPPORT THE COMPONENT IS REQUIRED TO BE RESTRAINED IN A MANNER APPROVED BY DSA.

THE FOLLOWING MECHANICAL AND ELECTRICAL COMPONENTS SHALL BE POSITIVELY ATTACHED TO THE STRUCTURE, BUT NEED NOT BE DETAILED IN THE PLANS. THESE COMPONENTS SHALL HAVE FLEXIBLE CONNECTIONS PROVIDED BETWEEN THE COMPONENT AND ASSOCIATED DUCTWORK, PIPING AND CONDUIT. FLEXIBLE CONNECTIONS MUST ALLOW MOVEMENT IN BOTH TRANSVERSE AND LONGITUDINAL DIRECTIONS.

A. COMPONENTS WEIGHTING LESS THAN 400 POUNDS AND HAVE A CENTER OF MASS LOCATED 4 FEET OR LESS ABOVE THE ADJACENT FLOOR OR ROOF LEVEL THAT DIRECTLY SUPPORT THE COMPONENT.

B. COMPONENTS WEIGHTING LESS THAN 20 POUNDS, OR IN THE CASE OF DISTRIBUTED SYSTEMS, LESS THAN 5 POUNDS PER FOOT, WHICH ARE SUSPENDED FROM A ROOF OR FLOOR OR HUNG FROM A WALL.

THE ANCHORAGE OF ALL MECHANICAL, ELECTRICAL AND PLUMBING COMPONENTS SHALL BE SUBJECT OF THE APPROVAL OF THE DESIGN PROFESSIONAL IN GENERAL RESPONSIBLE CHARGE OR STRUCTURAL ENGINEER DELEGATED RESPONSIBILITY AND ACCEPTANCE BY DSA. THE PROJECT INSPECTOR WILL VERIFY THAT ALL COMPONENTS AND EQUIPMENT HAVE BEEN ANCHORED IN ACCORDANCE WITH ABOVE REQUIREMENTS.

MEP DISTRIBUTION SYSTEM BRACING NOTE FOR PIPING, DUCTWORK, AND ELECTRICAL CONDUIT

PIPING, DUCTWORK AND ELECTRICAL DISTRIBUTION SYSTEMS SHALL BE BRACED TO COMPLY WITH THE FORCES AND DISPLACEMENTS PRESCRIBED IN ASCE 7 SECTION 13.3 AS DEFINED IN ASCE 7 SECTION 13.6.5, 13.6.6, 13.6.7, 13.6.8 AND 2022 CBC SECTIONS 1617A.1.24, 1617A.1.25 AND 1617A.1.26.

THE METHOD OF SHOWING BRACING AND ATTACHMENTS TO THE STRUCTURE FOR THE IDENTIFIED DISTRIBUTION SYSTEM ARE AS NOTED BELOW. THE MEP DESIGN PROFESSIONAL ENGINEER RESPONSIBLE FOR CONTENT ON THESE SHEETS HAS VERIFIED THAT THE DESIGN METHODS IDENTIFIED BELOW ARE IN ACCORDANCE WITH DSA IR 16-13.

MECHANICAL PIPING (MP), MECHANICAL DUCTS (MD), PLUMBING PIPING (PP), ELECTRICAL DISTRIBUTION SYSTEMS (E):

MP ☐ MD ☐ PP ☐ E ■ - OPTION 1: PROJECT-SPECIFIC DESIGN.

MP ☐ MD ☐ PP ☐ E ☐ - OPTION 2: DESIGN BASED ON OSHPOD OPM, WITHIN PROJECT SUBMITTAL.

MP ☐ MD ☐ PP ☐ E ☐ - OPTION 3: DESIGN BASED ON OSHPOD OPM, DEFERRED SUBMITTAL.

APPLICABLE CODES & STANDARDS

CODES:

1. 2025 CALIFORNIA ADMINISTRATIVE CODE C.A.C., PART 1, TITLE 24, C.C.R.
2. 2022 CALIFORNIA BUILDING CODE (CBC) C.C.R., TITLE 24, VOL. 1 & 2 BASED ON THE 2021 INTERNATIONAL BUILDING CODE (IBC) WITH CALIFORNIA AMENDMENTS.
3. 2022 CALIFORNIA ELECTRICAL CODE (CEC) C.C.R., TITLE 24, PART 3 BASED ON THE 2020 NATIONAL ELECTRICAL CODE (NEC) WITH CALIFORNIA AMENDMENTS.
4. 2022 CALIFORNIA MECHANICAL CODE (CMC) C.C.R., TITLE 24, PART 4 BASED ON THE 2021 UNIFORM MECHANICAL CODE (UMC) WITH CALIFORNIA AMENDMENTS.
5. 2022 CALIFORNIA PLUMBING CODE (CPC) C.C.R., TITLE 24, PART 5 BASED ON THE 2021 UNIFORM PLUMBING CODE (UPC) WITH CALIFORNIA AMENDMENTS.
6. 2022 CALIFORNIA ENERGY CODE C.C.R., TITLE 24, PART 6.
7. 2022 CALIFORNIA FIRE CODE (CFC) C.C.R., TITLE 24, PART 9 BASED ON THE 2021 INTERNATIONAL FIRE CODE (IFC) WITH CALIFORNIA AMENDMENTS.
8. 2022 CALIFORNIA GREEN BUILDING STANDARDS CODE C.C.R., TITLE 24, PART 11.
9. 2022 CALIFORNIA REFERENCED STANDARDS CODE C.C.R., TITLE 24, PART 12.
10. TITLE 19 C.C.R., PUBLIC SAFETY, STATE FIRE MARSHAL REGULATIONS.
11. NATIONAL FIRE ALARM CODE (NFPA 72) 2022.

STANDARDS:

1. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
2. ELECTRONICS INDUSTRIES ASSOCIATION (EIA)
3. INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS (IEEE)
4. NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)
5. NATIONAL ELECTRICAL TESTING ASSOCIATION (NETA)
6. UNDERWRITER LABORATORIES (UL)
7. CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH ACT STANDARDS (CAL/OSHA)

SHEET INDEX

E0.1	SYMBOLS, ABBREVIATIONS, GENERAL CONSTRUCTION NOTES, LIGHT FIXTURE SCHEDULE, CODES & SHEET INDEX.
E0.2	CALIFORNIA ENERGY COMPLIANCE TITLE 24 (BUILDING INTERIOR).
E0.3	CALIFORNIA ENERGY COMPLIANCE TITLE 24 (BUILDING EXTERIOR).
E1.1	ELECTRICAL SINGLE LINE DIAGRAM & PANELBOARD SCHEDULES.
E2.1	ELECTRICAL SITE PLAN.
E4.1	POWER, SYSTEMS & LIGHTING PLAN.
E6.1	ELECTRICAL DETAILS.
FA0.1	FIRE ALARM SYMBOLS, ABBREVIATIONS, EQUIPMENT LIST, OPERATIONAL MATRIX, DETAILS & NOTES.
FA1.1	FIRE ALARM RISER DIAGRAM, BATTERY & VOLTAGE DROP CALCULATIONS.
FA2.1	FIRE ALARM SITE PLAN.
FA4.1	FIRE ALARM PLAN.

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 01-122444 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 02/11/2026

Peartree+Belli
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PEARTREEBELLI.COM

Acelar Consulting
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Monterey Bay, Inc.
Project No. 24-290.00
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The drawings, specifications and ideas, designs, arrangements and plans indicated or represented by these drawings are and shall remain the property of the Architect and the Architect shall retain all common law, statutory and other reserved rights, including the copyright thereto. No part of these drawings shall be copied, disclosed to others or used in connection with any work or project other than the specific project for which they have been prepared and developed without the written consent of the Architect. Visual contact with these drawings shall constitute prima facie evidence of the acceptance of these restrictions.

REGISTERED PROFESSIONAL ENGINEER
JULIE B. ANWARY
No. E21043
EXP. 3/31/27
ELECTRICAL
STATE OF CALIFORNIA

SYMBOLS, ABBREV., CODES, STANDARDS, NOTES & SHEET INDEX

TRACK + FIELD REPLACEMENT AND NEW RESTROOM BUILDING FOR:

CHUALAR UNION E.S.

24285 LINCOLN ST. CHUALAR, CA 93925

CHUALAR UNION SCHOOL DISTRICT

REV.	DATE	DESCRIPTION
	06/23/25	1ST PLAN CHECK SUBMITTAL
	10/24/25	1ST PLAN CHECK RE-SUBMITTAL
	01/21/26	2ND BACK CHECK RE-SUBMITTAL

DATE: 05/15/2025
SCALE: AS NOTED
DRAWN:
JOB: 24033
SHEET: E0.1

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STATE OF CALIFORNIA
Indoor Lighting
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-LTI-E
This document is used to demonstrate compliance with requirements in 110.9, 110.12(c), 130.0, 130.1, 140.6 and 141.0(b)2 for indoor lighting scopes using the prescriptive path for nonresidential and hotel/motel occupancies. It is also used to document compliance with requirements in 160.5, 170.2(e) and 180.2(b)4 for indoor lighting scopes using the prescriptive path for multifamily occupancies. Multifamily includes dormitory and senior living facilities.	
Project Name: Chualar Elementary School Restroom Modernization	**Report Page:** (Page 1 of 7)
Project Address: 24285 Lincoln St., Chualar, CA 93925	**Date Prepared:** 2025-04-21T12:51:22-04:00

A. GENERAL INFORMATION

01	Project Location (city)	Chualar	04	Total Conditioned Floor Area (ft²)	164
02	Climate Zone	3	05	Total Unconditioned Floor Area (ft²)	0
03	Occupancy Types Within Project (select all that apply):		06	# of Stories (Habitable Above Grade)	0
● School or Classroom					

B. PROJECT SCOPE

This table includes any lighting systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in 140.6 / 170.2(e) or 141.0(b)2 / 180.2(b)4 for alterations.

Scope of Work	Conditioned Spaces		Unconditioned Spaces	
01	02	03	04	05
My Project Consists of (check all that apply):	Calculation Method	Area (ft²)	Calculation Method	Area (ft²)
☒ New Lighting System	Area Category Method	164	N/A	0
☐ New Lighting System - Parking Garage	N/A	0	N/A	0
Total Area of Work (ft²)	164			

STATE OF CALIFORNIA
Indoor Lighting
CALIFORNIA ENERGY COMMISSION
CERTIFICATE OF COMPLIANCE NRCC-LTI-E
Project Name: Chualar Elementary School Restroom Modernization

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C. COMPLIANCE RESULTS

If any cell on this table says "DOES NOT COMPLY" or "COMPLIES with Exceptional Conditions" refer to Table D. for guidance.

Lighting in conditioned and unconditioned spaces must not be combined for compliance per 140.6(b)1 / 170.2(e)	Allowed Lighting Power per 140.6(b) / 170.2(e) (Watts)						Adjusted Lighting Power per 140.6(a) / 170.2(e) (Watts)				Compliance Results
	01	02	03	04	05		06	07	08		09
	Complete Building 140.6(c)1	Area Category 140.6(c)2 / 170.2(e)4	Area Category Additional 140.6(c)2G / 170.2(e)4Av (+)	Tailored 140.6(c)3 / 170.2(e)4B (+)			Total Designed (Watts)	Adjustments: PAF Lighting Control Credits 140.6(a)2 / 170.2(e)1B (-)	Total Adjusted (Watts) *Includes Adjustments		05 must be >= 08 140.6 / 170.2(e)
	(See Table I)	(See Table I)	(See Table J)	(See Table K)	=	**Total Allowed** (Watts)	≥ (See Table F)	(See Table P)	=		
Conditioned		94.15			=	94.15	≥ 78.2		=	78.2	COMPLIES
Unconditioned					=		≥		=		
Controls Compliance (See Table H for Details)											COMPLIES
Rated Power Reduction Compliance (See Table Q for Details)											

D. EXCEPTIONAL CONDITIONS

This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.

E. ADDITIONAL REMARKS

This table includes remarks made by the permit applicant to the Authority Having Jurisdiction.

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STATE OF CALIFORNIA
Indoor Lighting
CALIFORNIA ENERGY COMMISSION
CERTIFICATE OF COMPLIANCE NRCC-LTI-E
Project Name: Chualar Elementary School Restroom Modernization

Report Page: (Page 3 of 7)

Date Prepared: 2025-04-21T12:51:22-04:00

F. INDOOR LIGHTING FIXTURE SCHEDULE

This table includes all planned permanent and portable lighting other than dwelling unit/ hotel/ motel room lighting. Multifamily dwelling unit and hotel/motel room lighting is documented in Table T. If using Table T to document lighting in multifamily common use areas providing shared provisions for living, eating, cooking or sanitation, those luminaires are not included here.

Designed Wattage: Conditioned Spaces

01	02	03	04	05	06	07	08	09	10	
									Field Inspector	
Name or Item Tag	Complete Luminaire Description	Modular (Track) Fixture	Small Aperture & Color Change[1]	Watts per luminaire[2]	How is Wattage determined	Total Number of Luminaires	Excluded per 140.6(a)3 / 170.2(e)2C	Design Watts	Pass	Fail
A	11"W x 4'L Vandal-Resistant Surface Mounted LED	No	NA	31	Mfr. Spec	2	No	62	☐	☐
B	2 3/4"W x 4'L Surface Mounted LED	No	NA	16.2	Mfr. Spec	1	No	16.2	☐	☐
							Total Designed Watts: CONDITIONED SPACES	78.2		

[1] *FOOTNOTE: Design Watts for small aperture and color changing luminaires which qualify per 140.6(a)4B / 170.2(e)2D is adjusted to be 75% /80% of their rated wattage. Table F automatically makes this adjustment, the permit applicant should enter full rated wattage in column 05.*

[2] *Authority Having Jurisdiction may ask for Luminaire cut sheets to confirm wattage used for compliance per 130.0(c) / 160.5(b). Wattage used must be the maximum rated for the luminaire, not the lamp.*

G. MODULAR LIGHTING SYSTEMS

This section does not apply to this project.

H. INDOOR LIGHTING CONTROLS (Not including PAFs)

This table includes lighting controls for conditioned and unconditioned spaces.

Building Level Controls

01	02	03	
		Field Inspector	
Mandatory Demand Response 110.12(c)	Shut-off controls 130.1(c) / 160.5(b)4C	Pass	Fail
NA < 4,000W subject to multilevel	See Area/Space Level Controls	☐	☐

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STATE OF CALIFORNIA
Indoor Lighting
CALIFORNIA ENERGY COMMISSION
CERTIFICATE OF COMPLIANCE NRCC-LTI-E
Project Name: Chualar Elementary School Restroom Modernization

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H. INDOOR LIGHTING CONTROLS (Not including PAFs)

Area Level Controls

04	05	06	07	08	09	10	11	12	
								Field Inspector	
Area Description	Complete Building or Area Category Primary Function Area	Manual Area Controls 130.1(a) / 160.5(b)4A	Multi-Level Controls 130.1(b) / 160.5(b)4B	Shut-Off Controls 130.1(c) // 160.5(b)4C	Primary/Skylit Daylighting 130.1(d) / 160.5(b)4D	Secondary Daylighting 130.1(d) / 160.5(b)4D	Interlocked Systems 140.6(a)1/ 170.2(e)2A	Pass	Fail
Restroom 1	Restroom	Readily Accessible	NA: Restrooms	Occupancy Sensor	NA: Not daylit zone	NA: Not daylit zone	No	☐	☐
Restroom 2	Restroom	Readily Accessible	NA: Restrooms	Occupancy Sensor	NA: Not daylit zone	NA: Not daylit zone	No	☐	☐
Restroom Storage	Storage - MF common areas	Readily Accessible	NA: Enclosed area <100SF	See Building Level	NA: Not daylit zone	NA: Not daylit zone	No	☐	☐
					13				
					Plan Sheet Showing Daylit Zones:				

I. LIGHTING POWER ALLOWANCE: COMPLETE BUILDING OR AREA CATEGORY METHODS

Each area complying using the Complete Building or Area Category Methods per 140.6(b) are included in this table. Column 06 indicates if additional lighting power allowances per 140.6(c) or adjustments per 140.6(a) are being used .

Conditioned Spaces

01	02	03	04	05	06	
					Additional Allowance / Adjustment	
Area Description	Complete Building or Area Category Primary Function Area	Allowed Density (W/ft²)	Area (ft²)	Allowed Wattage (Watts)	Area Category	PAF
Restroom 1	Restroom	0.65	61	39.65	No	No
Restroom 2	Restroom	0.65	61	39.65	No	No
Restroom Storage	Storage - MF common areas	0.45	33	14.85	No	No
	TOTALS:	155	94.15	See Tables J, or P for detail		

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Indoor Lighting
CALIFORNIA ENERGY COMMISSION
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Date Prepared: 2025-04-21T12:51:22-04:00

J. ADDITIONAL ALLOWANCE: AREA CATEGORY METHOD QUALIFYING LIGHTING SYSTEM

This section does not apply to this project.

K. TAILORED METHOD GENERAL LIGHTING POWER ALLOWANCE

This section does not apply to this project.

L. ADDITIONAL LIGHTING ALLOWANCE: TAILORED WALL DISPLAY

This section does not apply to this project.

M. ADDITIONAL LIGHTING ALLOWANCE: TAILORED FLOOR AND TASK LIGHTING

This section does not apply to this project.

N. ADDITIONAL LIGHTING ALLOWANCE: TAILORED DECORATIVE /SPECIAL EFFECTS

This section does not apply to this project.

O. ADDITIONAL LIGHTING ALLOWANCE: TAILORED VERY VALUABLE MERCHANDISE

This section does not apply to this project.

P. POWER ADJUSTMENT: LIGHTING CONTROL CREDIT (POWER ADJUSTMENT FACTOR (PAF))

This section does not apply to this project.

Q. RATED POWER REDUCTION COMPLIANCE FOR ONE-FOR-ONE ALTERATIONS

This section does not apply to this project.

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STATE OF CALIFORNIA
Indoor Lighting
CALIFORNIA ENERGY COMMISSION
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Project Name: Chualar Elementary School Restroom Modernization

Report Page: (Page 6 of 7)

Date Prepared: 2025-04-21T12:51:22-04:00

R. 80% LIGHTING POWER FOR ALL ALTERATIONS - CONTROLS EXCEPTIONS

This section does not apply to this project.

S. DAYLIGHT DESIGN POWER ADJUSTMENT FACTOR (PAF)

This section does not apply to this project.

T. DWELLING UNIT LIGHTING

This section does not apply to this project.

U. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION

Selections have been made based on information provided in this document. If any selections have been changed by permit applicant, an explanation should be included in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online

Form/Title
NRCI-LTI-E - Must be submitted for all buildings

V. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

Selections have been made based on information provided in this document. If any selections have been changed by the permit applicant, an explanation should be included in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and any with "-A" in the form name must be completed through an Acceptance Test Technician Certification Provider (ATTCP). For more information visit: http://www.energy.ca.gov/title24/attcp/providers.html

Form/Title	Systems/Spaces To Be Field Verified
NRCA-LTI-02-A - Must be submitted for occupancy sensors and automatic time switch controls.	Restroom 1 ; Restroom 2

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STATE OF CALIFORNIA
Indoor Lighting
CALIFORNIA ENERGY COMMISSION
CERTIFICATE OF COMPLIANCE NRCC-LTI-E
Project Name: Chualar Elementary School Restroom Modernization

Report Page: (Page 7 of 7)

Project Address: 24285 Lincoln St., Chualar, CA 93925 Date Prepared: 2025-04-21T12:51:22-04:00

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name: Najib Anwary	Documentation Author Signature:
Company: Aurum Consulting Engineers, San Jose	Signature Date: 04/21/25
Address: 1798 Technology Drive Suite 242	CEA/ HERS Certification Identification (if applicable):
City/State/Zip: San Jose, CA 95110	Phone: (408) 564-7925

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer)
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Name: Najib Anwary	Responsible Designer Signature:
Company: Aurum Consulting Engineers, San Jose	Date Signed: 04/21/25
Address: 1798 Technology Drive Suite 242	License: E21043 Exp: 03/31/27
City/State/Zip: San Jose, CA 95110	Phone: (408) 564-7925

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Indoor Lighting Mandatory Measures:

110.9 LIGHTING CONTROLS AND COMPONENTS
ALL LIGHTING CONTROL DEVICES AND SYSTEMS, AND ALL LIGHT SOURCES SHALL MEET THE APPLICABLE REQUIREMENTS OF 110.9.

NOTE: THE EXCEPTED SPACES DO NOT COUNT TOWARDS THE 10,000 FT2 THRESHOLD.

130.0 GENERAL LUMINAIRE REQUIREMENTS
ALL LUMINAIRES SHALL BE FACTORY-LABELLED PER 130.0(c).
ENERGY MANAGEMENT CONTROL SYSTEMS (EMCS) SHALL MEET REQUIREMENTS OF 130.0(e).

130.1(a) MANUAL AREA CONTROLS
EACH ROOM OR AREA WITH FLOOR-TO-CEILING WALLS IN THIS BUILDING SHALL HAVE LIGHTING CONTROLS THAT ALLOW LIGHTING TO BE MANUALLY TURNED ON AND OFF MANUAL CONTROLS SHALL:

1. BE READILY ACCESSIBLE
2. BE LOCATED IN THE SAME ENCLOSED AREA WITH THE LIGHTING IT CONTROLS.
3. PROVIDE SEPARATE CONTROL OF GENERAL, FLOOR, WALL, WINDOW CASE DISPLAY, ORNAMENTAL AND SPECIAL EFFECTS LIGHTING SO EACH TYPE CAN BE TURNED ON AND OFF SEPARATELY WITHOUT AFFECTING OTHER LIGHTING OR EQUIPMENT.

130.1(c): SHUTOFF CONTROLS
ALL INSTALLED INDOOR LIGHTING SHALL BE EQUIPPED WITH CONTROLS TO AUTOMATICALLY REDUCE LIGHTING POWER WHEN SPACE IS TYPICALLY UNOCCUPIED.

130.1(c)1: CONTROL REQUIREMENTS
ALL INSTALLED INDOOR LIGHTING SHALL HAVE ALL OF THE FOLLOWING:
A. CONTROL(S) CAPABLE OF AUTOMATICALLY SHUTTING OFF ALL LIGHTING IN THE SPACE WHEN TYPICALLY UNOCCUPIED (OCCUPANT SENSING CONTROL, AUTOMATIC TIME-SWITCH CONTROL, OR OTHER)
B. SEPARATE CONTROLS FOR LIGHTING ON EACH FLOOR (OTHER THAN STAIRWELLS)

C. SEPARATE CONTROLS FOR A SPACE ENCLOSED BY CEILING HEIGHT PARTITIONS NOT EXCEEDING 5,000 FT2

130.1(c)6 PARTIAL OR FULL-OFF OCCUPANT SENSORS
PROVIDE PARTIAL OR FULL-OFF OCCUPANT SENSORS, IN ADDITION TO SHUTOFF CONTROLS PER 130.1(c)1 AND 130.1(c)2, IN THE FOLLOWING SPACES:

- AISLE WAYS AND OPEN AREAS IN WAREHOUSES
- LIBRARY BOOK STACK AISLES
- CORRIDORS AND STAIRWELLS
- OFFICES GREATER THAN 250 SQ. FT.

Indoor Lighting Mandatory Measures:

130.1(f) CONTROL INTERACTIONS
EACH LIGHTING CONTROL INSTALLED TO MEET 130.1 REQUIREMENTS SHALL INCORPORATE THE FUNCTIONS OF OTHER LIGHTING CONTROLS REQUIRED BY THIS SECTION.

1. FOR GENERAL LIGHTING, MANUAL AREA CONTROL SHALL PERMIT THE LEVEL OF LIGHT PROVIDED WHILE LIGHTING IS ON TO BE SET OR ADJUSTED BY CONTROLS SPECIFIED IN 130.1(b), (c), (d) and (e).

2. MANUAL AREA CONTROL SHALL PERMIT SHUTOFF CONTROL TO TURN THE LIGHTING DOWN OR OFF.

3. MULTILEVEL CONTROL SHALL PERMIT THE AUTOMATIC DAYLIGHTING CONTROL TO ADJUST ELECTRIC LIGHTING IN RESPONSE TO DAYLIGHT.

4. MULTILEVEL CONTROL SHALL PERMIT THE DEMAND RESPONSIVE (DR) CONTROL TO ADJUST LIGHTING DURING A DR EVENT THEN RETURN IT TO THE LEVEL SET BY THE CONTROL AFTER THE EVENT.

5 SHUTOFF CONTROL SHALL PERMIT THE MANUAL AREA CONTROL TO TURN THE LIGHTING ON.

6. AUTOMATIC DAYLIGHTING CONTROL SHALL PERMIT MULTILEVEL LIGHTING CONTROL TO ADJUST THE LIGHTING LEVEL.

7. FOR LIGHTING CONTROLLED BY MULTILEVEL LIGHTING CONTROLS AND OCCUPANT SENSING CONTROLS THAT PROVIDE AUTOMATIC-ON FUNCTION, CONTROLS SHALL PROVIDE A PARTIAL-ON FUNCTION THAT IS CAPABLE OF AUTOMATICALLY ACTIVATING BETWEEN 50-70% OF CONTROLLED LIGHTING POWER.

8. RESERVED

9. FOR SPACE CONDITIONING SYSTEM ZONES SERVING ONLY SPACES THAT ARE REQUIRED TO HAVE OCCUPANT SENSING CONTROLS SHALL BE CONTROLLED BY OCCUPANCY SENSING CONTROLS.

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 01-122444 INC: A
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 02/11/2026

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REGISTERED PROFESSIONAL ENGINEER
No. E21043
EXP. 3/31/27
ELECTRICAL
STATE OF CALIFORNIA

CALIFORNIA ENERGY COMPLIANCE TITLE 24 - LIGHTING INDOOR
TRACK + FIELD REPLACEMENT AND NEW RESTROOM BUILDING FOR:
CHUALAR UNION E.S.
24285 LINCOLN ST. CHUALAR, CA 93925
CHUALAR UNION SCHOOL DISTRICT

REV.	DATE	DESCRIPTION
	06/23/25	1ST PLAN CHECK SUBMITTAL
	10/24/25	1ST PLAN CHECK RE-SUBMITTAL
	01/21/26	2ND BACK CHECK RE-SUBMITTAL

DATE: 05/15/2025
SCALE: AS NOTED
DRAWN:
JOB: 24033
SHEET: E0.2

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STATE OF CALIFORNIA
Outdoor Lighting
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-LTO-E
Project Name: Chualar Elementary School Restroom Modernization	**Report Page:** (Page 1 of 7)
Project Address: 24285 Lincoln St., Chualar, CA 93925	**Date Prepared:** 2025-03-21T12:39:46-04:00

This document is used to demonstrate compliance with requirements in 110.9, 130.0, 130.2, 140.7, and 141.0(b)2L for outdoor lighting scopes using the prescriptive path for nonresidential and hotel/motel occupancies. It is also used to document compliance with requirements in 160.5, 170.2(e)6, 180.1(a) and 180.2(b)4Bv for outdoor lighting scopes using the prescriptive path for multifamily and mixed-use occupancies. Multifamily includes dormitory and senior living facilities.

A. GENERAL INFORMATION

01	Project Location (city)	Chualar	04	Total Illuminated Hardscape Area (ft²)	480
02	Climate Zone	3			
03	Outdoor Lighting Zone per Title 24 Part 1 10.114 or as designated by Authority Having Jurisdiction (AHJ):				
☐	LZ-0: Very Low - Undeveloped Parkland	☒ LZ-2: Moderate - Urban Clusters	☐ LZ-4: High - Must be reviewed by CA Energy Commission for Approval		
☐	LZ-1: Low - Rural Areas	☐ LZ-3: Moderately High - Urban Areas			
05	Occupancy Types within Project				
● Classroom					

B. PROJECT SCOPE

This table includes outdoor lighting systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in 140.7 / 170.2(e)6 or 141.0(b)2L / 180.2(b)4Bv for alterations.

My Project Consists of:

01	02		
☒ New Lighting System	Must Comply with Allowances from 140.7 / 170.2(e)6		
☐ Altered Lighting System	Is your alteration increasing the connected lighting load (Watts)?	○ Yes	○ No

03	04	05
% of Existing Luminaires Being Altered[1]	Sum Total of Luminaires Being Added or Altered	Calculation Method
☐ < 10% ☐ >= 10% and < 50% ☐ >= 50%		

Please proceed to Table F. Outdoor Lighting Fixture Schedule to define the project's luminaires.

[1] FOOTNOTES: % of Existing Luminaires Being Altered = (Sum Total of Luminaires Being Added or Altered / Existing Luminaires within the Scope of the Permit Application) x 100.

STATE OF CALIFORNIA
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CERTIFICATE OF COMPLIANCE	NRCC-LTO-E
Project Name: Chualar Elementary School Restroom Modernization	**Report Page:** (Page 2 of 7)
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C. COMPLIANCE RESULTS

Results in this table are automatically calculated from data input and calculations in Tables F through N. Note: If any cell on this table says "COMPLIES with Exceptional Conditions" refer to Table D. Exceptional Conditions for guidance or see applicable Table referenced below.

Calculations of Total Allowed Lighting Power (Watts) 140.7 / 170.2(e)6 or 141.0(b)2L / 180.2(b)4Bv												Compliance Results	
01		02		03		04		05	OR	06	=	07	≥	08	09
General Hardscape Allowance 140.7(d)1 / 170.2(e)6 (See Table I)	+	Per Application 140.7(d)2 / 170.2(e)6 (See Table J)	+	Sales Frontage 140.7(d)2 (See Table K)	+	Ornamental 140.7(d)2 / 170.2(e)6 (See Table L)	+	Per Specific Area 140.7(d)2 / 170.2(e)6 (See Table M)	OR	Existing Power Allowance 141.0(b)2L / 180.2(b)4Bv (See Table N)	=	**Total Allowed** (Watts)	≥	**Total Actual** (Watts)	**07 must be >= 08**
234	+	---	+	---	+	---	+	---	OR	---	=	234	≥	39	COMPLIES
Shielding Compliance (See Table G for Details)															N/A
Controls Compliance (See Table H for Details)															COMPLIES

D. EXCEPTIONAL CONDITIONS

This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.

E. ADDITIONAL REMARKS

This table includes remarks made by the permit applicant to the Authority Having Jurisdiction.

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Report Version: 2022.0.000 Compliance ID: 282559-0325-0004
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CERTIFICATE OF COMPLIANCE	NRCC-LTO-E
Project Name: Chualar Elementary School Restroom Modernization	**Report Page:** (Page 3 of 7)
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F. OUTDOOR LIGHTING FIXTURE SCHEDULE

For new or altered lighting systems demonstrating compliance with 140.7 / 170.2(e)6 all new luminaires being installed and any existing luminaires remaining or being moved within the spaces covered by the permit application are included in the Table below. For altered lighting systems using the Existing Power method per 141.0(b)2L only new luminaires being installed and replacement luminaires being installed as part of the project scope are included (ie, existing luminaires remaining or existing luminaires being moved are not included). Outdoor lighting attached to multifamily buildings and controlled from the inside of a dwelling unit are included in Table H. and are not included here. All other multifamily outdoor lighting is included here.

Designed Wattage:

01	02		03	04	05	06	07	08	09	10	
Name or Item Tag	Complete Luminaire Description		Watts per luminaire[1, 2]	How is Wattage determined	Total Number Luminaires[2]	Luminaire Status[3]	Excluded per 140.7(a) / 170.2(e)6A	Design Watts	Cutoff Req. > 6,200 initial lumen output 130.2(b) / 160.5(c)1[4]	Field Inspector	
										Pass	Fail
XA	10"W x 4"DEEP Mini Architectural Wall Pack	☐ Linear	13	Mfr. Spec	3	New	☐	39	NA: < 6200 lumens	☐	☐
							Total Design Watts:	39			

* NOTES: Selections with a * require a note in the space below explaining how compliance is achieved.
EX: Luminaire is lighting a statue; EXCEPTION 2 to 130.2(b)

[1] FOOTNOTES: Authority Having Jurisdiction may ask for Luminaire cut sheets to confirm wattage used for compliance per 130.0(c) / 160.5(b)
[2] For linear luminaires, wattage should be indicated as W/lf instead of Watts/luminaire. Total linear feet should be indicated in column O5 instead of number of luminaires.
[3] Select "New" for new luminaires in a new outdoor lighting project, or for added luminaires in an alteration. Select "Altered" for replacement luminaires in an alteration. Select "Existing to Remain" for existing luminaires within the project scope that are not being altered and are remaining. Select "Existing Reinstaled" for existing luminaires which are being removed and reinstalled as part of the project scope.
[4] Compliance with mandatory shielding requirements is required for luminaires with initial lumen output >= 6,200 unless exempted by 130.2(b)/ 160.5(c)

G. SHIELDING REQUIREMENTS (BUG)

This section does not apply to this project.

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STATE OF CALIFORNIA
Outdoor Lighting
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CERTIFICATE OF COMPLIANCE	NRCC-LTO-E
Project Name: Chualar Elementary School Restroom Modernization	**Report Page:** (Page 4 of 7)
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H. OUTDOOR LIGHTING CONTROLS

This table demonstrates compliance with controls requirements for all new or altered luminaires installed as part of the permit application. For alteration projects, luminaires which are existing to remain (ie untouched) and luminaires which are removed and reinstalled (wiring only) do not need to be included in this table even if they are within the spaces covered by the permit application.
Outdoor lighting for nonresidential buildings, parking garages and common service areas in multifamily buildings must be documented separately from outdoor lighting attached to multifamily buildings and controlled from the inside of a dwelling unit

Mandatory Controls for Nonresidential Occupancies, Parking Garages & Common Areas in Multifamily Buildings

01	02	03	04	05	
Area Description	Shut-Off 130.2(c)1 / 160.5(c)	Auto-Schedule 130.2(c)2 / 160.5(c)	Motion Sensor 130.2(c)3 / 160.5(c)	Field Inspector	
				Pass	Fail
Restroom Entrance : "XA"	Astronomical Timer	Provided	NA: Each Luminaire <= 40 Watts	☐	☐
Storage Entrance: "XA"	Astronomical Timer	Provided	NA: Each Luminaire <= 40 Watts	☐	☐

[1] FOOTNOTE: Text has been abbreviated, please refer to Table 160.5-A to confirm compliance with the specific light source technologies listed.
[2] Authority having jurisdiction may ask for cutsheets or other documentation to confirm compliance of light source.
[3] Recessed luminaires marked for use in fire-rated installations, and recessed luminaires installed in non-insulated ceilings are excepted from ii and iii.

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STATE OF CALIFORNIA
Outdoor Lighting
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-LTO-E
Project Name: Chualar Elementary School Restroom Modernization	**Report Page:** (Page 5 of 7)
	Date Prepared: 2025-03-21T12:39:46-04:00

I. LIGHTING POWER ALLOWANCE (per 140.7 / 170.2(e))

This table includes areas using allowance calculations per 140.7 / 170.2(e). General Hardscape Allowance is per Table 140.7-A/Table 170.2-B while "Use it or lose it" Allowances are per Table 140.7-B /Table 170.2-S. Indicate which allowances are being used to expand sections for user input. Luminaires that qualify for one of the "Use it or lose it" allowances shall not qualify for another "Use it or lose it" allowance.
Outdoor lighting attached to multifamily buildings and controlled from the inside of a dwelling unit are included in Table H. and are not included here. All other multifamily outdoor lighting is included here.

	01				
		"Use it or lose it" Allowance (select all that apply) (select all that apply)			
	☒ General Hardscape Allowance Table I (below)	☐ Per Application Table J	☐ Sales Frontage Table K	☐ Ornamental Table L	☐ Per Specific Area Table M

Calculated General Hardscape Lighting Power Allowance per Table 140.7-A for Nonresidential & Hotel/Motel

02	03	04	05	06	07	08	09
Area Description	Area Wattage Allowance (AWA)			Linear Wattage Allowance (LWA)			Total General AWA + LWA (Watts)
	Illuminated Area (ft²)	Allowed Density (W/ft²)	Area Allowance (Watts)	Perimeter Length (lf)	Allowed Density (W/lf)	Linear Allowance (Watts)	
Restroom Entrance	321	0.019	6.1	93	0.15	13.95	20.05
Storage Entrance	158	0.019	3	73	0.15	10.95	13.95
Initial Wattage Allowance for Entire Site (Watts):							200
Instances of Initial Wattage Allowance (LZ 0 only)[1]							
Total General Hardscape Allowance (Watts):							234

J. LIGHTING ALLOWANCE: PER APPLICATION

This section does not apply to this project.

K. LIGHTING ALLOWANCE: SALES FRONTAGE

This section does not apply to this project.

L. LIGHTING ALLOWANCE: ORNAMENTAL

This section does not apply to this project.

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Outdoor Lighting Mandatory Measures:

110.9 OUTDOOR LIGHTING CONTROLS AND COMPONENTS
ALL LIGHTING CONTROL DEVICES AND SYSTEMS, AND ALL LIGHT SOURCES SHALL MEET THE APPLICABLE REQUIREMENTS OF 110.9.

130.0 GENERAL LUMINAIRE REQUIREMENTS
ALL LUMINAIRES SHALL BE FACTORY-LABELLED PER 130.0(c).
ENERGY MANAGEMENT CONTROL SYSTEMS (EMCS) SHALL MEET REQUIREMENTS OF 130.0(e).

130.2(c) CONTROLS FOR OUTDOOR LIGHTING
ALL OUTDOOR LIGHTING SHALL BE INDEPENDENTLY CONTROLLED FROM OTHER ELECTRICAL LOADS AND SHALL HAVE THE FOLLOWING FEATURES:

1. AUTOMATICALLY TURNS OFF OUTDOOR LIGHTING WHEN DAYLIGHT IS AVAILABLE
2. AUTOMATIC SCHEDULING CONTROLS
   - A. AUTOMATIC SCHEDULING CONTROLS SHALL BE INSTALLED FOR ALL OUTDOOR LIGHTING.
   - B. CAPABLE OF REDUCING LIGHTING POWER AT LEAST 50% AND NO MORE THAN 90% AND SEPARATELY CAPABLE OF TURNING LIGHTING OFF DURING UNOCCUPIED PERIODS
   - C. THAT ALLOW SCHEDULING OF AT LEAST TWO NIGHTTIME PERIODS WITH INDEPENDENT LIGHTING LEVELS (MAY INCLUDE OVERRIDE FOR NO MORE THAN 2 HOURS)

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STATE OF CALIFORNIA
Outdoor Lighting
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-LTO-E
Project Name: Chualar Elementary School Restroom Modernization	**Report Page:** (Page 6 of 7)
	Date Prepared: 2025-03-21T12:39:46-04:00

M. LIGHTING ALLOWANCE: PER SPECIFIC AREA

This section does not apply to this project.

N. EXISTING CONDITIONS POWER ALLOWANCE (alterations only)

This section does not apply to this project.

O. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION

Selections have been made based on information provided in this document. If any selection has been changed by permit applicant, an explanation should be included in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online

Form/Title
NRCI-LTO-E - Must be submitted for all buildings

P. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

Selections have been made based on information provided in this document. If any selection has been changed by permit applicant, an explanation should be included in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and must be completed through an Acceptance Test Technician Certification Provider (ATTCP). For more information visit: http://www.energy.ca.gov/title24/attcp/providers.html

Form/Title	Systems/Spaces To Be Field Verified
NRCA-LTO-02-A - Must be submitted for all outdoor lighting controls except for alterations where controls are added to <= 20 luminaires.	Restroom Entrance : "XA"; Storage Entrance: "XA"

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Report Version: 2022.0.000 Compliance ID: 282559-0325-0004
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STATE OF CALIFORNIA
Outdoor Lighting
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-LTO-E
Project Name: Chualar Elementary School Restroom Modernization	**Report Page:** (Page 7 of 7)
Project Address: 24285 Lincoln St., Chualar, CA 93925	**Date Prepared:** 2025-03-21T12:39:46-04:00

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name: Najib Anwary	Documentation Author Signature:
Company: Aurum Consulting Engineers, San Jose	Signature Date: 03/21/25
Address: 1798 Technology Drive Suite 242	CEA/ HERS Certification Identification (if applicable):
City/State/Zip: San Jose, CA 95110	Phone: (408) 564-7925

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer)
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Name: Najib Anwary	Responsible Designer Signature:
Company: Aurum Consulting Engineers, San Jose	Date Signed: 03/21/25
Address: 1798 Technology Drive Suite 242	License E21043 Exp: 03/31/27
City/State/Zip: San Jose, CA 95110	Phone: (408) 564-7925

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IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 01-122444 INC: A
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 02/11/2026

Peartree+Belli
ARCHITECTS
235 MONTEREY ST., SUITE B
SALINAS, CA 93901
(831) 424-4620
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Aurum Consulting Engineers
Monterey Bay, Inc.
Project No: 24-299.00
1798 Technology Drive, Suite 242, San Jose, CA 95110
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REGISTERED PROFESSIONAL ENGINEER
No. E21043
EXP. 3/31/27
ELECTRICAL
STATE OF CALIFORNIA

CALIFORNIA ENERGY COMPLIANCE TITLE 24 - LIGHTING OUTDOOR
TRACK + FIELD REPLACEMENT AND NEW RESTROOM BUILDING FOR:
CHUALAR UNION E.S.
24285 LINCOLN ST. CHUALAR, CA 93925
CHUALAR UNION SCHOOL DISTRICT

REV.	DATE	DESCRIPTION
	08/23/25	1ST PLAN CHECK SUBMITTAL
	10/24/25	1ST PLAN CHECK RE-SUBMITTAL
	01/21/26	2ND BACK CHECK RE-SUBMITTAL

DATE: 05/15/2025
SCALE: AS NOTED
DRAWN:
JOB: 24033
SHEET: E0.3

THE USE OF THESE PLANS AND SPECIFICATIONS SHALL BE RESTRICTED TO THE ORIGINAL SITE FOR WHICH THEY WERE PREPARED AND PUBLICATION THEREOF IS EXPRESSLY LIMITED TO SUCH USE. REUSE, REPRODUCTION, OR PUBLICATION BY ANY METHOD, IN WHOLE OR IN PART, IS PROHIBITED. TITLE TO THE PLANS AND SPECIFICATIONS REMAINS WITH THE ARCHITECT AND VISUAL CONTACT WITH THESE CONSTITUTES PRIMA FACIE EVIDENCE OF THE ACCEPTANCE OF THESE RESTRICTIONS.

PANELBOARD SCHEDULES

Voltage:	120/208V,1ø
Wire:	3W
Type:	NEMA 1
Mains:	100/2

[1] [2] PANEL RR

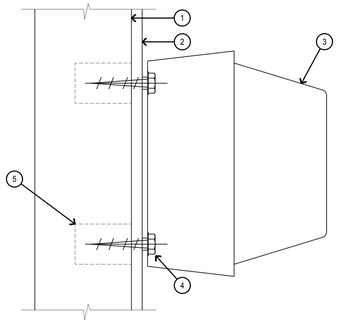
Bussing:	100A
Feed:	BOTTOM
Mounting:	SURFACE
A.I.C.	22,000

	Load	A	B	Bkr	Ck	ab	Ck	Bkr	A	B	Load	
	RESTROOM RECEPTACLES	360		20/1	1		2	20/1	180		STORAGE RECEPTACLE	
	EF-1 ,EF-2, EF-3		100	20/1	3		4	20/1		80	RESTROOM/STORAGE LIGHTS	
[3]	WATER STATION	370		20/1	5		6	20/1	40		EXTERIOR LIGHTS	
	HAND DYRER		950	15/1	7		8	20/1		100	TIME CLOCK	
	HAND DYRER	950		15/1	9		10	20/1	600		REMOTE POWER SUPPLY "RPS-R"	[4]
	TOUCHLESS FLUSH VALVE		100	20/1	11		12	20/1		50	TOUCHLESS FAUCET	
	TOUCHLESS FLUSH VALVE	100		20/1	13		14	20/1	50		TOUCHLESS FAUCET	
	SPARE			20/1	15		16	20/1			SPARE	
	SPARE			20/1	17		18	20/1			SPARE	
	SPARE			20/1	19		20	20/1			SPARE	
	SPARE			20/1	21		22	20/1			SPARE	
	SPARE			20/1	23		24	20/1			SPARE	
	SPACE ONLY			-	25		26	-			SPACE ONLY	
	SPACE ONLY			-	27		28	-			SPACE ONLY	
	SPACE ONLY			-	29		30	-			SPACE ONLY	
	SPACE ONLY			-	31		32	-			SPACE ONLY	
	SPACE ONLY			-	33		34	-			SPACE ONLY	
	SPACE ONLY			-	35		36	-			SPACE ONLY	
	SPACE ONLY			-	37		38	-			SPACE ONLY	
	SPACE ONLY			-	39		40	-			SPACE ONLY	
	SPACE ONLY			-	41		42	-			SPACE ONLY	
		1780	1150						870	230		

[1] SUBMITTAL SHALL MATCH EXACT BREAKER LOCATIONS SHOWN.
[2] LABEL PANEL FOR SHORT CIRCUIT AMPS AVAILABLE PER CEC 110-24.
[3] BREAKER SHALL BE GFCI TYPE.
[4] PROVIDE & INSTALL LOCK-ON DEVICE.

KVA Phase A	2.7
KVA Phase B	1.4

Total Load KVA	4.0
Total Load Amperes	19

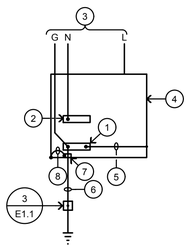


DETAIL NOTES:

1. BUILDING STUDS.
2. FOR BUILDING WALL CONSTRUCTION SEE ARCHITECTURAL DRAWINGS.
3. SURFACE MOUNTED FIXTURE. (15 LB. OR LESS).
4. 4 - #10 WOOD SCREWS WITH FLAT WASHER, 4 PER FIXTURE, PENETRATE 2" INTO BLOCKING.
5. BLOCKING 2" x 4", PROVIDE 16d STRONG HOLD NAILS TO FASTEN BLOCKING TO BUILDING STUDS OR JOIST, 4 AT EACH END (TYP).

4 WALL MOUNTED FIXTURE DETAIL

NO SCALE



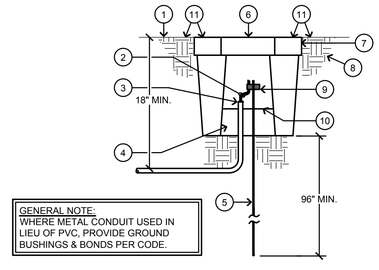
DETAIL NOTES:

1. GROUND BUS.
2. NEUTRAL BUS.
3. TO TRANSFORMER OR MAIN SWITCHBOARD.
4. DISTRIBUTION PANEL.
5. EQUIPMENT BONDING JUMPER SUPPLIED WITH PANEL INSTALLED BY CONTRACTOR.
6. 1" SCHEDULE 80 PVC CONDUIT [WITH 1 (#4) (#2) (#1/0) (#2/0) (#3/0) GROUNDING ELECTRODE CONDUCTOR] [SEE SINGLE LINE DIAGRAM1/E101 FOR GROUNDING ELECTRODE CONDUCTOR REQUIREMENTS].
7. BARE COPPER GROUND PER CEC 250-66.
8. GROUNDING BUSHING.

GENERAL NOTE:
IF AVAILABLE ON THE PREMISES AT EACH BUILDING OR STRUCTURE SERVED EACH OF THE FOLLOWING SHALL BE BONDED TOGETHER TO FORM THE GROUNDING ELECTRODE SYSTEM:
a. METAL COLD WATER PIPE,
b. METAL FRAME OF BUILDING,
c. GROUND RING,
d. OTHER ELECTRODES PER CEC 250.50

2 DISTRIBUTION PANEL GROUNDING

NO SCALE



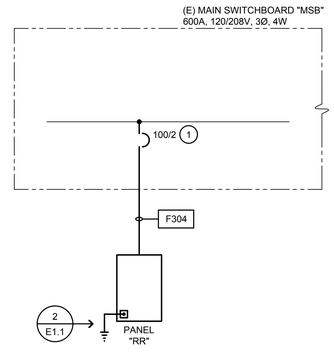
GENERAL NOTE:
WHERE METAL CONDUIT USED IN LIEU OF PVC, PROVIDE GROUND BUSHINGS & BONDS PER CODE.

DETAIL NOTES:

1. FINISHED GRADE.
2. GROUND CONDUCTOR.
3. SEAL CONDUIT WATERTIGHT.
4. GROUT BOTTOM MINIMUM 3".
5. ¾" x 10'-0" COPPER CLAD GROUND ROD.
6. LID LABELED "GROUND ROD".
7. CHRISTY "F8" GROUND ROD BOX.
8. UNDISTURBED EARTH.
9. GROUND CLAMP.
10. COAT ALL INSIDE SURFACES WITH SEALANT.
11. FLUSH WITH ½" MAX LEVEL DIFFERENCE ALONG ACCESSIBLE PEDESTRIAN ROUTES.

3 GROUND ROD BOX DETAIL

NO SCALE



DETAIL NOTES:

1. PROVIDE AND INSTALL NEW BREAKER AND ALL NECESSARY MOUNTING HARDWARE; NEW BREAKER SHALL MATCH EXISTING IN TYPE AND RATING.

FEEDER SCHEDULE

DESIGNATION	AMPACITY	CONDUIT & CONDUCTORS SIZES
F304	100	1 1/4" C., 3 #2 & 1 #8 GND.

SINGLE LINE DIAGRAM LEGEND

———	(EXISTING)
———	(NEW)
— - — - —	(E) FLOOR/PAD MOUNTED EQUIPMENT

1 SINGLE LINE DIAGRAM

NO SCALE

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 01-122444 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 02/11/2026

Peartree+Belli
ARCHITECTS
235 MONTEREY ST., SUITE B
SALINAS, CA 93901
(831) 424-4620
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Kurtzer Consulting Engineers
Monterey Bay, Inc.
Project No. 24-299.00
178 Lincoln Ave. • Salinas, CA 93901
(831) 649-3300 • FAX (831) 424-3344

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REGISTERED PROFESSIONAL ENGINEER
No. E21043
EXP. 3/31/27
ELECTRICAL
STATE OF CALIFORNIA

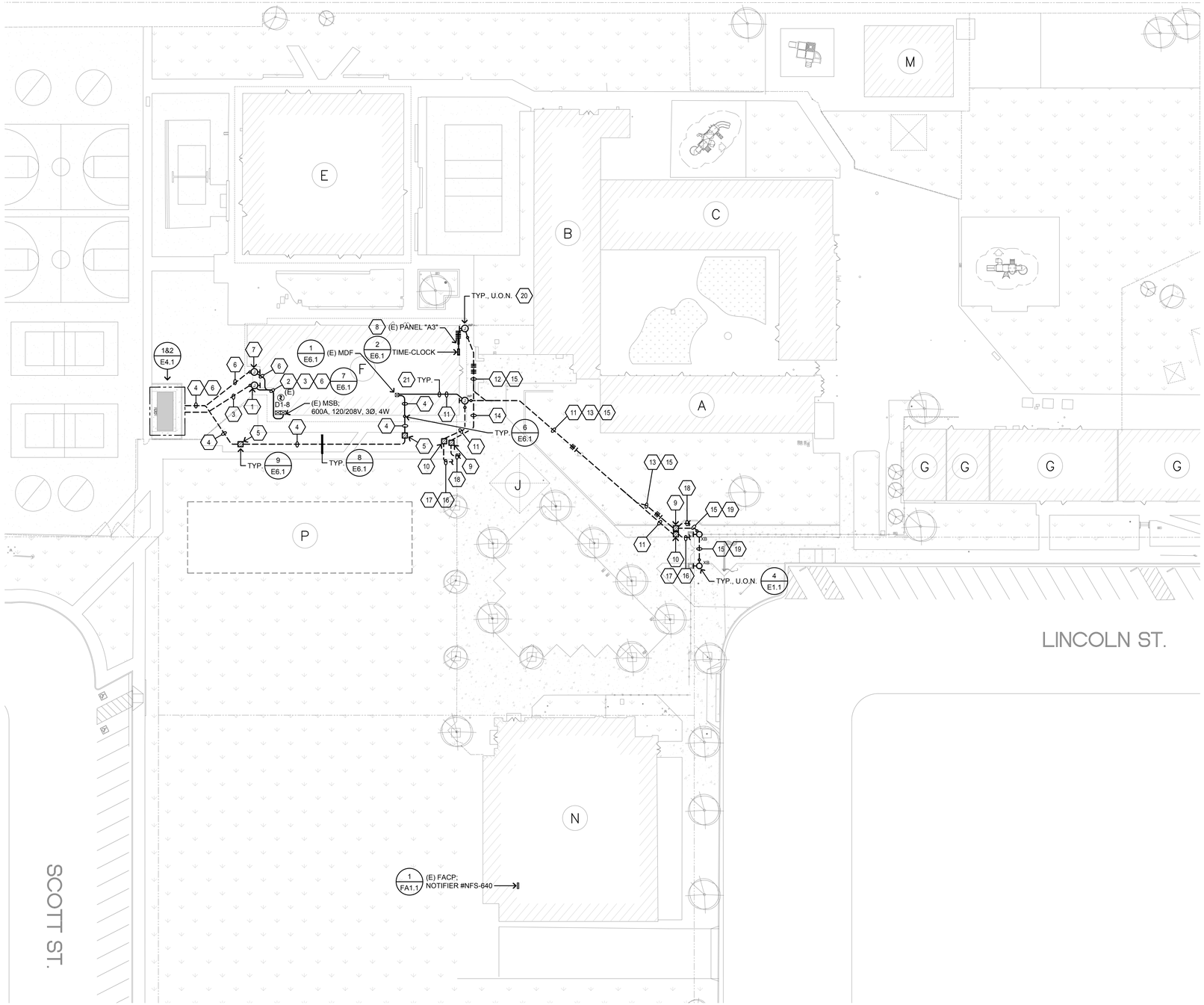
ELECTRICAL SINGLE LINE DIAGRAM & PANELBOARD SCHEDULE

TRACK + FIELD REPLACEMENT AND NEW RESTROOM BUILDING FOR:
CHUALAR UNION E.S.
24285 LINCOLN ST. CHUALAR, CA 93925
CHUALAR UNION SCHOOL DISTRICT

REV.	DATE	DESCRIPTION
	06/23/25	1ST PLAN CHECK SUBMITTAL
	10/24/25	1ST PLAN CHECK RE-SUBMITTAL
	01/21/26	2ND BACK CHECK RE-SUBMITTAL

DATE: 05/15/2025
SCALE: AS NOTED
DRAWN:
JOB: 24033
SHEET: E1.1

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SHEET NOTES

1. LOCATE UP HIGH 18"SQ X 3"DEEP NEMA 3R PULLCAN UP HIGH ON WALL FOR FEEDER ROUTING.
2. ROUTE ALONG EXTERIOR WALL.
3. FEEDER FROM MAIN SWITCHBOARD "MSB" TO NEW PANEL "RR" IN NEW RESTROOM BUILDING. SEE SHEET 1/E1.1 FOR FEEDER SIZE AND REQUIREMENTS.
4. PROVIDE AND INSTALL:
   - 2" C., FOR PA/CLOCK SYSTEM CABLES; SEE INTERCOM/CLOCK DIAGRAM, 1/E6.1.
5. PROVIDE AND INSTALL CHRISTY #N24 PULLBOX LID LABELED "SYSTEMS"
6. PROVIDE AND INSTALL:
   - 1" C., FOR FIRE ALARM CABLES; SEE SHEET FA2.1 FOR WIRE TYPE.
7. LOCATE UP HIGH 8"SQ X 3"DEEP NEMA 3R PULLCAN UP HIGH ON WALL FOR FIRE ALARM ROUTING.
8. PROVIDE AND INSTALL (3) 20A, 120V BREAKERS IN (E) PANEL "A3". MATCH EXISTING MOUNTING HARDWARE, RATING AND TYPE.
9. PROVIDE AND INSTALL CHRISTY #N09 IN-GRADE PULL-BOX LID LABELED "ELECTRICAL".
10. PROVIDE AND INSTALL CHRISTY #N09 IN-GRADE PULL-BOX LID LABELED "COMMUNICATIONS".
11. PROVIDE AND INSTALL 1 ½" C., FOR VIDEO INTERCOM, VIDEO SECURITY AND DOOR ACCESS LOW VOLTAGE CABLES.
12. CIRCUIT VIA (3) 20-AMP CIRCUIT LOCATED IN (E) PANEL "A3".
13. CIRCUIT VIA (2) 20-AMP CIRCUIT LOCATED IN (E) PANEL "A3".
14. CIRCUIT VIA 20-AMP CIRCUIT LOCATED IN (E) PANEL "A3".
15. CIRCUIT LIGHTING CIRCUIT VIA 2-CHANNEL TIME-CLOCK.
16. PROVIDE AND INSTALL ¾"C., W/ VIDEO INTERCOM/SECURITY LOW VOLTAGE CABLES. EXTEND ¾"C., W/ LOW VOLTAGE CABLES FROM PULL BOX AND CONNECT TO TD53 VIDEO INTERCOM/SECURITY. PROVIDE AND INSTALL TD53 ALL-IN-ONE VIDEO INTERCOM, VIDEO SECURITY AND DOOR ACCESS PER MANUFACTURERS INSTALLATION INSTRUCTIONS.
17. PROVIDE AND INSTALL ¾"C., W/ GATE ACCESS LOW VOLTAGE CABLES. STUB UP TO LOCATION OF GATE ACCESS. STUB UP INTO FRAMING OF GATE FOR CONNECTION TO GATE HARDWARE FOR GATE OPERATION.
18. STUB UP TO GATE STRIKE LATCH/ELECTRICAL COMPONENTS.
19. ROUTE CONDUIT FOR LIGHT FIXTURES ALONG GATE COLUMN AND UP TO LIGHT FIXTURE.
20. PROVIDE AND INSTALL 12"SQ X 4"DEEP NEMA 3R PULL CAN HIGH UP ON BUILDING WALL.
21. CONTRACTOR SHALL CUT AND PATCH WALLS/CEILINGS FOR CONDUIT ROUTING AS NECESSARY. PAINT/FINISH EXPOSED CONDUITS/BOXES TO MATCH BUILDING FINISH.

GENERAL NOTES:

A. SEAL ALL EXTERIOR/INTERIOR BUILDING PENETRATIONS, CUT AND PATCH WALLS/CEILINGS FOR CONDUIT ROUTING AS NECESSARY. PAINT/FINISH EXPOSED CONDUITS/BOXES TO MATCH BUILDING FINISH. COORDINATE WITH DISTRICT & ARCHITECT FOR EXACT REQUIREMENTS.

B. CONTRACTOR SHALL PROVIDE & INSTALL TAMPER-RESISTANT TYPE RECEPTACLES FOR ALL GENERAL 20 AMP, 120V RECEPTACLES. ONLY RECEPTACLES TO BE MOUNTED/LOCATED AT +5'-6" A.F.F. AND FOR FIXED EQUIPMENT (WITH CORD & PLUG CONNECTION) ARE NOT REQUIRED TO BE OF TAMPER-RESISTANT TYPE.

30' 0' 15' 30'
SCALE: 1"=30'-0"

NORTH

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 01-122444 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 02/11/2026

Peartree+Belli
ARCHITECTS
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179 Hickman Dr. # 1 and 324 San Jose, CA 95134
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REGISTERED PROFESSIONAL ENGINEER
JULIE ANN WU
No. E21043
EXP. 3/31/27
ELECTRICAL
STATE OF CALIFORNIA

ELECTRICAL SITE PLAN
TRACK + FIELD REPLACEMENT AND NEW RESTROOM BUILDING FOR:
CHUALAR UNION E.S.
24285 LINCOLN ST. CHUALAR, CA 93925
CHUALAR UNION SCHOOL DISTRICT

REV.	DATE	DESCRIPTION
	06/23/25	1ST PLAN CHECK SUBMITTAL
	10/24/25	1ST PLAN CHECK RE-SUBMITTAL
	01/21/26	2ND BACK CHECK RE-SUBMITTAL

DATE: 05/15/2025
SCALE: AS NOTED
DRAWN:
JOB: 24033
SHEET: E2.1

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LIGHT FIXTURE SCHEDULE

FIXTURE NOTES:

1. ALL LED LIGHT FIXTURE DRIVERS SHALL BE ELECTRONIC TYPE, 10% TOTAL HARMONIC DISTORTION MAXIMUM.
2. ALL LED LIGHT MODULES SHALL BE ENERGY SAVING 3500° K, 80 CRI MINIMUM, U.O.N. (SEE SPECIFICATIONS FOR MORE INFORMATION).
3. ALL LED DRIVERS (AND ASSOC. FIXTS.) SHALL HAVE MANUFACTURER'S CERTIFICATION OF COMPLIANCE WITH CALIFORNIA ENERGY COMMISSION STANDARDS AND REQUIREMENTS, WHERE SUCH ARE USED IN CONDITIONED SPACES.
4. EXIT SIGNS , EMERGENCY LIGHTS AND LIGHT FIXTURES WITH EMERGENCY BATTERY BACK-UP SHALL SUPPLY A MINIMUM DURATION OF 90 MINUTES OF POWER IN THE EVENT OF A POWER OUTAGE/FAILURE.
5. ALL RECESSED LIGHT FIXTURES SHALL BE U.L. APPROVED FOR ZERO CLEARANCE INSULATION COVER WHEN INSTALLED IN INSULATED CEILINGS.

TYPE	DESCRIPTION	LAMPS	MANUFACTURER	MOUNTING DETAIL
A	11"W x 4'L VANDAL- RESISTANT SURFACE MOUNTED LED FIXTURE; 120V VOLTAGE; WHITE LENS; LOW PROFILE 10-WATT EMERGENCY BATTERY BACK UP.	31W LED 3600 LUMENS	HE WILLIAMS AVX SERIES .	4 / E6.1
B	2 ½"W x 4'L SURFACE MOUNTED LED FIXTURE; 120V VOLTAGE; DIFFUSED MATTE LENS; LOW PROFILE 10-WATT EMERGENCY BATTERY BACK UP.	16.2W LED 2000 LUMENS	HE WILLIAMS 75L SERIES .	4 / E6.1
XA	10"W x 4" DEEP MINI ARCHITECTURAL WALL PACK; FINISH BLACK; 120V VOLTAGE.	13W LED 1000 LUMENS	HE WILLIAMS VWM VERTICAL SERIES .	5 / E6.1
XB	13"L x 8" W x 4" DEEP LED WALL SCONCE; FINISH PER ARCH; 120V VOLTAGE.	20W LED 2000 LUMENS	EVERGREEN LIGHTING SERIES 40	4 / E1.1

SHEET NOTES

1. PROVIDE AND INSTALL #N24 PULLBOX LID LABELED "SYSTEMS".
2. PROVIDE AND INSTALL 12"W X 6" DEEP NEMA SYSTEMS TERMINATION CAN (STC) FOR FIRE ALARM CONDUIT & PA/SPEAKER CONDUIT ROUTING.
3. FOR FEEDER SIZE AND REQUIREMENTS TO "MSB" SEE SHEET 1/E1.1.
4. PROVIDE AND INSTALL #N24 PULLBOX LID LABELED "ELECTRICAL.".
5. ½"C., TO SYSTEMS TERMINATION CAN.
6. PROVIDE AND INSTALL:
   - 2" C., FOR PA/CLOCK SYSTEM CABLES; SEE INTERCOM/CLOCK DIAGRAM, 1/E6.1.
   - 1" C., FOR FIRE ALARM CABLES; SEE SHEET FA2.1 FOR WIRE TYPE.
7. CONNECT EMERGENCY BATTERY BACK UP TO UNSWITCHED HOT, ALLOW FOR NORMAL SWITCHING.
8. CIRCUIT VIA TIME CLOCK. SCHEDULE ON/OFF TIMES WITH OWNER.
9. LOCATE FOR FLUSH MOUNTED SENSOR TRANSFORMER.
10. LOCATE FOR WATER STATION; 1 AMP, 120V.
11. LOCATE FOR HAND DRYER; 950W, 120V.
12. LOCATE FOR FAUCET SENSOR TRANSFORMER. PRIMARY INPUT 120V, SECONDARY OUTPUT 12V.
13. EXHAUST FAN; 21W, 120V.
14. STRUCTURAL FOUNDATION HOLD DOWNS SHOWN W/ 24" CONDUIT PENETRATION CLEARANCES, SEE STRUCTURAL DRAWINGS FOR DETAILS. KEEP ALL UNDERGROUND CONDUIT PENETRATIONS MIN. 24" FROM HOLD DOWN LOCATIONS.

BRANCH CIRCUIT CONDUCTOR SIZING TABLE

CIRCUIT AMPACITY/VOLTAGE	CIRCUIT LENGTH	REQUIREMENT
20/120	56'-90'	½" C., 2 #10 & 1 #10 GND.
20/120	91'-140'	½" C., 2 #8 & 1 #8 GND.
20/277	131'-205'	½" C., 2 #10 & 1 #10 GND.
20/277	206'-330'	½" C., 2 #8 & 1 #8 GND.

NOTE:

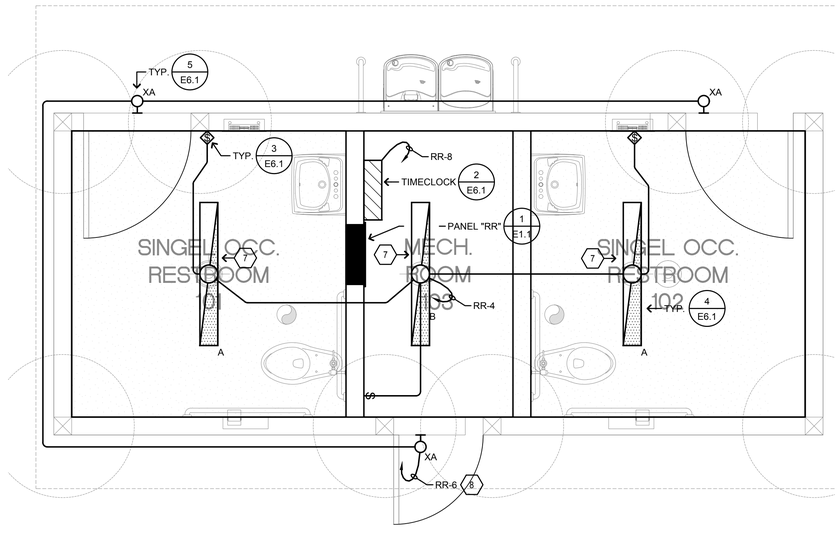
A. CONTRACTOR SHALL SIZE BRANCH CIRCUIT CONDUCTORS PER THE TABLE ABOVE AS DETERMINED BY THE CIRCUIT CONDUCTOR LENGTH, U.O.N. CONTRACTOR SHALL SPLICE TO #12 AWG WITHIN TERMINATION BOX FOR DEVICE CONNECTION IF NECESSARY.

B. WHERE THE UNGROUNDED CONDUCTORS IS INCREASED IN SIZE, INCLUDING FOR VOLTAGE DROP, THE GROUNDED CONDUCTOR SHALL BE INCREASED IN SIZE PROPORTIONATELY PER CEC 250.122(B)

GENERAL NOTES:

A. SEAL ALL EXTERIOR/INTERIOR BUILDING PENETRATIONS, CUT AND PATCH WALLS/CEILINGS FOR CONDUIT ROUTING AS NECESSARY. PAINT/FINISH EXPOSED CONDUITS/BOXES TO MATCH BUILDING FINISH. COORDINATE WITH DISTRICT & ARCHITECT FOR EXACT REQUIREMENTS.

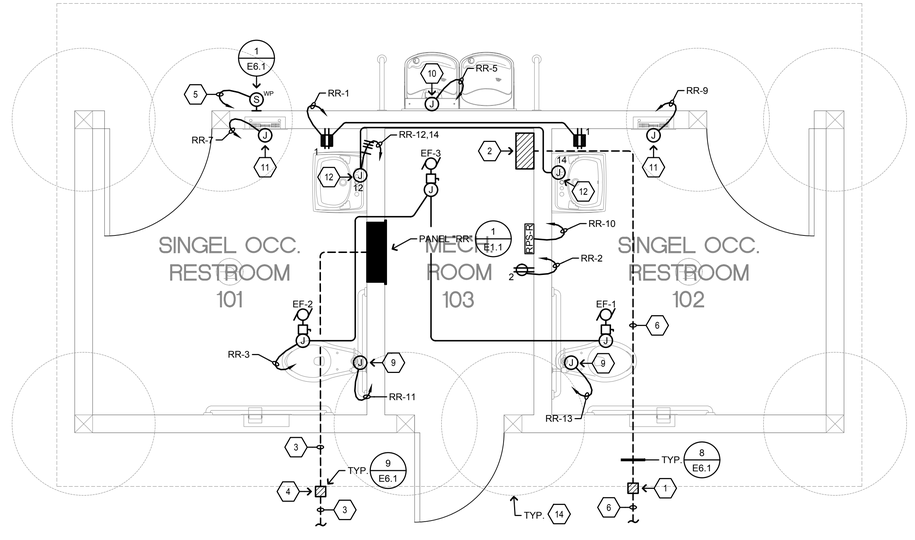
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2 LIGHTING PLAN

SCALE: 1/2"=1'-0"

NORTH



1 POWER & SYSTEMS PLAN

SCALE: 1/2"=1'-0"

NORTH

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APP: 01-122444 INC:
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DATE: 02/11/2026

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REGISTERED PROFESSIONAL ENGINEER
JOAO B. ANNORY
No. E21043
EXP. 3/31/27
ELECTRICAL
STATE OF CALIFORNIA

POWER, SYSTEMS & LIGHTING PLAN

TRACK + FIELD REPLACEMENT AND NEW RESTROOM BUILDING FOR:

CHUALAR UNION E.S.

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CHUALAR UNION SCHOOL DISTRICT

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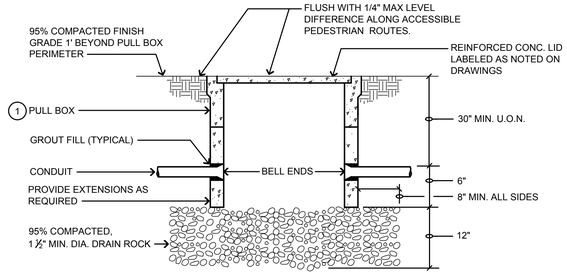
DATE: 05/15/2025
SCALE: AS NOTED
DRAWN:
JOB: 24033
SHEET: E4.1

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DATE: 02/11/2026

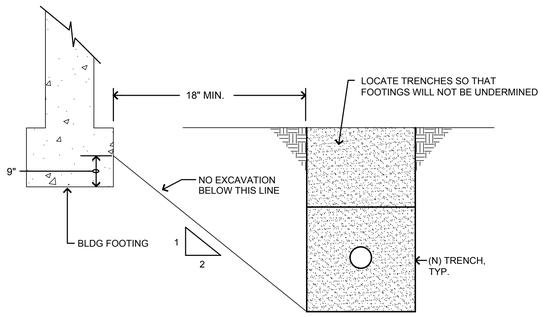
DETAIL NOTES:

1. SIZE(S) & MFGR. AS NOTED ON DRAWINGS.

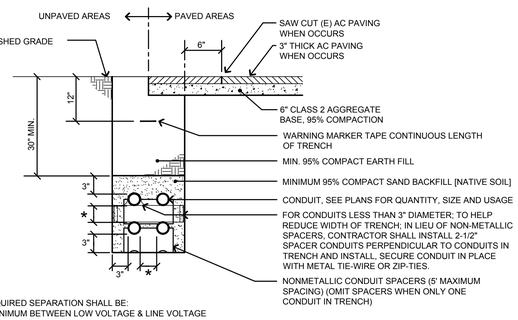


9 TYPICAL PULLBOX DETAIL

NO SCALE



TRENCH NEAR BLDG FOOTING



★ = REQUIRED SEPARATION SHALL BE:
12" MINIMUM BETWEEN LOW VOLTAGE & LINE VOLTAGE CONDUITS LIKE SYSTEMS REQUIRE 3" SEPARATION

NOTES FOR CLEARANCES:

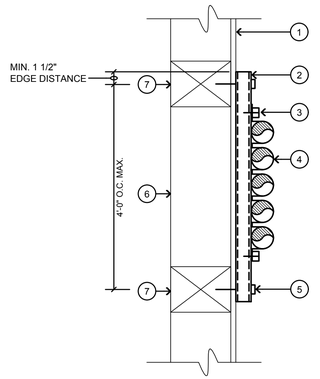
1. THE MINIMUM RECOMMENDED SEPARATIONS BETWEEN TELECOMMUNICATIONS CONDUIT SYSTEMS AND OUTSIDE SURFACES OF FOREIGN STRUCTURES VARY IN ACCORDANCE WITH REGIONAL STANDARDS, CODES, AND REGULATIONS:
   a. 6" MIN. WHEN CROSSING PIPES (E.G., GAS, WATER, OIL)
   b. 12" MIN. WHEN PARALLEL TO PIPES (E.G., GAS, WATER, OIL)
   c. 3" MIN. CONCRETE FOREIGN CONDUIT (POWER OR OTHER)
   d. 4" MIN. MASONRY (POWER OR OTHER)
   e. 12" MIN. OF WELL-TAMPED EARTH (POWER OR OTHER)
2. THE TOP OF CONDUIT SHOULD BE LOCATED AT A SUFFICIENT DEPTH (NORMALLY 24"-30") BELOW SURFACE GRADE SO BOTH LIVE OR DYNAMIC AND DEAD (STATIC) OR EARTH LOADS CAN BE SUSTAINED BY THE CONDUIT STRUCTURE.

NOTES:

1. SAW CUT, TRENCH & BACKFILL FOR NEW CONDUITS. PATCH WALKWAY TO MATCH (E) SURROUNDING SURFACES. CARE SHALL BE TAKEN TO PROTECT EXISTING TREES. RESEED OR RESOD (E) DISTURBED PLANTED AREAS TO ARCHITECT'S SATISFACTION.
2. BASE MATERIAL TO BE REPLACED TO THE DEPTH OF EXISTING BASE AND COMPACTED TO A MIN. 95% RELATIVE COMPACTION. A.C. MAY BE SUBSTITUTED FOR BASE MATERIAL. WHEN USED AS BACKFILL, CLASS 100-E-100 P.C.C. MAY BE SUBSTITUTED FOR BASE MATERIAL.

8 TYPICAL TRENCH SECTION

NO SCALE



GENERAL NOTE:

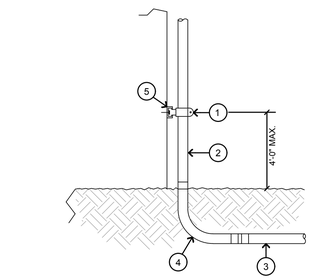
REFER TO 3/A6.1 ON THE ARCHITECTURAL DRAWINGS FOR PATCH AND REPAIR WORK.

DETAIL NOTES:

1. EXISTING WALL.
2. UNISTRUT P1000, 4'-0" O.C. MAX SPACING.
3. CONDUIT CLAMPS.
4. CONDUIT, SEE PLANS (MAXIMUM 10LBS/ FT.).
5. LAG SCREW ¼"Ø AND WASHER, MINIMUM 2" PENETRATIONS OF STUD, TYP.
6. EXISTING STUD.
7. 4"x4" BLOCKING BETWEEN STUDS WITH SIMPSON STRONG-TIE FRAMING CLIP A35. TOP AND BOTTOM EACH END.

7 WALL MOUNTED UNISTRUT CONDUIT SUPPORT

NO SCALE



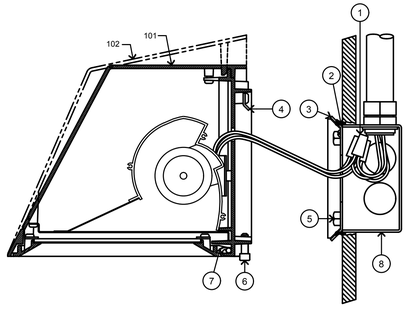
DETAIL NOTES:

1. UNISTRUT BRACKET.
2. GALVANIZED RIGID STEEL CONDUIT.
3. SCHEDULE 40 PVC.
4. WRAPPED GALVANIZED RIGID STEEL ELBOW AND UNDERGROUND RISER.
5. UNISTRUT P1000 SPAN ACROSS AND ENGAGE 3 STUDS MIN.

GENERAL NOTES:
A. FOR WOOD STUD WALL:
   USE ¼" LAG BOLT WITH MIN. 2" PENETRATION INTO 4x4 BLOCKING BETWEEN STUDS WITH A35 T&B AT EACH END SIMILAR TO DETAIL 7/E6.1.
B. FOR CONCRETE WALL:
   USE ⅜" WEDGE ANCHOR WITH MIN. 2 ½" EMBEDMENT INTO CONCRETE WALL. (ONE AT EACH END OF BRACKET)

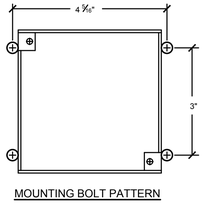
6 UNDERGROUND CONDUIT RISER DETAIL

NO SCALE



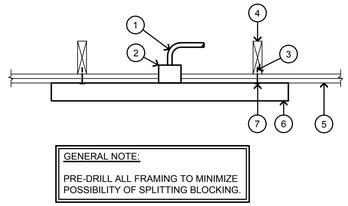
DETAIL NOTES:

1. SPLICES.
2. SEALANT.
3. MOUNTING BRACKET.
4. HANGER BRACKET.
5. ⅝ LAG BOLT WITH MIN. 2" PENETRATION INTO 4x4 BLOCKING BETWEEN STUDS WITH A35 T&B AT EACH END SIMILAR TO DETAIL 7/E6.1.
6. LOCKING SCREW.
7. RETAINING CLIP.
8. SPLICE BOX.



MOUNTING BOLT PATTERN

5 FIXTURE MOUNTING DETAIL



DETAIL NOTES:

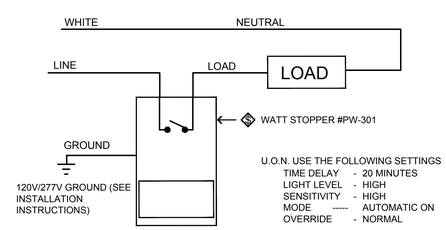
1. BRANCH CIRCUIT CONDUIT.
2. FIXTURE OUTLET BOX.
3. ALL SCREWS TO HAVE MIN. 1½" PENETRATION INTO FRAMING.
4. 2" MIN. SCREW PENETRATION INTO FRAMING, REFER TO DETAIL 7/S3.2.
5. FINISHED CLG. MATERIAL. (SEE ARCH).
6. SURFACE MOUNT FIXTURE.
7. FASTEN FIXTURE TO FRAMING W/ ¼" DIA. LAG SCREW AT EACH CORNER.

GENERAL NOTE:

PRE-DRILL ALL FRAMING TO MINIMIZE POSSIBILITY OF SPLITTING BLOCKING.

4 SURFACE MOUNTED FIXTURE DETAIL

NO SCALE

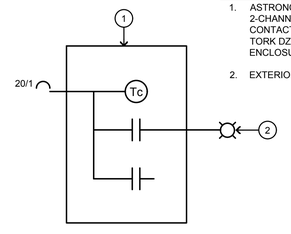


U.O.N. USE THE FOLLOWING SETTINGS
TIME DELAY - 20 MINUTES
LIGHT LEVEL - HIGH
SENSITIVITY - HIGH
MODE ----- AUTOMATIC ON
OVERRIDE - NORMAL

FOR TECHNICAL SUPPORT CALL 1-800-879-8585

3 WALL OCCUPANCY SENSOR WIRING

NO SCALE

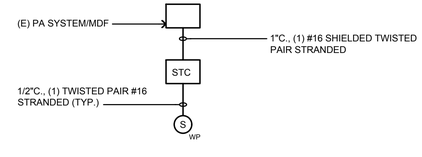


DETAIL NOTES:

1. ASTRONOMIC TIMECLOCK, 2-CHANNEL 20A N.O. RATED CONTACTS, RESERVE POWER TORK DZS200BP, (WITH NEMA 3R ENCLOSURE).
2. EXTERIOR LIGHTS.

2 EXTERIOR LIGHTING CONTROL

NO SCALE



1 INTERCOM DIAGRAM

NO SCALE

Peartree+Belli
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REGISTERED PROFESSIONAL ENGINEER
JOHN B. ANNARY
No. E21043
EXP. 3/31/27
ELECTRICAL
STATE OF CALIFORNIA

ELECTRICAL DETAILS

TRACK + FIELD REPLACEMENT AND NEW RESTROOM BUILDING FOR:

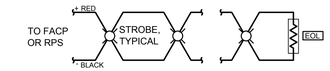
CHUALAR UNION E.S.

24285 LINCOLN ST. CHUALAR, CA 93925
CHUALAR UNION SCHOOL DISTRICT

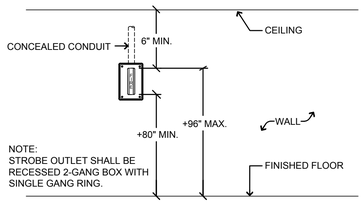
REV.	DATE	DESCRIPTION
	06/23/25	1ST PLAN CHECK SUBMITTAL
	10/24/25	1ST PLAN CHECK RE-SUBMITTAL
	01/21/26	2ND BACK CHECK RE-SUBMITTAL

DATE: 05/15/2025
SCALE: AS NOTED
DRAWN:
JOB: 24033
SHEET: E6.1

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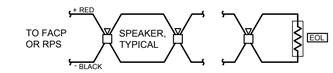


TYPICAL STROBE WIRING DIAGRAM

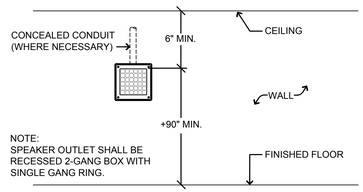


5 STROBE INSTALLATION DETAIL

NO SCALE

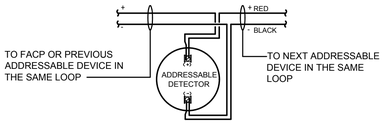


TYPICAL SPEAKER WIRING DIAGRAM

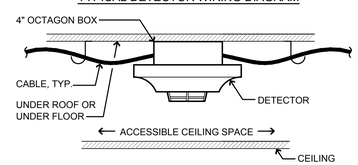


4 SPEAKER INSTALLATION DETAIL

NO SCALE

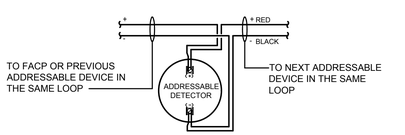


TYPICAL DETECTOR WIRING DIAGRAM

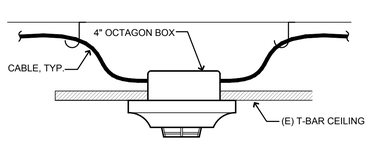


2 DETECTOR MOUNTING DETAIL

NO SCALE (ABOVE CEILING)



TYPICAL DETECTOR WIRING DIAGRAM



1 DETECTOR MOUNTING DETAIL

NO SCALE

FIRE ALARM EQUIPMENT LIST

SYMBOL	DESCRIPTION AND MODEL NUMBER	MFGR'S PART No.	CSFM LISTING
(E) FACP	ADDRESSABLE FIRE ALARM CONTROL PANEL WITH DVC EM AUDIO OPTION AND INTEGRATED MICROPHONE, NOTIFIER NFS2 SERIES; EXISTING FIRE ALARM DOCUMENT CABINET NEXT TO FACP.	NFS2-640	7165-0028:0224
RPS	10.0A AUXILIARY POWER SUPPLY WITH 4 NAC OUTPUT CIRCUITS AND BUILT-IN SYNCHRONIZATION, NOTIFIER HPF SERIES.	HPF-PS10	7315-1637:0505
	ADDRESSABLE PHOTO ELECTRIC FIRE ALARM SMOKE DETECTOR AND BASE, NOTIFIER FSP-951 SERIES.	FSP-951	7272-0028:0503
	ADDRESSABLE FIRE ALARM HEAT DETECTOR AND BASE, 135 DEG. FIXED TEMPERATURE AND RATE-OF-RISE, NOTIFIER FST-951 SERIES. (DEVICES WITH "A" INDICATE ABOVE CEILING).	FST-951	7270-0028:0502
WP	WALL MOUNTED WEATHERPROOF FIRE ALARM HORN, SYSTEM SENSOR HGRKL SERIES.	HGRKL	7135-1653:0534
	WALL MOUNTED MULTI-CANDELA, STROBE WITH FIELD SELECTABLE CANDELA SETTINGS OF 15, 30, 75 AND 110 CANDELA, SYSTEM SENSOR SWLED SERIES.	SWLED	7300-1653:0525
M	ADDRESSABLE MONITOR MODULE, NOTIFIER FMM-1 SERIES.	FMM-1	7300-0028:0219
C	ADDRESSABLE CONTROL MODULE, NOTIFIER FCM-1 SERIES.	FCM-1	7300-0028:0219
EOL	END OF LINE DEVICE.		

FACP RESETTING PROCEDURE

NFS2-3030 OPERATING INSTRUCTIONS

Section 1 Operating Information

Normal Standby Operation.
1. Green POWER indicator lit steadily.
2. Red FIRE ALARM indicator off.
3. Yellow TROUBLE indicators off.

Alarm Condition.
1. Red FIRE ALARM indicator lit.
2. Alarm signaling devices activated.
3. Option module (remote station or supplementary alarm relay) activated.
4. Alarm information visible on LCD (liquid crystal display).

Alarm Reset. After locating and correcting the alarm condition, reset the control panel by pressing the SYSTEM RESET switch.

Trouble Condition. Activation of trouble signal under normal operation indicates a condition that requires immediate attention. Contact your local service representative. Silence the audible signal by pressing the ACKNOWLEDGE switch. The trouble indicator will remain illuminated.

Section 2 NFS2-3030 Switch Functions

ACKNOWLEDGE. This silences the piezo sounder and changes all flashing conditions to steady. It sends an acknowledge message to the printer and history file. ACKNOWLEDGE also automatically sends a special command to silence piezo sounders on ACS Annunciators. If more than one event exists, it advances the display to the next item and displays it until the ACKNOWLEDGE switch is pressed again. Only one press is necessary for non-fire, trouble, or supervisory signals.

SIGNAL SILENCE. SIGNAL SILENCE turns off all silenceable circuits and illuminates the SIGNALS SILENCED indicator. It also sends a SIGNALS SILENCED message to the LCD, printer, and history file. A subsequent alarm will then resound the system.

Notes:
1. This system is programmed to inhibit signal silence for ____seconds.
2. This system is programmed to automatically silence alarm signal after _____ minutes.

DRILL. The NFS2-3030 waits for the DRILL switch to be pressed for 2 seconds, then turns on all silenceable circuits (all control module/panel circuits that are programmed silenceable for fire alarms), and turns off the SIGNALS SILENCED LED. This event shows on the LCD, printer, and History file.
Note: This switch is only available on NFS2-3030 with keypad/display.

SYSTEM RESET. Resets the control panel in standalone applications. Resets panel when enabled in network applications.

LAMP TEST. Press and hold the switch to lamp-test the LEDs.

Section 3 LED Indicators

Controls Active. Green LED which illuminates when the NFS2-3030 assumes control of the network primary display.

Power . Green LED which illuminates when primary power is applied to the control panel.

Fire Alarm. Red LED that flashes when one or more alarms occur. Illuminates steadily after alarms are acknowledged, and turns off when SYSTEM RESET is pressed after alarm clears.

Pre-Alarm. Red LED that flashes when a pre-alarm threshold is reached.

Security. Blue LED that illuminates for a security alarm. LED turns off after the alarm clears and SYSTEM RESET is pressed.

Supervisory. Yellow LED that flashes when a Supervisory or Tamper condition occurs, such as a sprinkler valve tamper condition. The LED illuminates steady after conditions are acknowledged, and turns off when the conditions are cleared. The Tamper Indication will latch until SYSTEM RESET is pushed.

System Trouble. Yellow LED that flashes when one or more troubles occur. Goes on steadily when ACKNOWLEDGE is pressed, and turns off when all trouble conditions are cleared.

Other Event. Yellow LED flashes when a process monitor, hazard alert or weather alert occurs. Goes on steadily when ACKNOWLEDGE is pressed, and turns off when the condition is cleared.

Signals Silenced. Yellow LED that illuminates after SIGNALS SILENCED has been pressed. Turns off when DRILL or SYSTEM RESET is pressed.

Point Disabled. Yellow LED that illuminates when one or more points are disabled. The LCD will indicate which points have been disabled. Turns off when points are re-enabled.

CPU Failure. Yellow LED that illuminates if the microprocessor fails.

Section 4 NFS2-3030 Audible Sounder

Alarm. A continuous sounding tone.

Trouble, Disable, Prealarm. Two beeps per second.

Supervisory. Four beeps per second.

Security. Eight beeps per second.

Section 5 Periodic Testing and Maintenance

To ensure proper and reliable operation, system inspection and testing should be scheduled monthly, or as required by NFPA 72 or local fire codes. A qualified Service Representative should perform testing.

Before Testing: Notify fire department and/or central alarm receiving station if alarm condition is transmitted. Notify facility personnel of the test so alarm sounding devices are ignored during the test period. *Physically disconnect releasing devices.*

Remote Connection Feature: ULC requires that devices such as UDACT and TM-4 be disconnected during annual testing to prevent transmission of false alarms.

UDACT: Disable by turning the internal AKS-1 keyswitch.

TM-4: Slide SW4 Disable All Output switch from "Enable" to "Disable."

After Testing: Verify that remote-connection devices are turned back on. Notify all fire, central station, and/or building personnel when testing is complete. *Re-connect releasing devices.*

Section 6 Local Service Representative:

NAME: _____

ADDRESS: _____

TELEPHONE NUMBER: _____

This sheet must be framed and mounted adjacent to the control panel.
Document 52547 Rev B ECN 08-364 8/18/2008

FIRE ALARM GENERAL NOTES

1. WIRING MUST BE LISTED FOR USE AS REQUIRED BY TITLE 24/CEC, ARTICLE 760.
2. WIRE USED IN WET LOCATIONS SHALL BE OF AN APPROVED TYPE IN ACCORDANCE WITH 3-310-8, T24/CEC (I.E. THHW OR EQUAL).
3. UNDER GROUND AND EXTERIOR CONDUITS TO HAVE WATERTIGHT FITTINGS AND WIRES APPROVED FOR WET LOCATION.
4. ALL CONDUCTORS SHALL BE ROUTED IN CONDUIT UNLESS SPECIFICALLY NOTED OTHERWISE ON PLANS. MINIMUM CONDUIT SIZE SHALL BE 3/4."
5. THE CONDUIT AND WIRE SHOWN ON THESE PLANS ARE SHOWN DIAGRAMMATICALLY. EXACT LOCATIONS SHALL BE DETERMINED IN THE FIELD TO SUIT FIELD CONDITIONS. "AS-BUILT" PLANS SHALL BE MAINTAINED AND BE PROVIDED AS REQUIRED BY THE PROJECT INSPECTOR OF RECORD.
6. PENETRATIONS OF FIRE RATED WALLS SHALL BE PROTECTED IN ACCORDANCE WITH CALIFORNIA BUILDING CODE, CHAPTER 7, TITLE 24. PROVIDE DETAILS OF THROUGH PENETRATION FIRE-STOP SYSTEMS FOR ALL PIPE/CABLE/CONDUIT PASSING THROUGH FIRE RATED WALLS/FLOORS REQUIRING PROTECTED OPENINGS.
7. ALL DEVICES SHALL BE "CSFM" LISTED.
8. EXTERIOR DEVICES SHALL BE LISTED FOR EXTERIOR USE BY "CSFM."
9. AUDIBLE ALARM PRODUCED BY "FACP" SHALL SOUND THE CALIFORNIA UNIFORM SIGNAL IN TEMPORAL MODE.
10. AUDIBLE FIRE ALARM SOUND LEVEL SHALL BE AT LEAST 15DBA ABOVE THE AVERAGE SOUND LEVEL.
11. AUDIBLE SIGNALS INTENDED FOR OPERATION IN THE PUBLIC SHALL HAVE A SOUND LEVEL OF NOT LESS THAN 75DBA AT 10 FEET OR MORE THAN 110DBA AT THE MINIMUM HEARING DISTANCES FROM THE AUDIBLE APPLIANCE.
12. WHERE VISUAL DEVICES ARE REQUIRED, VISUAL DEVICE SHOULD NOT EXCEED 2 FLASHES PER SECOND AND SHOULD NOT BE SLOWER THAN 1 FLASH EVERY SECOND. THE DEVICE SHALL HAVE A PULSING LIGHT SOURCE NOT LESS THAN 15 CANDELA. NO PLACE IN ANY ROOM SHALL BE MORE THAN 50 FEET FROM A DEVICE.
13. APPROVED BY THE "DIVISION OF THE STATE ARCHITECT/OFFICE OF REGULATION SERVICES." CONTRACTOR SHALL PROVIDE COPIES OF APPROVED PLANS TO THE PROJECT INSPECTOR OF RECORD PRIOR TO BEGINNING WORK. THE CONTRACTOR SHALL SUBMIT SHOP DRAWING TO ENGINEER PRIOR TO PURCHASE FOR REVIEW. THE FIRE PROTECTION SYSTEM SHALL NOT BE INSTALLED UNTIL SHOP DRAWINGS HAVE BEEN SUBMITTED TO AND RECEIVED BY THE ENGINEER OF RECORD.
14. FINAL ALARM TEST SHALL BE WITNESSED BY THE DSA INSPECTOR OF RECORD (IOR). BOTH THE DSA INSPECTOR OF RECORD (IOR) AND THE LOCAL FIRE AUTHORITY SHALL BE NOTIFIED OF DATE AND TIME OF FINAL FIRE ALARM TESTING BY THE FIRE ALARM CONTRACTOR. FIRE ALARM CONTRACTOR SHALL PROVIDE "RECORD OF COMPLETION" TO THE INSPECTOR OF RECORD (IOR)/DSA AFTER COMPLETION OF OPERATIONAL ACCEPTANCE TEST. DSA, ARCHITECT/ENGINEER AND OWNER SHALL BE NOTIFIED A MINIMUM OF 48 HOURS PRIOR TO THE FINAL INSPECTION AND/OR TESTING.
15. POWER SERVICE SHALL BE ON A DEDICATED, 120V BRANCH CIRCUIT, WITH A RED MARKING AND IDENTIFIED AS "FIRE ALARM CIRCUIT CONTROL."
16. AUTOMATIC FIRE ALARM SYSTEM SHALL TRANSMIT THE ALARM, SUPERVISORY AND TROUBLE SIGNALS TO AN APPROVED SUPERVISING STATION AS REQUIRED BY NFPA 72 AS AMENDED BY CFC CHAPTER 80. THE SUPERVISING STATION SHALL BE LISTED AS EITHER UUFX OR UUJS BY UNDERWRITERS LABORATORY OR SHALL MEET THE REQUIREMENTS OF FACTORY MUTUAL RESEARCH APPROVAL STANDARD 3011.
17. EXISTING FIELD DEVICES AND FACP SHALL REMAIN IN PLACE UNTIL NEW FIELD DEVICES ARE IN PLACE AND NEW WIRING HAS BEEN HOMERAN TO NEW LOCATION OF FACP. CONTRACTOR SHALL COORDINATE WITH SCHOOL DISTRICT TO PROVIDE AN APPROVED 24 HOUR FIRE WATCH UNTIL NEW FIRE ALARM SYSTEM IS OPERATIONAL.
18. CONTRACTOR SHALL PROGRAM FIRE ALARM CONTROL PANEL/UNIT FOR ALL DEVICES TO BE ADDRESSED AND LOCATIONS TO APPEAR ON PANEL AND REPORT TO MONITORING AGENCY WITH PHYSICAL LOCATION DESCRIPTION AND ADDRESS OF DEVICES.
19. ALL USERS OF SYSTEMS THAT HAVE MICROPHONES FOR LIVE VOICE ANNOUNCEMENTS SHALL BE PROVIDED WITH POSTED INSTRUCTIONS OF USING THE MICROPHONE PER NFPA 72, SECTION 24.3.2.
20. AUDIBLE APPLIANCES SHALL PROVIDE 15-dBA ABOVE AMBIENT NOISE LEVELS IN ALL OCCUPIED AREAS AND INTELLIGIBILITY WHERE REQUIRED CBC 907.5.2.1.1.
21. THE GROUP E BUILDINGS WERE CONSTRUCTED BEFORE THE ADOPTION OF THE 2016 CALIFORNIA BUILDING STANDARDS CODE AND WILL NOT REQUIRE CARBON MONOXIDE DETECTION PER CEBC SECTION 503.15.1.
22. SMOKE ALARMS AND SMOKE DETECTORS SHALL NOT BE INSTALLED WITHIN A 36 IN. (910 MM) HORIZONTAL PATH FROM THE SUPPLY REGISTERS OF A FORCED AIR HEATING OR COOLING SYSTEM AND SHALL BE INSTALLED OUTSIDE OF THE DIRECT AIRFLOW FROM THOSE REGISTERS PER NFPA 72, SECTION 29.11.3.4(7).

SYMBOLS & ABBREVIATIONS

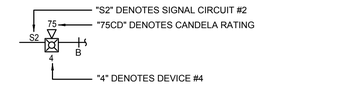
SYMBOLS

- ——— CONDUIT - CONCEALED IN WALLS OR CEILING.
- - - - - - - CONDUIT - IN OR BELOW FLOOR: 3/4"C MIN.
- CONDUIT CONTINUATION.
- 201 ROOM NUMBER.
- 2 SHEET NOTE REFERENCE SYMBOL; SEE ASSOCIATED NOTE ON SAME SHEET.
- 2 / E1 DETAIL OR SECTION DESIGNATION.

ABBREVIATIONS

ARCH.	ARCHITECT	FSD	FIRE SMOKE DAMPER
AWG	AMERICAN WIRE GAUGE	IDC	INITIATING DEVICE CIRCUITS
BKR	BREAKER	(N)	NEW
C	CONDUIT	NAC	NOTIFICATION APPLIANCE CIRCUITS
CB	CIRCUIT BREAKER	NIC	NOT IN CONTRACT
CKT	CIRCUIT	NO	NUMBER
CLG	CEILING	SLC	SIGNALING LINE CIRCUITS
(E)	EXISTING	TYP	TYPICAL
EOL	END OF LINE	UON	UNLESS OTHERWISE NOTED
FA	FIRE ALARM	WP	WEATHERPROOF
FACP	FIRE ALARM CONTROL PANEL		
FBO	FURNISHED BY OTHERS		

TYPICAL ZONE NOMENCLATURE



PROJECT DESCRIPTION

SCOPE OF WORK:
ADDITION AND EXTENSION OF AUTOMATIC FIRE ALARM SYSTEM TO NEW RESTROOM BUILDING.

SYSTEM DESCRIPTION:
SLC = CLASS B / STYLE A
IDC = CLASS B / STYLE B
NAC = CLASS B / STYLE Y

FIRE ALARM SYSTEM DESIGN BY:
NAJIB ANWARY

FIRE ALARM SYSTEM OPERATIONAL MATRIX

CAUSE	EFFECT: ALARM AT FACP	ALARM AT ANNUNCIATOR	ALARM AT OFF-SITE REPORTING	ACTIVATE A PANEL	ACTIVATE VISUALS THROUGHOUT	ACTIVATE VOICE EVAC. THROUGHOUT	TROUBLE AT FACP	TROUBLE AT ANNUNCIATOR	TROUBLE AT OFF SITE REPORTING	SUPERVISORY AT FACP	SUPERVISORY AT ANNUNCIATOR	SUPERVISORY AT OFF SITE REPORTING	FAN SHUT DOWN	DEACTIVATE AUDIBLES	DEACTIVATE VISUALS	DEACTIVATE AUDIO/VISUALS	SYSTEM NORMAL	ELEVATOR RECALL TO DESIGNATED FLOOR	DOOR HOLDER RELEASE	SHUT FIRE/SMOKE BARRIERS	ELEVATOR POWER SHUNT TRIP	FLASH FIRE/ALT LIGHT IN ELEVATOR CAB	REMARKS
BEAM/SMOKE DETECTORS	•	•	•	•	•	•							•				•	•					
HEAT DETECTORS	•	•	•	•	•	•							•				•	•					
MANUAL PULL STATION	•	•	•	•	•	•											•						
SYSTEM RESET														•	•	•	•						
SIGNAL SILENCE														•									
AC POWER FAILURE							•	•	•														
FIRE ALARM TROUBLE (OPEN, SHORTS, OR GROUNDS) ON INITIATION OR SIGNALING CIRCUITS							•	•	•														

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 01-122444 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 02/11/2026

Peartree+Belli
ARCHITECTS
235 MONTEREY ST., SUITE B
SALINAS, CA 93901
(831) 424-4620
PEARTREEBELLI.COM

Aurum Consulting Engineers
Monterey Bay, Inc.
Project No. 24-299.00

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REGISTERED PROFESSIONAL ENGINEER
NAJIB ANWARY
No. E21043
EXP. 3/31/27
ELECTRICAL
STATE OF CALIFORNIA

FIRE ALARM SYMBOLS, ABBREV., EQUIPMENT LIST, OPERATIONAL MATRIX & NOTES

TRACK + FIELD REPLACEMENT AND NEW RESTROOM BUILDING FOR:

CHUALAR UNION E.S.
24285 LINCOLN ST. CHUALAR, CA 93925
CHUALAR UNION SCHOOL DISTRICT

REV.	DATE	DESCRIPTION
	06/22/25	1ST PLAN CHECK SUBMITTAL
	10/24/25	1ST PLAN CHECK RE-SUBMITTAL
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DATE: 05/15/2025
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SHEET: FA0.1

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BATTERY & VISUAL CIRCUIT VOLTAGE DROP CALCULATIONS

VISUAL CIRCUIT - V1a

DEVICE #	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
GAUGE WIRE	12	12	12	12	12	12	12	12	12	12
DISTANCE (FT)	15	20	40	0	0	0	0	0	0	0
AMPS OF DEVICE	0.035	0.018	0.018	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL AMPS @ DEV.	0.071	0.036	0.018	0	0	0	0	0	0	0
VOLT. DROP @ DEV.	0.0043	0.0029	0.0029	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
DEVICE #	11th	12th	13th	14th	15th	16th	17th	18th	19th	20th
GAUGE WIRE	12	12	12	12	12	12	12	12	12	12
DISTANCE (FT)	0	0	0	0	0	0	0	0	0	0
AMPS OF DEVICE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL AMPS @ DEV.	0	0	0	0	0	0	0	0	0	0
VOLT. DROP @ DEV.	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

TOTAL CIRCUIT AMPS =	**0.071**
TOTAL VOLT DROP =	**0.01007**
CKT VOLTAGE =	**20.4**
% VOLTAGE DROP =	**0.0%**

WIRE SIZE	RESIS. /M FT.	OHMS/ 1000
10	1.29	0.0013
12	2.01	0.0020
14	3.19	0.0032
16	5.08	0.0051

FORMULA:
I * FEET * 2*OHMS/1000

REMOTE POWER SUPPLY "RPS-R"

QTY	MODEL No.	DEVICE DESCRIPTION	STANDBY EACH	STANDBY TOTAL	ALARM EACH	ALARM TOTAL
1	HPF-PS6/10	NOTIFIER REMOTE POWER SUPPLY	0.1560	0.1560	0.1850	0.1850
1	V1a	VISUAL CIRCUIT #1	0.0000	0.0000	0.0710	0.0710
1	V1b	SPARE	0.0000	0.0000	0.0000	0.0000
1	V1c	SPARE	0.0000	0.0000	0.0000	0.0000
1	V1d	SPARE	0.0000	0.0000	0.0000	0.0000
1	V1e	SPARE	0.0000	0.0000	0.0000	0.0000
		PANEL STANDBY CURRENT		0.1560		
		PANEL ALARM CURRENT				0.2560

TOTAL SYSTEM CURRENT

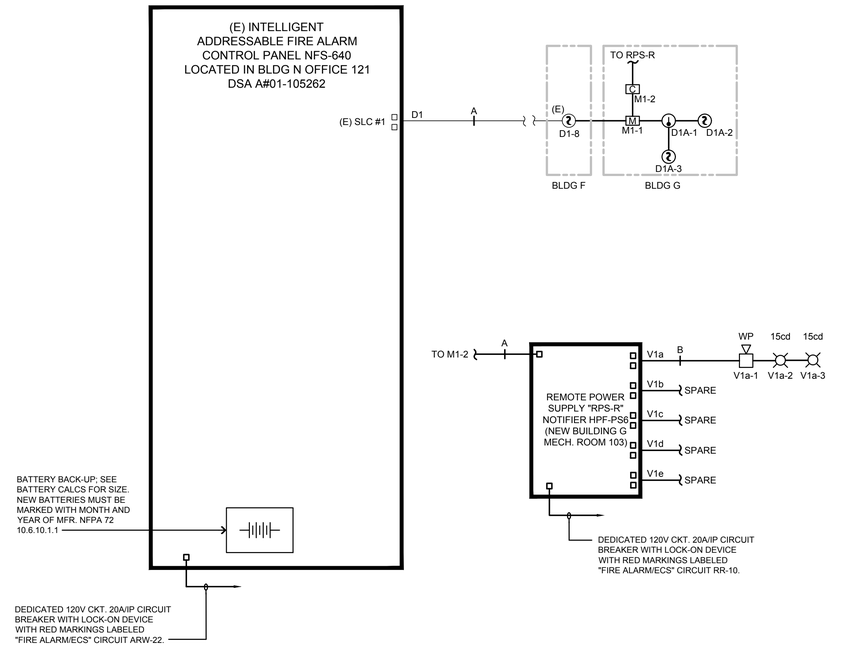
DESCRIPTION	STANDBY	ALARM
TOTAL STANDBY CURRENT (A)	0.1560	
X 60 HOUR STANDBY	9.3600	
TOTAL ALARM CURRENT (B)		0.2560
5 MINUTES OF ALARM (X .084)		0.0215
TOTAL BATTERY REQUIREMENT (A+B)		9.3815
SAFETY MARGIN (25%)		11.7269
BATTERY SUPPLIED (2) 12V		12AH

(E) FIRE ALARM CONTROL PANEL "FACP"

QTY	PRODUCT ID	DESCRIPTION	STANDBY EACH	STANDBY TOTAL	ALARM EACH	ALARM TOTAL
1	NFS-640	EXISTING CONNECTED DEVICES	0.2300	0.2300	0.2300	0.2300
1	UDACT-F	EXISTING UNIVERSAL DIGITAL ALARM COMMUNICATOR	0.0400	0.0400	0.1000	0.1000
2	LCD-80	EXISTING FIRE ALARM REMOTE ANNUNCIATOR	0.1000	0.2000	0.1000	0.2000
		PANEL STANDBY CURRENT		0.4700		
		PANEL ALARM CURRENT				0.5300

FIELD DEVICES

QTY	PRODUCT ID	DESCRIPTION	STANDBY EACH	STANDBY TOTAL	ALARM EACH	ALARM TOTAL
1	**FST-951**	**ADDRESSABLE PHOTOELECTRIC HEAT DETECTOR**	**0.0002**	**0.0002**	**0.0045**	**0.0045**
2	**FSP-951**	**ADDRESSABLE PHOTOELECTRIC SMOKE DETECTOR**	**0.0003**	**0.0006**	**0.0065**	**0.0130**
1	**FMM-1**	**ADDRESSABLE MONITOR MODULE**	**0.0008**	**0.0008**	**0.0065**	**0.0065**
1	**FCM-1**	**ADDRESSABLE CONTROL MODULE**	**0.0005**	**0.0005**	**0.0065**	**0.0065**
		EXISTING DEVICES		0.1310		1.8221
		DESCRIPTION		STANDBY		ALARM
		CONTROL PANEL		0.4700		0.5300
		FIELD DEVICES		0.1331		1.8526
		TOTAL STANDBY CURRENT		0.6031		
		X 60 HOUR STANDBY		36.1860		
		TOTAL ALARM CURRENT				2.3826
		5 MINUTES OF ALARM (X .084)				0.2001
		TOTAL BATTERY REQUIREMENT				36.3861
		SAFETY MARGIN (20%)				43.6634
		BATTERY SUPPLIED				(2) 12V 55AH



1 FIRE ALARM RISER DIAGRAM
NO SCALE

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 01-122444 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 02/11/2026

Peartree+Belli
ARCHITECTS
235 MONTEREY ST., SUITE B
SALINAS, CA 93901
(831) 424-4620
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Purdue Consulting Engineers
Monterey Bay, Inc.
Project No. 24-266.00
178 Main Street, Suite 204 • Los Gatos, CA 95030
(831) 688-3300 • FAX (831) 688-3301

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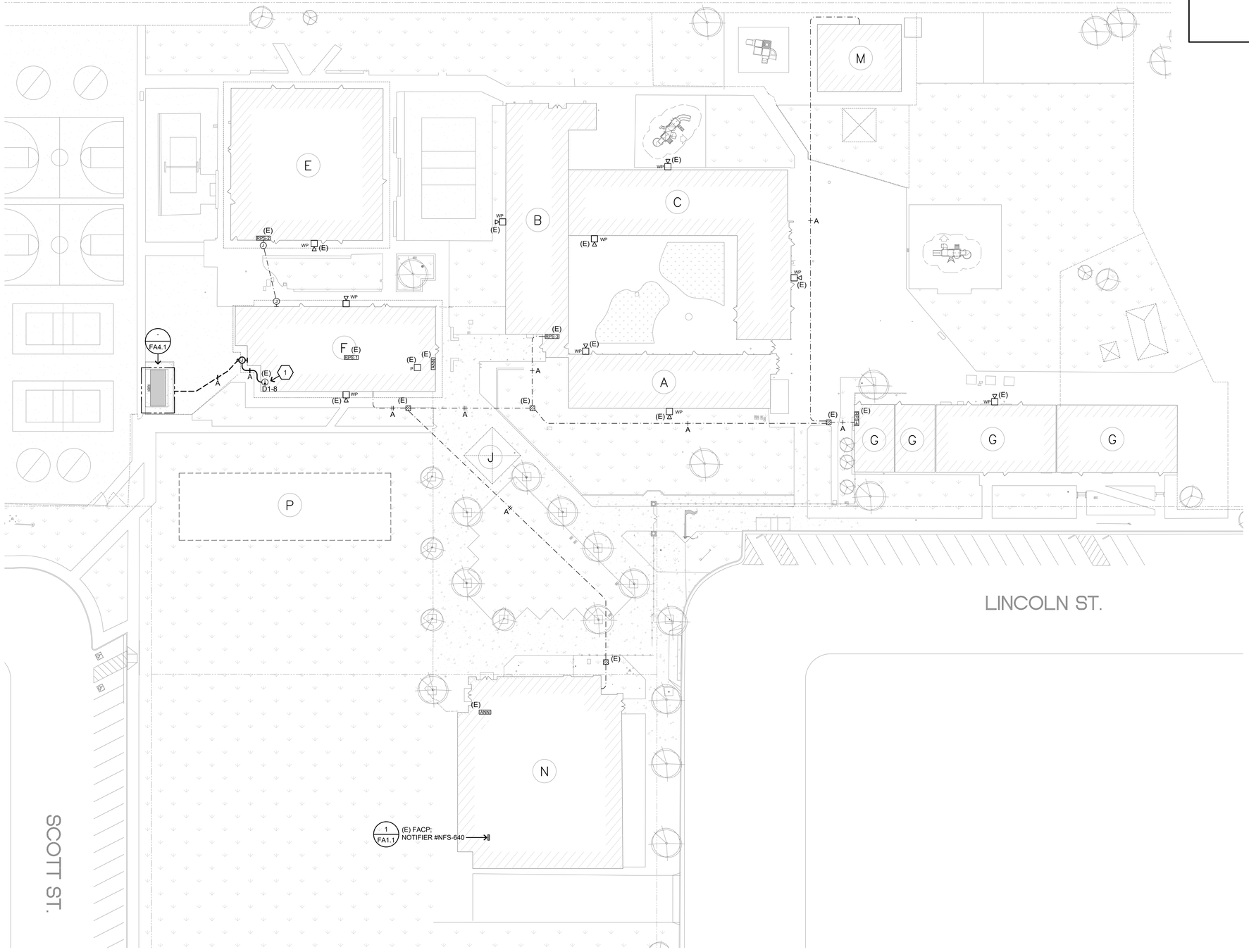
REGISTERED PROFESSIONAL ENGINEER
JUSTIN ANWAY
No. E21043
EXP. 3/31/27
ELECTRICAL
STATE OF CALIFORNIA

FIRE ALARM RISER DIAGRAM, BATTERY AND VOLTAGE DROP CALCULATIONS
TRACK + FIELD REPLACEMENT AND NEW RESTROOM BUILDING FOR:
CHUALAR UNION E.S.
24285 LINCOLN ST. CHUALAR, CA 93925
CHUALAR UNION SCHOOL DISTRICT

REV.	DATE	DESCRIPTION
	06/23/25	1ST PLAN CHECK SUBMITTAL
	10/24/25	1ST PLAN CHECK RE-SUBMITTAL
	01/21/26	2ND BACK CHECK RE-SUBMITTAL

DATE: 05/15/2025
SCALE: AS NOTED
DRAWN:
JOB: 24033
SHEET: FA1.1

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SHEET NOTES

1. EXTEND INITIATION CIRCUIT FROM (E) SMOKE DETECTOR LOCATED IN ELECTRICAL ROOM TO SYSTEMS TERMINATION CAN IN NEW BUILDING.

CABLE LEGEND

TYPE A = DENOTES INITIATING DETECTION CIRCUITS (SMOKE DETECTOR, HEAT DETECTOR, ETC.) UNLESS OTHERWISE NOTED. PROVIDE (1) #14 TWISTED-UNSHIELDED PAIR. CROSSHATCHES INDICATE THE NUMBER OF PAIRS.

GENERAL NOTES:

A. SEAL ALL EXTERIOR/INTERIOR BUILDING PENETRATIONS, CUT AND PATCH WALLS/CEILINGS FOR CONDUIT ROUTING AS NECESSARY. PAINT/FINISH EXPOSED CONDUITS/BOXES TO MATCH BUILDING FINISH. COORDINATE WITH DISTRICT & ARCHITECT FOR EXACT REQUIREMENTS.

B. CONTRACTOR SHALL PROVIDE & INSTALL TAMPER-RESISTANT TYPE RECEPTACLES FOR ALL GENERAL 20 AMP, 120V RECEPTACLES. ONLY RECEPTACLES TO BE MOUNTED/LOCATED AT +5'-6" A.F.F. AND FOR FIXED EQUIPMENT (WITH CORD & PLUG CONNECTION) ARE NOT REQUIRED TO BE OF TAMPER-RESISTANT TYPE.

C. CONTRACTOR SHALL ENSURE QUANTITY OF CONDUCTORS/CABLES INSTALLED IN CONDUITS DO NOT EXCEED 40% CONDUIT FILL (MAXIMUM) PER CEC SECTION 300.17.

30' 0' 15' 30'
SCALE: 1"=30'-0"

NORTH

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Puritan Consulting
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Project No. 24-299.00
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REGISTERED PROFESSIONAL ENGINEER
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ELECTRICAL
STATE OF CALIFORNIA

FIRE ALARM SITE PLAN

TRACK + FIELD REPLACEMENT AND NEW RESTROOM BUILDING FOR:

CHUALAR UNION E.S.

24285 LINCOLN ST. CHUALAR, CA 93925
CHUALAR UNION SCHOOL DISTRICT

REV.	DATE	DESCRIPTION
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	10/24/25	1ST PLAN CHECK RE-SUBMITTAL
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SHEET NOTES

1. PROVIDE AND INSTALL 12"W X 6" DEEP NEMA SYSTEMS TERMINATION CAN (STC) FOR FIRE ALARM CONDUIT & PA/SPEAKER CONDUIT ROUTING.
2. INSTALL LAMICOID NAMEPLATE ON FACE OF APPLIANCE READING "EOL INSIDE".

CABLE LEGEND

TYPE A = DENOTES INITIATING DETECTION CIRCUITS (SMOKE DETECTOR, HEAT DETECTOR, ETC.) UNLESS OTHERWISE NOTED, PROVIDE (1) #14 TWISTED-UNSHIELDED PAIR. CROSSHATCHES INDICATE THE NUMBER OF PAIRS.

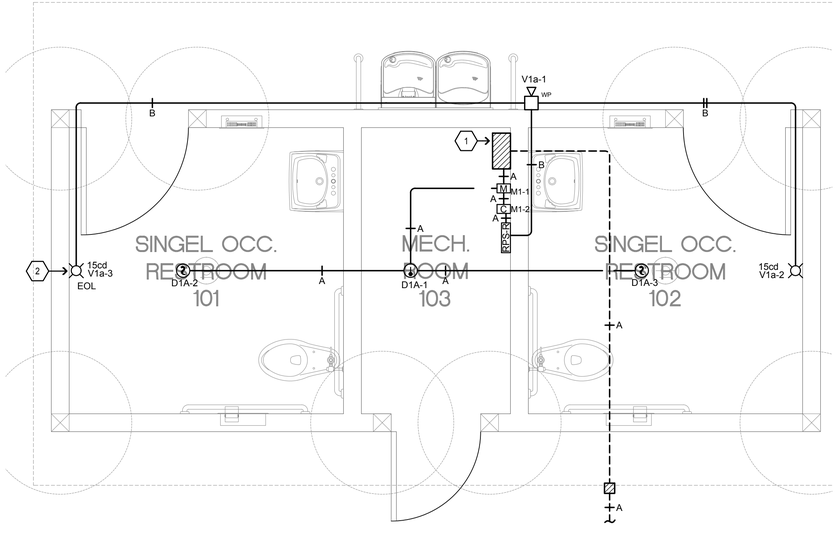
TYPE B = DENOTES VISUAL NOTIFICATION APPLIANCE CIRCUITS (STROBES & HORNS) UNLESS OTHERWISE NOTED, PROVIDE (1) PAIR OF #12 AWG. CROSSHATCHES INDICATE THE NUMBER OF PAIRS.

GENERAL NOTES:

A. SEAL ALL EXTERIOR/INTERIOR BUILDING PENETRATIONS, CUT AND PATCH WALLS/CEILINGS FOR CONDUIT ROUTING AS NECESSARY. PAINT/FINISH EXPOSED CONDUITS/BOXES TO MATCH BUILDING FINISH. COORDINATE WITH DISTRICT & ARCHITECT FOR EXACT REQUIREMENTS.

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C. CONTRACTOR SHALL ENSURE QUANTITY OF CONDUCTORS/CABLES INSTALLED IN CONDUITS DO NOT EXCEED 40% CONDUIT FILL (MAXIMUM) PER CEC SECTION 300.17.



1 FIRE ALARM PLAN
SCALE: 1/2"=1'-0"

2' 0' 1' 2'

NORTH

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ELECTRICAL
STATE OF CALIFORNIA

FIRE ALARM PLAN

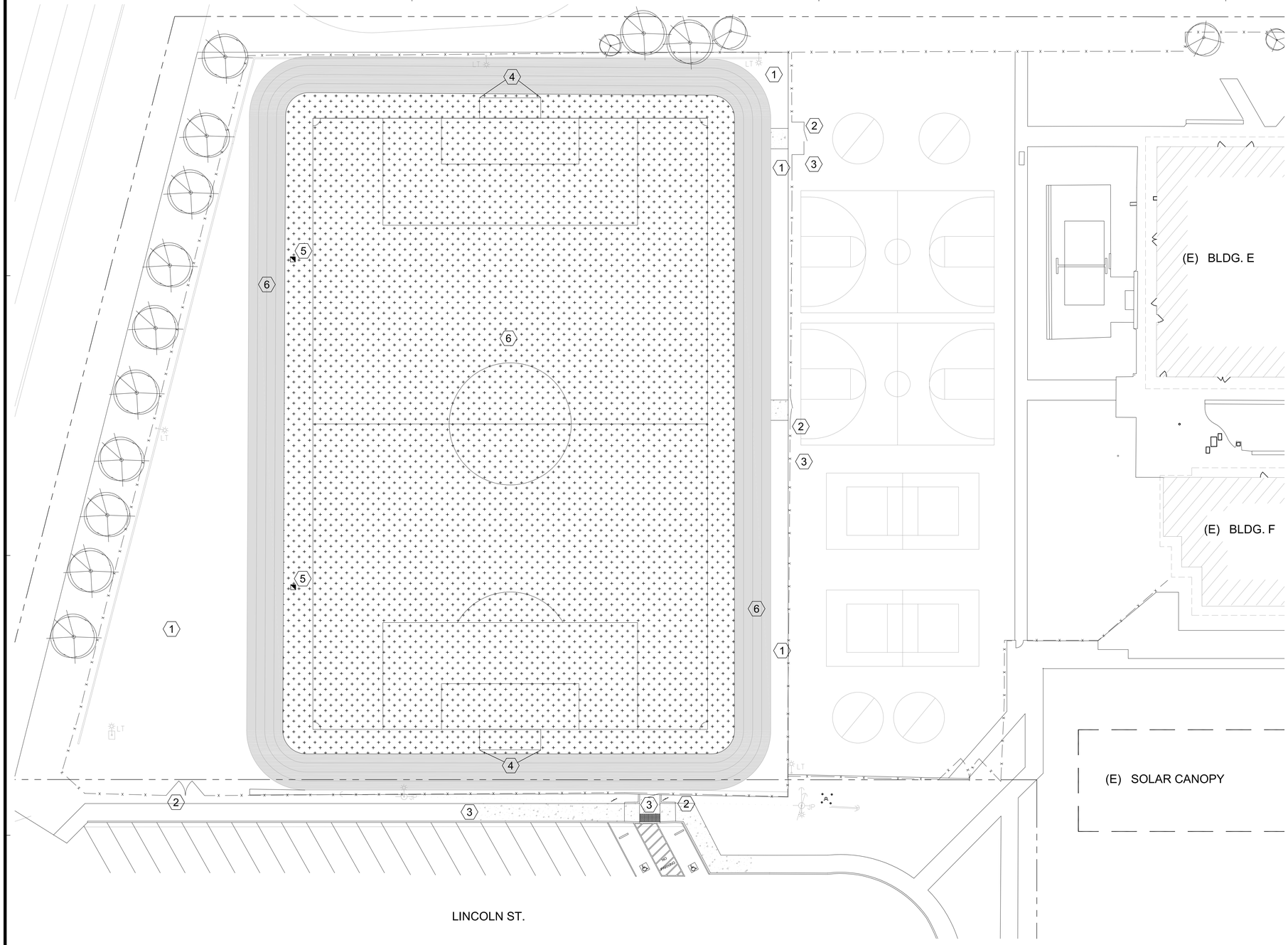
TRACK + FIELD REPLACEMENT AND NEW RESTROOM BUILDING FOR:

CHUALAR UNION E.S.
24285 LINCOLN ST. CHUALAR, CA 93925
CHUALAR UNION SCHOOL DISTRICT

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DRAWN:
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SHEET: FA4.1

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LEGEND

Existing Synthetic Turf: Remove and demolish existing turf, infill, and performance pad. See also General Notes below.

Existing Track: Demolish existing track surfacing and paving. Demolish existing inside wood header.

REFERENCE NOTES

1. Existing planting/lawn area: Preserve and protect. See General Notes.
2. Existing fencing and/or gate: Preserve and protect.
3. Existing paving: Preserve and protect.
4. Existing soccer goal anchor boxes: Preserve and protect boxes. Demolish existing turf on boxes. See Construction Plan for new work.
5. Existing irrigation quick coupler boxes: Demolish boxes and existing turf on boxes. See Construction Plan for new work.
6. Existing baserock under track and field: Preserve and protect in place.

GENERAL NOTES

1. Verify existing conditions and location of all utilities in field.
2. All items not indicated be demolished are to be preserved and protected. See Demolition Specs for additional information.
3. The Contractor shall protect the existing perimeter paving throughout the entire project. Any damage caused during the project shall be repaired and replaced at the Contractor's expense.
4. See Construction Plan and Specifications for new work.
5. Verify condition and depth of existing baserock under the turf and track paving.

SCALE: 1"= 20'-0"
0 20

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LANCE W. FOSTER
No. 5141
STATE OF CALIFORNIA

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TRACK AND FIELD DEMOLITION PLAN

TRACK + FIELD REPLACEMENT AND NEW RESTROOM BUILDING FOR:

CHUALAR UNION E.S.

24285 LINCOLN ST. CHUALAR, CA 93925
CHUALAR UNION SCHOOL DISTRICT

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SCALE: 1"= 20'-0"

0 20

LEGEND

- Synthetic Turf Field: See Specifications and (1/L-3.1)
- Synthetic Track Surfacing over AC Paving: See Specifications and (4/L-3.1)
- Existing Quick Coupler and New box: See (6/L-3.1)

REFERENCE NOTES

1. Existing soccer goal anchor boxes: See (7/L-3.1)
2. New Restroom Building: See Architectural Plans.
3. New field striping layout to match existing.
4. New inside track curb: See (3/L-3.1)
5. New outside track curb: See (5/L-3.1)
6. Provide lane striping and track name to match existing.

GENERAL NOTES

1. The Contractor shall protect the existing perimeter paving, and edge conditions throughout the entire project. Any damage caused during the project shall be repaired and replaced at the Contractor's expense.
2. The Contractor shall provide Track Surfacing submittals (cut sheets, colors, samples, and layout/striping shop drawings) for approval prior to any track surfacing work.
3. The Contractor shall provide shop drawings of new track and field striping layouts, to match existing.
4. Finish grade and recompact the existing turf field base and use leveling fines (per specifications) to fill in any low areas.
5. Scarify and re-compact the existing baserock under the new track area. Install the new track AC paving in lifts per specifications.

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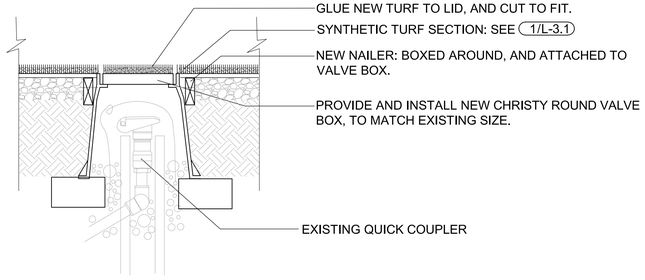
TRACK AND FIELD CONSTRUCTION PLAN
TRACK + FIELD REPLACEMENT AND NEW RESTROOM BUILDING FOR:
CHUALAR UNION E.S.
24285 LINCOLN ST. CHUALAR, CA 93925
CHUALAR UNION SCHOOL DISTRICT

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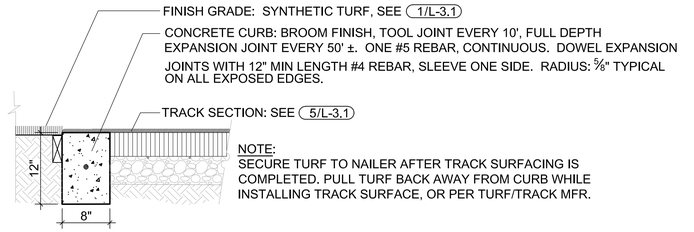
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SHEET: L-2.1

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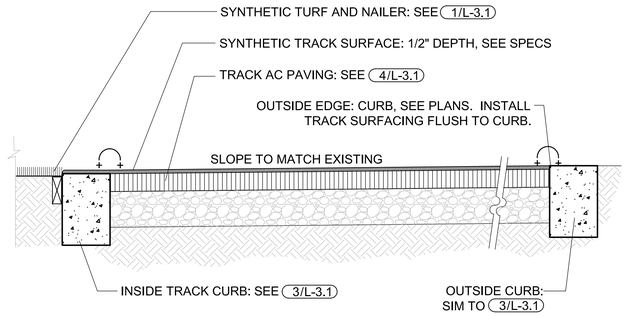
6 Quick Coupler Box in Field
NTS



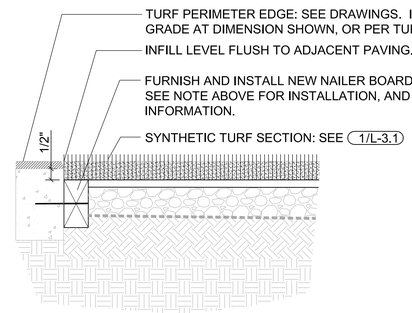
NOTE:
SECURE TURF TO NAILER AFTER TRACK SURFACING IS COMPLETED. PULL TURF BACK AWAY FROM CURB WHILE INSTALLING TRACK SURFACE, OR PER TURF/TRACK MFR.

3 Inside Track Curb
1" = 1'-0"

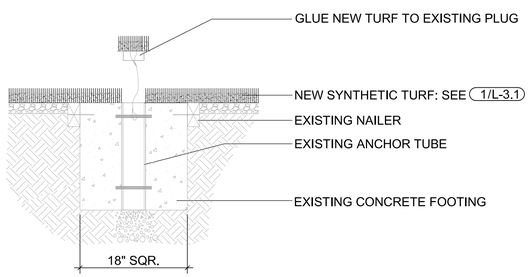
NAILER BOARD INSTALLATION:
THE BOARD SHALL BE INSTALLED TO THE CONC CURB WITH HEAVY DUTY TAPCON CONCRETE SCREW ANCHORS, AT 24" ON CENTER, AND AT 6" OFF EACH END. 3" LONG SCREWS, EMBEDDED MIN 1.5" INTO CONCRETE. CORE DRILL INTO CURB AND TIGHTEN TO THE BOARD PER MFR. MAINTAIN ½"-1" GAP BETWEEN CONSECUTIVE BOARDS FOR EXPANSION. THE NAILER BOARD SHALL BE INSTALLED ON THE ENTIRE EXISTING PERIMETER EDGES OF NEW SYNTHETIC TURF.



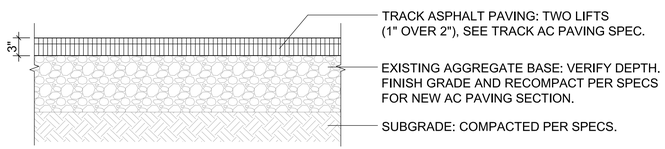
5 Track Section
1" = 1'-0"



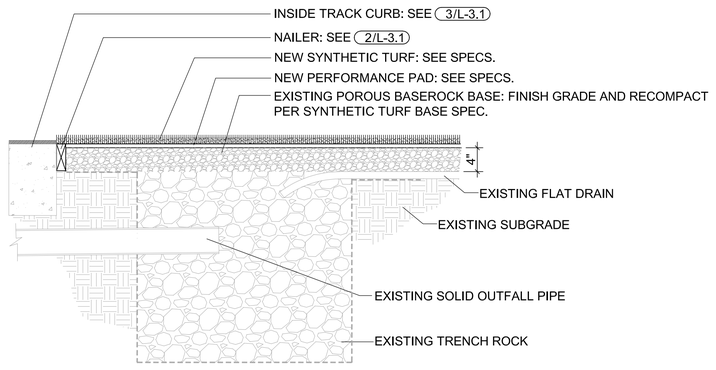
2 Synthetic Turf Nailer
NTS



7 Existing Soccer Goal Anchor
NTS



4 Track Asphalt Paving
1" = 1'-0"



1 Synthetic Turf
1" = 1'-0"

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LICENSED LANDSCAPE ARCHITECT
LANCE W. FOSTER
No. 5181
RENEWAL 08/31/2027
STATE OF CALIFORNIA

TRACK & FIELD CONSTRUCTION DETAILS
TRACK + FIELD REPLACEMENT AND NEW RESTROOM BUILDING FOR:
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CHUALAR UNION SCHOOL DISTRICT

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JOB: 24033
SHEET: L-3.1

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DSA

103-22

LIST OF STRUCTURAL TESTS AND SPECIAL INSPECTIONS

☑ Project has a geotechnical report or construction documents require special inspection by a geotechnical engineer.
☐ Project does NOT have and does NOT require a geotechnical report.

	TYPE	BY
S1 | SOILS - GENERAL		
☑ S1a: Site Preparation	Periodic	GE
S2 | COMPACTION AND FILL		
☑ S2a: Fill Materials	Test	LOR*
☑ S2b: Fill Placement	Continuous	GE*
☑ S2c: Compaction	Test	LOR*
S3 | DRIVEN DEEP FOUNDATIONS (PILES)		
☐ S3a: Materials and Members	Continuous	GE*
☐ S3b: Pile Capacity	Test	LOR*
☐ S3c: Driving Operations	Continuous	GE*
☐ S3d: Pile Installation	Continuous	GE*
☐ S3e: Specialty Piles	*	*
S4 | CAST-IN-PLACE DEEP FOUNDATIONS (PIERS)		
☐ S4a: Drilling Operations	Continuous	GE*
☐ S4b: Pier Construction	Continuous	GE*
☐ S4c: Bearing Strata	Continuous	GE*
S5 | RETAINING WALLS		
☐ S5a: Backfill Placement	Continuous	GE*
☐ S5b: Soil Reinf. and Drainage	Continuous	GE*
☐ S5c: Segmental Retaining Walls	Continuous	GE*
S6 | OTHER SOILS		
☐ S6a: Soil Improvement Test	Test	GE*
☐ S6b: Soil Improvement Inspection	Continuous	GE*
☐ S6c: Not used.	N/A	N/A
☐ S6d: Not used.	N/A	N/A
☐ S6e: Not used.	N/A	N/A
☐ S6f: Not used.	N/A	N/A
☐ S6g: Not used.	N/A	N/A
☐ S6h: Not used.	N/A	N/A
☐ S6i: Not used.	N/A	N/A
☐ S6j: Not used.	N/A	N/A
☐ S6k: Not used.	N/A	N/A
☐ S6l: Not used.	N/A	N/A
☐ S6m: Not used.	N/A	N/A
☐ S6n: Not used.	N/A	N/A

* See Appendix for additional information.

	TYPE	BY
C1 | CAST-IN-PLACE CONCRETE		
☑ C1a: Mix Design	Continuous	SI
☑ C1b: Reinforcing Steel	Test	LOR
☑ C1c: Concrete Material	Test	LOR
☑ C1d: Strength Test	Test	LOR
☑ C1e: Batch Plant Inspection	Continuous	SI
C2 | PRESTRESSED CONCRETE		
☐ C2a: Tendons and Anchorage	Test	LOR
☐ C2b: Tendon Placement	Periodic	SI
☐ C2c: Concrete Strength	Periodic	SI
☐ C2d: Stressing Operations	Continuous	SI
C3 | PRECAST CONCRETE		
☐ C3a: General Fabrication	Continuous	SI
☐ C3b: General Erection	Periodic	SI*
☐ C3c: Diaphragm Connections	Continuous	SI
☐ C3d: Diaphragm Tolerances	Periodic	SI
C4 | SHOTCRETE		
☐ C4a: Placement	Continuous	SI
☐ C4b: Shotcrete Material	Test	LOR
C5 | POST-INSTALLED ANCHORS		
☐ C5a: Inspection	See notes	SI*
☐ C5b: Test	Test	LOR
C6 | OTHER CONCRETE		
☐ C6a: Not used.	N/A	N/A
☐ C6b: Not used.	N/A	N/A
☐ C6c: Not used.	N/A	N/A
☐ C6d: Not used.	N/A	N/A
☐ C6e: Not used.	N/A	N/A
☐ C6f: Not used.	N/A	N/A
☐ C6g: Not used.	N/A	N/A
☐ C6h: Not used.	N/A	N/A
☐ C6i: Not used.	N/A	N/A
☐ C6k: Not used.	N/A	N/A
☐ C6l: Not used.		
Not used.		

* See Appendix for additional information.

Project Name: **Chualar Union Elementary School** Application No.: **01-122444** Increment:
School District: **Chualar Union School District** File No.: **27-13**

LIST OF STRUCTURAL TESTS AND SPECIAL INSPECTIONS

	TYPE	BY
M1 | STRUCTURAL MASONRY f'm PSI:		
☐ M1a: Mill Certificates - Reinf.	Periodic	SI*
☐ M1b: Material Certificates	Test	LOR
☐ M1c: Strength Test	Test	LOR
☐ M1d: Mortar Proportions	Periodic	SI
☐ M1e: Grout Proportions	Periodic	SI
☐ M1f: Batch Plant Inspection		SI
☐ M1g: Core Tests	Test	LOR
☐ M1h: Prisms	Continuous	SI
☐ M1i: Dowels and Supports	Periodic	SI
☐ M1j: Reinforcement and Members	Periodic	SI
☐ M1k: Reinforcement Placement	Continuous	SI
☐ M1l: Grout Placement	Continsuous	SI
☐ M1m: Unit Layup and Joints	Periodic	SI*
☐ M1n: Cold/Hot Weather Work	Periodic	SI
☐ M1o: Anchors and Embeds	Continuous	SI
☐ M1p: Grout Cavity	Continuous	SI
M2 | VENEER OR GLASS BLOCK PARTITIONS		
☐ M2a: Mortar and Grout	Periodic	SI
☐ M2b: Unit Layup and Joints	Periodic	SI
☐ M2c: Wires and Connector	Periodic	SI
☐ M2d: Anchors and Embeds	Periodic	SI
☐ M2e: Cold/Hot Weather Work	Periodic	SI*
☐ M2f: Adhered Veneer Bond	Test	LOR
M3 | POST-INSTALLED ANCHORS		
☐ M3a: Inspection	Varies*	SI*
☐ M3b: Test	Test	LOR
M4 | OTHER MASONRY		
☐ M4a: Not used.	N/A	N/A
☐ M4b: Not used.	N/A	N/A
☐ M4c: Not used.	N/A	N/A
☐ M4d: Not used.	N/A	N/A
☐ M4e: Not used.	N/A	N/A
☐ M4f: Not used.	N/A	N/A
☐ M4g: Not used.	N/A	N/A
☐ M4h: Not used.	N/A	N/A
☐ M4i: Not used.	N/A	N/A
☐ M4j: Not used.	N/A	N/A
☐ M4k: Not used.		
☐ M4l: Not used.		
☐ M4m: Not used.		
* See Appendix for additional information.		

	TYPE	BY
S/A1 | STEEL AND ALUMINUM		
☑ S/A1a: Material Identification	Periodic	*
☑ S/A1b: Unidentified Material	Test	LOR
☑ S/A1c: Steel Fabrication	Periodic	SI
☐ S/A1d: Buckling Restrained Brace	Test*	LOR
S/A2 | HIGH-STRENGTH BOLTS		
☐ S/A2a: Product Verification	Periodic	SI
☐ S/A2b: Bolts, Nuts, and Washers	Test	LOR
☐ S/A2c: Snug Tight	Periodic	SI
☐ S/A2d: Pretensioned / Slip-Critical	*	SI
S/A3 | WELDING		
☑ S/A3a: Weld Material	Periodic	SI
☑ S/A3b: Certificate of Compliance	Periodic	SI
☑ S/A3c: WPS and Qualifications	Periodic	SI
S/A4 | SHOP WELDING		
☐ S/A4a: Weld Category A	Continuous	SI
☐ S/A4b: Weld Category B	Periodic	SI
☐ S/A4c: Stairs and Railing	Periodic	SI
☐ S/A4d: Reinf. Steel Weldability	Periodic	SI
☐ S/A4e: Reinforcing Steel	Continuous	SI
S/A5 | FIELD WELDING		
☐ S/A5a: Weld Category A	Continuous	SI
☐ S/A5b: Weld Category B	Periodic	SI
☐ S/A5c: End Welded Studs	Periodic	SI
☐ S/A5d: Deck Welds	Periodic	SI
☐ S/A5e: Cold-Formed Steel	Periodic	SI
☐ S/A5f: Stairs and Railing	Periodic	SI
☐ S/A5g: Reinf. Steel Weldability	Periodic	SI
☐ S/A5h: Reinforcing Steel	Continuous	SI
S/A6 | NONDESTRUCTIVE TESTING		
☐ S/A6a: Ultrasonic	Test	LOR
☐ S/A6b: Magnetic Particle	Test	LOR
☐ S/A6c:Not used.	N/A	N/A
☐ S/A6d:Not used.	N/A	N/A
☐ S/A6e:Not used.	N/A	N/A
S/A7 | STEEL JOISTS AND TRUSSES		
☐ S/A7a: Fabrication	Continuous	SI
S/A8 | SPRAYED FIRE-RESISTANT MATERIALS		
☐ S/A8a: Surface and Installation	Periodic	SI
☐ S/A8b: Density	Test	LOR
☐ S/A8c: Bond: Adhesion/Cohesion	Test	LOR
* See Appendix for additional information.		

Project Name: **Chualar Union Elementary School** Application No.: **01-122444** Increment:
School District: **Chualar Union School District** File No.: **27-13**

LIST OF STRUCTURAL TESTS AND SPECIAL INSPECTIONS

	TYPE	BY
S/A9 | ANCHOR BOLTS AND ANCHOR RODS		
☑ S/A9a: Anchor Rods and Bolts	Test	LOR
☐ S/A9b: Other Threaded Rods	Test	LOR
S/A10 | STORAGE RACK SYSTEMS		
☐ S/A10a: Material Verification	Periodic	SI
☐ S/A10b: Fabrication	Periodic	SI
☐ S/A10c: Anchorage	Periodic	SI
☐ S/A10d: Completed System	Periodic	SI*
S/A11 | OTHER STEEL AND ALUMINUM		
☐ S/A11a: Not used.	N/A	N/A
☐ S/A11b: Not used.	N/A	N/A
☐ S/A11c: Not used.	N/A	N/A
☐ S/A11d: Not used.	N/A	N/A
☐ S/A11e: Not used.	N/A	N/A
☐ S/A11f: Not used.	N/A	N/A
☐ S/A11g: Not used.	N/A	N/A
☐ S/A11h: Not used.	N/A	N/A
☐ S/A11i: Not used.	N/A	N/A
☐ S/A11j: Not used.	N/A	N/A
W1 | PREFABRICATED WOOD TRUSSES		
☐ W1a: Open Web Truss Fabrication	Continuous	SI
☐ W1b: Metal Plate Truss Fabrication	Continuous	SI
W2 | MANUFACTURED WOOD ELEMENTS		
☐ W2a: GL Timber Fabrication	Continuous	SI
☐ W2b: CLT Fabrication	Continuous	SI
☐ W2c: Mass Timber Erection	Periodic	SI
☐ W2d: Connections Type A	Periodic	SI
☐ W2e: Connections Type B	Continuous	SI
☐ W2f: Sealants	Periodic	SI
W3 | OTHER WOOD		
☐ W3a: Not used.	N/A	N/A
☐ W3b: Not used.	N/A	N/A
☐ W3c: Not used.	N/A	N/A
☐ W3d: Not used.	N/A	N/A
☐ W3e: Not used.	N/A	N/A
☐ W3f: Not used.	N/A	N/A
☐ W3g: Not used.	N/A	N/A
☐ W3h: Not used.	N/A	N/A

* See Appendix for additional information.

	TYPE	BY
X | OTHER		
☐ X01: Product Load Test*	Test	LOR
☐ X02: Non-HSB Installation Torque	Continuous	SI*
☐ X03: Not used.	N/A	N/A
☐ X04: Not used.	N/A	N/A
☐ X05: Not used.	N/A	N/A
☐ X06: Not used.	N/A	N/A
☐ X07: Not used.	N/A	N/A
☐ X08: Not used.	N/A	N/A
☐ X09: Not used.	N/A	N/A
☐ X10: Not used.	N/A	N/A

EXEMPTIONS

Those items identified on the DSA-approved construction documents with a note indicating they are not part of the DSA approval or those items checked below are exempt from test and special inspection requirements. The project inspector shall verify all construction complies with the approved construction documents.

- ☐ Soils: Eligible shallow foundation elements**.
- ☐ Soils: Eligible deep foundation elements - type 1**.
- ☐ Soils: Eligible deep foundation elements - type 2**.
- ☐ Concrete/Masonry: Eligible post-installed anchors**.
- ☐ Concrete: Batch plant inspection for items listed in and complying with CBC Section 1705A.3.3.2.
- ☐ Concrete: Epoxy shear dowels in nonstructural slab-on-grade per CBC Section 1910A.5.4, Exception #4.
- ☐ Concrete/Masonry: Reinforcing bar testing for items listed in and complying with CBC Section 1910A.2.
- ☐ Masonry: Freestanding site walls and retaining walls per DSA IR 21-1.
- ☐ Concrete: Eligible precast elements**.
- ☐ Welding: Eligible fences and gates**.
- ☐ Welding: Eligible railing and ramps**.
- ☐ Welding: Eligible interior cold-formed steel framing**.
- ☐ Welding: Eligible equipment curbs**.
- ☐ Welding: Eligible components supporting MEP distribution systems**.
- ☐ Welding: Eligible mounts and recreational equipment**.
- ☐ Welding: Eligible nonstructural components**.

** See Appendix for eligibility requirements.

Project Name: **Chualar Union Elementary School** Application No.: **01-122444** Increment:
School District: **Chualar Union School District** File No.: **27-13**

LIST OF STRUCTURAL TESTS AND SPECIAL INSPECTIONS

IMPORTANT: This form is only a summary list of structural tests and some of the special inspections required for the project. Any items indicated on the approved construction documents with a note stating that the items are not part of the DSA approval are not considered in this form. Generally, the structural tests and special inspections noted on this form are those that will be performed by the Geotechnical Engineer of Record, Laboratory of Record, or Special Inspector. The actual complete test and inspection program must be performed as detailed on the DSA approved documents. The exemption appendix at the end of this form identifies work NOT subject to DSA requirements for special inspection or structural testing. The project inspector is responsible for providing inspection of all facets of construction, including but not limited to, special inspections not listed on this form such as structural wood framing, high-load wood diaphragms, cold-formed steel framing, anchorage of nonstructural components, etc., per Title 24, Part 2, Chapter 17A.

Legend to TYPE and BY Columns:

Continuous - Indicates continuous special inspection is required.

Periodic - Indicates periodic special inspection is required.

Test - Indicates a test is required.

GE – Indicates special inspection shall be performed by a registered geotechnical engineer or his/her authorized representative, usually associated with the Laboratory of Record.

LOR – Indicates test or special inspection shall be performed by a testing laboratory accepted in the DSA Laboratory Evaluation and Acceptance (LEA) Program (i.e., the Laboratory of Record for the project). See CAC Section 4-335.

PI - Indicates special inspection may be performed by a project inspector when specifically approved by DSA.

SI - Indicates special inspection shall be performed by an appropriately qualified/approved special inspector.

Required Verified Reports:

1. Soils Testing and Inspection: Form DSA 293
2. Structural Testing and Inspection: Form DSA 291
3. Concrete Batch Plant Inspection: Form DSA 291
4. Shop Welding Inspection: Form DSA 291 or DSA 292

Verified reports are required on the following DSA forms:

DSA 291: Laboratory of Record Verified Report

DSA 292: Special Inspectors Employed Directly by the District Verified Report

DSA 293: Geotechnical Verified Report

Note: To facilitate DSA electronic mark-ups and identification stamp application, DSA recommends against using secured electronic or digital signatures.

Name of Design Professional in General Responsible Charge:

David Peartree

Name of Structural Engineer of Record (when applicable):

Nathaniel B. White

Signature of Architect or Structural Engineer: **Date:**

01/21/2026

DSA STAMP

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 01-122444 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 02/11/2026

Project Name: **Chualar Union Elementary School**
School District: **Chualar Union School District**

Application No.: **01-122444** Increment:
File No.: **27-13**

Appendix: LIST OF STRUCTURAL TESTS AND SPECIAL INSPECTIONS

NOTE: Undefined sections and table references found in this appendix are from the CBC, or California Building Code

S1. GENERAL:	
Test or Special Inspection	**Code References and Notes**
S1a: Site Preparation | Verify that: • Site has been prepared properly prior to placement of controlled fill and/or excavations for foundations. • Foundation excavations are extended to proper depth and have reached proper material. • Materials below footings are adequate to achieve the design bearing capacity.	* By geotechnical engineer or his or her qualified representative. (See Appendix (end of this form) form for exemptions.)

S2. SOIL COMPACTION AND FILL:	
Test or Special Inspection	**Code References and Notes**
S2a: Fill Materials | Perform classification and testing of fill materials.	* Under the supervision of the geotechnical engineer.
S2b: Fill Placement | Verify use of proper materials, densities and inspect lift thicknesses, placement and compaction during placement of fill.	* By geotechnical engineer or his or her qualified representative. (Refer to specific items identified in the Appendix (end of this form) form for exemptions where soils SI and testing may be conducted under the supervision of a geotechnical engineer or LOR's engineering manager. In such cases, the LOR's form DSA 291 shall satisfy the soil SI and test reporting requirements for the exempt items.)
S2c: Compaction | Compaction testing.	* Under the supervision of the geotechnical engineer. (Refer to specific items identified in the Appendix (end of this form) for exemptions where soils testing may be conducted under the supervision of a geotechnical engineer or LOR's engineering manager. In such cases, the LOR's form DSA 291 shall satisfy the soil test reporting requirements for the exempt items.)

S3. DRIVEN DEEP FOUNDATIONS (PILES):	
Test or Special Inspection	**Code References and Notes**
S3a: Materials and Members | Verify pile materials, sizes and lengths comply with the requirements.	* By geotechnical engineer or his or her qualified representative.
S3b: Pile Capacity | Determine capacities of test piles and conduct additional load tests as required.	* Under the supervision of the geotechnical engineer.
S3c: Driving Operations | Inspect driving operations and maintain complete and accurate records for each pile.	* By geotechnical engineer or his or her qualified representative.

S3d: Pile Installation | Verify locations of piles and their plumbness, confirm type and size of hammer, record number of blows per foot of penetration, determine required penetrations to achieve design capacity, record tip and butt elevations and record any pile damage.	* By geotechnical engineer or his or her qualified representative.
S3e: Specialty Piles | For specialty piles, perform additional inspections as determined by the registered design professional in responsible charge.	* As defined on drawings or specifications.

S4. CAST-IN-PLACE DEEP FOUNDATIONS (PIERS):	
Test or Special Inspection	**Code References and Note**
S4a: Drilling Operations | Inspect drilling operations and maintain complete and accurate records for each pier.	* By geotechnical engineer or his or her qualified representative. (See Appendix (end of this form) for exemptions.)
S4b: Pier Construction | Verify pier locations, diameters, plumbness, bell diameters (if applicable), lengths and embedment into bedrock (if applicable); record concrete or grout volumes.	* By geotechnical engineer or his or her qualified representative. (See Appendix (end of this form) for exemptions.)
S4c: Bearing Strata | Confirm adequate end strata bearing capacity.	* By geotechnical engineer or his or her qualified representative. (See Appendix (end of this form) for exemptions.)

S5. RETAINING WALLS:	
Test or Special Inspection	**Code References and Notes**
S5a: Backfill Placement | Placement, compaction and inspection of backfill.	1705A.6.1. * By geotechnical engineer or his or her qualified representative. (See section S2 above).
S5b: Soil Reinf. and Drainage | Placement of soil reinforcement and/or drainage devices.	* By geotechnical engineer or his or her qualified representative.
S5c: Segmental Retaining Walls | Segmental retaining walls; inspect placement of units, dowels, connectors, etc.	* By geotechnical engineer or his or her qualified representative. See DSA IR 18-2.

S6 | OTHER SOILS	
Test or Special Inspection	**Code References and Notes**
S6a | Soil Improvements	Submit a comprehensive report documenting final soil improvements constructed, construction observation and the results of the confirmation testing and analysis to CGS (California Geological Survey) for final acceptance. * By geotechnical engineer or his or her qualified representative.
S6b | Inspection of Soil Improvements	* By geotechnical engineer or his or her qualified representative.
S6c. | Not used.	N/A
S6d. | Not used.	N/A
S6e. | Not used.	N/A
S6f. | Not used.	N/A
S6g. | Not used.	N/A
S6h. | Not used.	N/A
S6i. | Not used.	N/A
S6j. | Not used.	N/A
S6k. | Not used.	N/A
S6l. | Not used.	N/A
S6m. | Not used.	N/A
S6n. | Not used.	N/A

C1. CAST-IN-PLACE CONCRETE	
Test or Special Inspection	**Code References and Notes**
C1a: Mix Design | Verify use of required design mix.	**Table 1705A.3 Item 5, 1903A.5, 1903A.7, 1904A.1, 1904A.2, 1910A.1 ; ACI 318 Ch. 19, 26.4, 26.13.3.2.**
C1b: Reinforcing Steel | Identify, sample, and test reinforcing steel.	**Table 1705A.3 Item 1, 1705A.3.9, 1908A.1, 1910A.2; ACI 318 Ch. 20 and Sections 25.2, 25.3, 25.5.1, 26.6.1; DSA IR 17-10 and BU 24-02. (See Appendix (end of this form) for exemptions.)**
C1c: Concrete Material | During concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	**Table 1705A.3 Item 6, 1705A.3.9, 1905A.1.17; ASTM C31, ASTM C172; ACI 318 Sections 26.4, 26.5 & 26.12.**
C1d: Strength Test | Test concrete (f'c).	**1905A.1.17; ACI 318 Section 26.12.**
C1e: Batch Plant Inspection | Batch plant inspection: Continuous	**Default of "Continuous" per 1705A.3.3. If approved by DSA, batch plant inspection may be reduced to "Periodic" subject to requirements in Section 1705A.3.3.1, or not required per 1705A.3.3.2. See IR 17-13. (See Appendix (end of this form) for exemptions.)**

C2. PRESTRESSED / POST-TENSIONED CONCRETE (IN ADDITION TO SECTION C1):	
Test or Special Inspection	**Code References and Notes**
C2a: Tendons and Anchorage | Sample and test prestressing tendons and anchorages.	**1705A.3.4 Table 1705A.3 Item 1, 1910A.3; ACI 318 Ch. 20 and Sections 25.2, 26.6.1.**
C2b: Tendon Placement | Inspect placement of prestressing tendons.	**1705A.3.4, Table 1705A.3 Items 1 & 9; ACI 318 Ch. 20 and Sections 25.2, 26.6.1-26.6.3.**
C2c: Concrete Strength | Verify in-situ concrete strength prior to stressing of post-tensioning tendons.	**Table 1705A.3 Item 13; ACI 318 Sections 26.10.2, 26.11.2, 26.13.3.3. Special inspector to verify specified concrete strength test prior to stressing.**
C2d: Stressing Operations | Inspect application of post-tensioning or prestressing forces and grouting of bonded prestressing tendons.	**1705A.3.4, Table 1705A.3 Item 9; ACI 318 Sections 26.10.2, 26.13.1, 26.13.3.2.**

C3. PRECAST CONCRETE (IN ADDITION TO SECTION C1):	
Test or Special Inspection	**Code References and Notes**
C3a: General Fabrication | 1. Inspect fabrication of precast concrete members. * 2. Inspect reinforcement of the following precast concrete elements or system(s): a. special moment frames. b. boundary elements of special structural walls. c. coupling beams.	**1705A.3 Item 1, 7.** See Appendix for exemptions. *May be periodic where fabrication occurs in a PCI-certified plant. For underground structures, NPCA plant certification is acceptable. PCI MNL-116-21; PCI MNL-117-13; NPCA Quality Control Manual (QCM) 17th Edition. See IR A-15.

C3b: General Erection | Inspect erection of precast concrete members.	**Table 1705A.3 Item 10**.
C3c: Diaphragm Connections | For precast concrete diaphragm connections or reinforcement at joints classified as moderate or high deformability elements (MDE or HDE) in structures assigned to Seismic Design Category D, E or F, inspect such connections and reinforcement in the field for: 1. Installation of the embedded parts. 2. Completion of the continuity of reinforcement across joints. 3. Completion of connections in the field.	**Table 1705A.3 Item 11**.
C3d: Diaphragm Tolerances | Inspect installation tolerances of precast concrete diaphragm connections for compliance with ACI 550.5.	**Table 1705A.3 Item 12**

C4. SHOTCRETE (IN ADDITION TO SECTION C1):	
Test or Special Inspection	**Code References and Notes**
C4a: Placement | Inspect shotcrete placement for proper application techniques.	**1705A.3.9, Table 1705A.3 Item 7, 1908A.1, 1908A.2, 1908A.3. See ACI 506.2 Section 3.4, and ACI 506R.**
C4b: Shotcrete Material | Sample and test shotcrete (f'_c).	**1908A.2 and 1705A.3.9.**

C5. POST-INSTALLED ANCHORS:	
Test or Special Inspection	**Code References and Notes**
C5a: Inspection | Inspect installation of post-installed anchors	**1617A.1.19, Table 1705A.3 Item 4a (Continuous) & 4b (Periodic), 1705A.3.8** (See Appendix (end of this form) for exemptions). ACI 318 Sections 26.7.2, 26.13.1, 26.13.3.2, 26.13.3.3. * May be performed by the project inspector when specifically approved by DSA.
C5b: Test | Test post-installed anchors.	**1910A.5.** (See Appendix (end of this form) for exemptions.)

C6. OTHER CONCRETE:	
Test or Special Inspection	**Code References and Notes**
C6a. | Not used.	N/A
C6b. | Not used.	N/A
C6c. | Not used.	N/A
C6d. | Not used.	N/A
C6e. | Not used.	N/A
C6f. | Not used.	N/A
C6g. | Not used.	N/A
C6h. | Not used.	N/A
C6i. | Not used.	N/A
C6j. | Not used.	N/A
C6k. | Not used.	Not used.
C6l. | Not used.	Not used.

Appendix: LIST OF STRUCTURAL TESTS AND SPECIAL INSPECTIONS

M1. STRUCTURAL MASONRY:	
Test or Special Inspection	**Code References and Notes**
M1a: Mill Certificates - Reinf. | Mill certificate indicates compliance with requirements for reinforcement, anchors, ties, fasteners and metal accessories. See item C1(b) for identification, sampling and testing of reinforcing steel.	**2103A.4**; TMS 602-16 Article 1.5B.2 & 2.4. * To be performed by qualified LOR representative. Applicable testing by LOR. See IR 17-10 for unidentified reinforcing steel.
M1b: Material Certificates | Producer's certificate of compliance for masonry units, mortar and grout materials.	**1705A.4, 2103A.2, 2103A.3, 2103A.5;** TMS 602 Articles 1.5B.2, 2.1, 2.2, 2.6A and 2.6B, and Table 6 footnote 3.
M1c: Strength Test | Test masonry (f'm).	**1705A.4. For Unit Strength: 2105A.3**; TMS 602 Articles 1.4B.2 ,1.5B.1 & 1.5B.2. **For Prism (required when f'_m > 2000 psi):2105A.2;** TMS 602 Articles 1.4B.3, 1.4B.4, 1.5B.1 & 1.5B.2.
M1d: Mortar Proportions | Verify proportions or properties of site-prepared, premixed or preblended mortar.	TMS 602, Table 3 (row 5), Table 4 Item 1a. DSA PR 20-01. (See Appendix (end of this form) for exemptions.)
M1e: Grout Proportions | Verify proportions or properties of site-prepared, premixed or preblended grout.	TMS 602, Table 3 (row 5), Table 4 Item 2d. (See Appendix (end of this form) for exemptions.)
M1f: Batch Plant Inspection | Batch plant inspection: Periodic	Default of **'Continuous'** per **1705A.3.3**. If approved by DSA, batch plant inspection may be reduced to **'Periodic'** subject to requirements in Section **1705A.3.3.1,** or not required per **1705A.3.3.2.** See IR 17-13. Refer to TMS 602 Table 3 and Table 4, Item #3a. (See Appendix (end of this form) for exemptions.)
M1g: Core Tests | Test core-drilled samples.	**2105A.4**. (See Appendix (end of this form) for exemptions.)
M1h: Prisms | Inspect preparation of prisms.	TMS 602 Articles 1.4.B.3 & 1.4.B.4 & Table 4 Item 4.
M1i: Dowels and Supports | Verify size, location and condition of all dowels, construction supporting masonry, etc.	
M1j: Reinforcement and Members | Verify size, grade and type of reinforcement, connectors, and anchor bolts. Verify size and location of structural members.	TMS 602 Table 4, Items 1c & 3c.
M1k: Reinforcement Placement | Inspect placement of reinforcement, anchor bolts, and connectors.	TMS 602 Table 4 Item 2c.
M1l: Grout Placement | Placement, consolidation, and reconsolidation of grout.	TMS 602 Table 4 Item 3h.
M1m: Unit Layup and Joints | Inspect placement of masonry units and construction of mortar joints.	TMS 602 Table 4 Item 3b.
M1n: Cold/Hot Weather Work | Verify preparation, construction and protection of masonry during cold weather (temperature below 40º F) or hot weather (temperature above 90º F).	TMS 602 Table 4 Item 3f. * May be performed by the project inspector when specifically approved by DSA.
M1o: Anchors and Embeds | Inspect type, size and location of anchors and all other items to be embedded in masonry including other details of anchorage of masonry	TMS 602 Table 4 Item 3d.

to structural members, frames and other construction.	
M1p: Grout Cavity | Inspect grout space, including mortar protrusions, prior to placement of grout.	TMS 602 Table 4 Item 2a.

M2. VENEER OR GLASS BLOCK PARTITIONS:	
Test or Special Inspection	**Code References and Notes**
M2a: Mortar and Grout | Verify proportions of site prepared mortar and grout and/or verify certification of premixed mortar.	TMS 602 Table 3 (row 5) and Table 4 Items 1a & 2d.
M2b: Unit Layup and Joints | Inspect placement of units and construction of mortar joints.	TMS 602 Table 4 Item 3b.
M2c: Wires and Connector | Inspect placement of wire, connectors and anchors	TMS 602 Table 4 Item 2c.
M2d: Anchors and Embeds | Inspect type, size and location of anchors and all other items to be embedded in masonry veneer including details of anchorage of masonry to veneer backing, frames and other construction.	TMS 602 Table 4 Item 3d.
M2e: Cold/Hot Weather Work | Verify preparation, construction and protection of masonry during cold weather (temperature below 40º F) or hot weather (above 90º F).	TMS 602 Table 4 Item 3f. * May be performed by the project inspector when specifically approved by DSA.
M2f: Adhered Veneer Bond | Test adhered veneer bond strength.	**1410.2.1 (Field-constructed mock-up using specified unit, mortar, and substrate, laboratory tested in accordance with ASTM C1823).**

M3. POST-INSTALLED ANCHORS IN MASONRY:	
Test or Special Inspection	**Code References and Notes**
M3a: Inspection | Inspect installation of post-installed anchors	**1617A.1.19, 1705A.4, Table 1705A.3 Item 4a (Continuous) & 4b (Periodic);** ACI 318 Section 26.13. * May be performed by the project inspector when specifically approved by DSA. (See Appendix (end of this form) for exemptions.)
M3b: Test | Test post-installed anchors.	**1705A.4, 1910A.5.** (See Appendix (end of this form) for exemptions.)

M4. OTHER MASONRY:	
Test or Special Inspection	**Code References and Notes**
M4a. | Not used.	N/A
M4b. | Not used.	N/A
M4c. | Not used.	N/A
M4d. | Not used.	N/A
M4e. | Not used.	N/A
M4f. | Not used.	N/A
M4g. | Not used.	N/A
M4h. | Not used.	N/A
M4i. | Not used.	N/A
M4j. | Not used.	N/A
M4k. | Not used.	Not used.
M4l. | Not used.	Not used.

Appendix: LIST OF STRUCTURAL TESTS AND SPECIAL INSPECTIONS

S/A1. STRUCTURAL STEEL, COLD-FORMED STEEL AND ALUMINUM USED FOR STRUCTURAL PURPOSES	
Test or Special Inspection	**Code References and Notes**
S/A1a: Material Identification | Verify identification of all materials and: • Mill certificates indicate material properties that comply with requirements. • Material sizes, types and grades comply with requirements.	**Table 1705A.2.1 Item 3a–3c.** 2202A.1**;** AISI S100 Section A3.1 & A3.2, AISI S240 Section A3 & A5, AISI S220 Sections A4 & A6. *By special inspector or qualified technician when performed off-site.
S/A1b: Unidentified Material | Test unidentified materials	**2202A.1.**
S/A1c: Steel Fabrication | Verify and document steel fabrication per DSA- approved construction documents.	Not applicable to cold-formed steel light-frame construction, except for trusses (**1705A.2.4**).
S/A1d: Buckling Restrained Brace | Verify and document steel fabrication per DSA-approved construction documents.	Testing and special inspections in accordance with IR 22-4. For DSA accepted fabrication shops, BRB manufacturer's Certificate of Compliance in lieu of testing and special inspections. See IR 22-4.

S/A2. HIGH-STRENGTH BOLTS:	
Test or Special Inspection	**Code References and Notes**
S/A2a: Product Verification | Verify identification markings and manufacturer's certificates of compliance conform to ASTM standards specified in the DSA-approved documents.	**Table 1705A.2.1 Items 1a & 1b, 2202A.1;** AISC 360 Section A3.3, J3.1, and N3.2; RCSC Section 1.5 & 2.1; DSA IR 17-8 & DSA IR 17-9.
S/A2b: Bolts, Nuts, and Washers | Test high-strength bolts, nuts and washers.	**Table 1705A.2.1 Item 1c, 2213A.1**; RCSC Section 7.2; DSA IR 17-8.
S/A2c: Snug Tight | Bearing-type ("snug tight") connections.	**Table 1705A.2.1 Item 2a, 1705A.2.6, 2204A.2**; AISC 360 J3.1, J3.2, M2.5 & N5.6; RCSC Section 9.1; DSA IR 17-9.
S/A2d: Pretensioned / Slip-Critical | Pretensioned and slip-critical connections.	**Table 1705A.2.1 Items 2b & 2c, 1705A.2.6, 2204A.2;** AISC 360 J3.1, J3.2, M2.5 & N5.6; RCSC Sections 9.2 & 9.3; DSA IR 17-9 *"Continuous" or "Periodic" depends on the tightening method used.

S/A3. WELDING:	
Test or Special Inspection	**Code References and Notes**
S/A3a: Weld Material | Verify weld filler material identification markings per AWS designation listed on the DSA-approved documents and the WPS.	**1705A.2.5, Table 1705A.2.1 Items 4 & 5**; AWS D1.1 and AWS D1.8 for structural steel; AWS D1.2 for Aluminum; AWS D1.3 for cold-formed steel; AWS D1.4 for reinforcing steel; DSA IR 17-3.
S/A3b: Certificate of Compliance | Verify weld filler material manufacturer's certificate of compliance.	DSA IR 17-3.
S/A3c: WPS and Qualifications | Verify WPS, welder qualifications and equipment.	DSA IR 17-3.

S/A4. SHOP WELDING (IN ADDITION TO SECTION S/A3):	
Test or Special Inspection	**Code References and Notes**
S/A4a: Weld Category A | Inspect groove welds, multi-pass fillet welds, single pass fillet welds > 5/16", plug and slot welds.	**Table 1705A.2.1 Items 5a.1–4;** AISC 360 (and AISC 341 as applicable); DSA IR 17-3.
S/A4b: Weld Category B | Inspect single-pass fillet welds ≤ 5/16", floor and roof deck welds.	**1705A.2.2, Table 1705A.2.1 Items 5a.5 & 5a.6;** AISC 360 (and AISC 341 as applicable); DSA IR 17-3.
S/A4c: Stairs and Railing | Inspect welding of stairs and railing systems.	**1705A.2.1**; AISC 360 (and AISC 341 as applicable); AWS D1.1 & D1.3; DSA IR 17-3.
S/A4d: Reinf. Steel Weldability | Verification of reinforcing steel weldability other than ASTM A706.	**1705A.3.1**; AWS D1.4; DSA IR 17-3. Verify carbon equivalent reported on mill certificates.
S/A4e: Reinforcing Steel | Inspect welding of reinforcing steel.	**Table 1705A.2.1 Item 5b, 1705A.3.1, Table 1705A.3 Item 2, 1903A.8;** AWS D1.4; DSA IR 17-3.

S/A5. FIELD WELDING (IN ADDITION TO SECTION S/A3):	
Test or Special Inspection	**Code References and Notes**
S/A5a: Weld Category A | Inspect groove welds, multi-pass fillet welds, single pass fillet welds > 5/16", plug and slot welds.	**Table 1705A.2.1 Items 5a.1–4;** AISC 360 (AISC 341 as applicable); DSA IR 17-3.
S/A5b: Weld Category B | Inspect single-pass fillet welds ≤ 5/16".	**Table 1705A.2.1 Item 5a.5;** AISC 360 (AISC 341 as applicable); DSA IR 17-3.
S/A5c: End Welded Studs | Inspect end-welded studs (ASTM A-108) installation (including bend test).	**2213A.2**; AISC 360 (AISC 341 as applicable); AWS D1.1; DSA IR 17-3.
S/A5d: Deck Welds | Inspect floor and roof deck welds.	**1705A.2.2, Table 1705A.2.1 Item 5a.6;** AISC 360 (AISC 341 as applicable); AWS D1.3; DSA IR 17-3.
S/A5e: Cold-Formed Steel | Inspect welding of structural cold-formed steel.	**1705A.2.5;** AWS D1.3; DSA IR 17-3. The quality control provisions of AISI S240 Chapter D shall also apply. * May be performed by the project inspector when specifically approved by DSA.
S/A5f: Stairs and Railing | Inspect welding of stairs and railing systems.	**1705A.2.1;** AISC 360 (AISC 341 as applicable); AWS D1.1 & D1.3; DSA IR 17-3. * May be performed by the project inspector when specifically approved by DSA.
S/A5g: Reinf. Steel Weldability | Verification of reinforcing steel weldability.	**1705A.3.1**; AWS D1.4; DSA IR 17-3. Verify carbon equivalent reported on mill certificates.
S/A5h: Reinforcing Steel | Inspect welding of reinforcing steel.	**Table 1705A.2.1 Item 5b, 1705A.3.1, Table 1705A.3 Item 2, 1903A.8;** AWS D1.4; DSA IR 17-3.

S/A6. NONDESTRUCTIVE TESTING:	
Test or Special Inspection	**Code References and Notes**
S/A6a: Ultrasonic | Ultrasonic	**1705A.2.1, Table 1705A.2.1 Item 4c, 1705A.2.5;** AISC 341 J6.2, AISC 360 N5.5; AWS D1.1, AWS D1.8; DSA IR 17-2.
S/A6b: Magnetic Particle | Magnetic Particle	**1705A.2.1, Table 1705A.2.1 Item 4c, 1705A.2.5;** AISC 341 J6.2, AISC 360 N5.5; AWS D1.1, AWS D1.8; DSA IR 17-2.
S/A6c: Not used.	N/A
S/A6d: Not used.	N/A
S/A6e: Not used.	N/A

S/A7. STEEL JOISTS AND TRUSSES:	
Test or Special Inspection	**Code References and Notes**
S/A7a: Fabrication | Verify size, type and grade for all chord and web members as well as connectors and weld filler material; verify joist profile, dimensions and camber (if applicable); verify all weld locations, lengths and profiles; mark or tag each joist.	**1705A.2.3, Table 1705A.2.3;** AWS D1.1; DSA IR 22-3 for steel joists only. **1705A.2.4;** AWS D1.3 for cold-formed steel trusses.

S/A8. SPRAYED FIRE-RESISTANT MATERIALS:	
Test or Special Inspection	**Code References and Notes**
S/A8a: Surface and Installation | Examine structural steel surface conditions, inspect application, take samples, measure thickness and verify compliance of all aspects of application with DSA-approved documents.	**1705A.15, 1705A.15.1, 1705A.15.2, 1705A.15.3, 1705A.15.4, 1705A.15.5, 1705A.15.6.**
S/A8b: Density | Test density.	**1705A.15.1, 1705A.15.5, ASTM E605**
S/A8c: Bond: Adhesion/Cohesion | Bond strength adhesion/cohesion.	**1705A.15.1, 1705A.15.6, ASTM E736**

S/A9. ANCHOR BOLTS AND ANCHOR RODS:	
Test or Special Inspection	**Code References and Notes**
S/A9a: Anchor Rods and Bolts | Anchor Bolts and Anchor Rods	Identify, sample and test anchor bolts and anchor rods **not** meeting exemptions identified in Section 1 of IR 17-11.
S/A9b: Other Threaded Rods | Threaded rod not used for foundation anchorage.	Identify, sample and test threaded rods **not** meeting exemptions identified in Section 1 of IR 17-11.

S/A10. STORAGE RACK SYSTEMS:	
Test or Special Inspection	**Code References and Notes**
S/A10a: Material Verification | Materials used, to verify compliance with one or more of the material test reports in accordance with the approved construction documents.	Table 1705A.13.7
S/A10b: Fabrication | Fabricated storage rack elements.	1704A.2.5; Table 1705A.13.7
S/A10c: Anchorage | Storage rack anchorage installation.	ANSI/MH16.1 Section 7.3.2; Table 1705A.13.7
S/A10d: Completed System | Completed storage rack system to indicate compliance with the approved construction documents.	Table 1705A.13.7; * May be preformed by the project inspector when specifically approved by DSA.

S/A11. Other Steel	
Test or Special Inspection	**Code References and Notes**
S/A11a. | Not used.	N/A
S/A11b. | Not used.	N/A
S/A11c. | Not used.	N/A
S/A11d. | Not used.	N/A
S/A11e. | Not used.	N/A
S/A11f. | Not used.	N/A
S/A11g. | Not used.	N/A
S/A11h. | Not used.	N/A
S/A11i. | Not used.	N/A
S/A11j. | Not used.	N/A
S/A11k. | Not used.	Not used.
S/A11l. | Not used.	Not used.

W1. PREFABRICATED WOOD TRUSSES:	
Test or Special Inspection	**Code References and Notes**
W1a: Open Web Truss Fabrication | Inspect fabrication of manufactured open-web trusses.	**1705A.5.6;** DSA IR 23-8.
W1b: Metal Plate Truss Fabrication | Inspect fabrication of manufactured metal-plate- connected trusses.	**1705A.5.6, 1705A.5.7;** DSA IR 23-4.

W2. MANUFACTURED WOOD STRUCTURAL ELEMENTS:	
Test or Special Inspection	**Code References and Notes**
W2a: GLS Timber Fabrication | Inspect fabrication of structural glued-laminated timber.*	* See **1705A.5.5** for exceptions
W2b: CLT Fabrication | Inspect fabrication of cross-laminated timber.	**1705A.5.5**
W2c: Mass Timber Erection | Inspect erection of mass timber.	**Table 1705A.5.3**, Item 2
W2d: Connections Type A | Inspect mass timber connections with threaded fasteners, bolts, and/or adhesive anchors other than described in item e below. Inspect concealed mass timber connections.	**Table 1705A.5.3**, Items 3.1, 3.3, 3.4, 3.5. For threaded fasteners: Verify use of proper installation equipment. Verify use of pre-drilled holes where required. Inspect screws, including diameter, length, head type, spacing, installation angle, and depth.
W2e: Connections Type B | Inspect mass timber connections with adhesive anchors installed in a horizontal or upward orientation.	**Table 1705A.5.3**, Item 3.2
W2f: Sealants | Inspect application of sealants or adhesives applied to mass timber elements.	**1705A.20**

W3. OTHER Wood:	
Test or Special Inspection	**Code References and Notes**
W3a. | Not used.	N/A
W3b. | Not used.	N/A
W3c. | Not used.	N/A
W3d. | Not used.	N/A
W3e. | Not used.	N/A
W3f. | Not used.	N/A
W3g. | Not used.	N/A
W3h. | Not used.	N/A
W3i. | Not used.	N/A
W3j. | Not used.	N/A
W3k. | Not used.	Not used.
W3l. | Not used.	Not used.

X1. OTHER:	
Test or Special Inspection	**Code References and Notes**
X01. | Load test for identified product(s):	1709A.2, 1709A.3. Testing is not required for: 1) a product with a valid evaluation service report per DSA IR A-5, or 2) a product that can be justified by structural calculation.
X02. | Installation torque for non-HS bolts on communication tower identified as essential service facility projects (ESFP).	Calibrated wrench use required, verified by SI during installation. DSA Policy PL 18-01: Communication Towers, Poles and Buildings Utilized by State Agencies for Essential Services Communications. *EXCEPTION: Non-ESFP may use PI without need for notification to DSA.
X03. | Not used.	N/A
X04. | Not used.	N/A
X05. | Not used.	N/A
X06. | Not used.	N/A
X07. | Not used.	N/A
X08. | Not used.	N/A
X09. | Not used.	N/A
X10. | Not used.	N/A

EXEMPTIONS

SOILS - EXEMPTIONS:
Soils: Eligible shallow foundation elements | Shallow foundations, are exempt from special inspections and testing by a Geotechnical Engineer for the following cases: A) buildings without a geotechnical report and meeting the exception Item #1 criteria in CBC Section 1803A.2 supported by native soil (any excavation depth) or fill soil (not exceeding 12" depth per CBC, Section 1804A.6), B) soil scarification/recompaction not exceeding 12" depth, C) native or fill soil supporting exterior non-structural flatwork (e.g., sidewalks, site concrete ramps, site stairs, parking lots, driveways, etc.), D) unpaved landscaping and playground areas, or E) utility trench backfill with depth not exceeding 12". These exempt structures shall be identified on the approved construction documents.
Soils: Eligible deep foundation elements, Type 1 | Deep foundation acting as cantilever footing with a design based on minimum allowable pressures per CBC Table 1806A.2 and without a geotechnical report are exempt from special inspection and testing by a Geotechnical Engineer for the following cases: A) free standing sign or scoreboard, B) cell or antenna towers and poles less than 35'-0" tall (e.g., lighting poles, flag poles, poles supporting open mesh fences, etc.). These exempt structures shall be identified on the approved construction documents.
Soils: Eligible deep foundation elements Type 2 | Deep foundation acting as cantilever footing with a design based on minimum allowable pressures per CBC Table 1806A.2 and without a geotechnical report are exempt from special inspection and testing by a Geotechnical Engineer for the following cases: A) single-story open fabric shade structure, or B) covered walkway structure with an apex height less than 10'-0" above adjacent grade. These exempt structures shall be identified on the approved construction documents.

CONCRETE/MASONRY - EXEMPTIONS:
Concrete/Masonry: Eligible post-installed anchors | Post-installed anchors for the following: A) exempt non-structural components (e.g., mechanical, electrical, plumbing equipment – see item 7 for "Welding" in the Appendix below) given in CBC Section 1617A.1.18 or B) interior nonstructural wall partitions meeting criteria listed in exempt item 3 for "Welding" in the Appendix below.
Concrete: Batch plant inspection for items listed in and complying with CBC Section 1705A.3.3.2. | Concrete batch plant inspection is not required for items given in CBC Section 1705A.3.3.2 subject to the requirements and limitations in that section.
Concrete: Epoxy shear dowels in nonstructural slab-on-grade per CBC Section 1910A.5.4, Exception #4. | Epoxy shear dowels in site flatwork and/or other nonstructural concrete.
Concrete/Masonry: Reinforcing bar testing for items listed in and complying with CBC Section 1910A.2. | Testing of reinforcing bars is not required for items given in CBC Section 1910A.2 subject to the requirements and limitations in that section. These exempt structures shall be identified on the approved construction documents.
Masonry: Freestanding site walls and retaining walls per DSA IR 21-1. | Freestanding and site retaining masonry walls may be exempt from certain DSA masonry testing and special inspection items as allowed per DSA IR 21-1.
Eligible precast elements | Structural tests and special inspections are not required for the following concrete precast elements. Provide a certificate of compliance at delivery. Exemptions shall be identified on the approved construction documents. 1. Underground vaults no greater than 5 feet x 5 feet x unlimited height and pipe manufactured to an ASTM standard, 5 foot or less in diameter. 2. Elements manufactured in a PCI or NPCA certified manufacturing plant:

A. Underground vaults no greater than 16 feet in both length and width, of unlimited height, not subject to loading greater than HS 20-44. B. Pipe. C. Stair treads, landing planks.

WELDING - EXEMPTIONS:
Welding: Eligible fences and gates | Fences, gates with maximum leaf span of 10', and gates with a maximum rolling section of 10' all having an apex height less than 8'-0" above lowest adjacent grade.
Welding: Eligible railing and ramps | Handrails, guardrails, and modular or relocatable ramps associated with walking surfaces less than 30" above adjacent grade; fillet welds shall not be ground flush.
Welding: Eligible interior cold-formed steel framing | Non-bearing non-shearwall interior cold-formed steel framing spanning less than 15'-0" in height and header less than 10'-0" in opening width, such as in interior partitions, interior soffits, etc.
Welding: Eligible equipment curbs | Manufactured support frames and curbs using hot rolled or cold-formed steel (i.e., light gauge) for mechanical, electrical, or plumbing equipment weighing less than 2000# (equipment only) (connections of such frames to superstructure elements using welding will require special inspection.)
Welding: Eligible components supporting MEP distribution systems | Manufactured components (e.g., Tolco, B-Line, Afcon, etc.) for mechanical, electrical, or plumbing hanger support and bracing (connections of such components to superstructure elements using welding will require special inspection.)
Welding: Eligible mounts and recreational equipment | TV Brackets, projector mounts with a valid listing (see DSA IR A-5) and recreational equipment (e.g., playground structures, basketball backstops, etc.) (connections of such elements to superstructure elements using welding will require special inspection.)
Welding: Eligible nonstructural components | Any support for exempt non-structural components given in CBC Section 1617A.1.18 meeting the following: A) when supported on a floor/roof, <400# or resulting composite center of mass (including component's center of mass) ≤4' above supporting floor/roof, B) when hung from a wall or roof/floor, and <20# for discrete units or <5 plf for distributed systems.

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 01-122444 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 02/11/2026

SPECIFICATIONS

FOR CONSTRUCTION

AT

CHUALAR SCHOOL

TRACK & FIELD REPLACEMENT
AND
NEW RESTROOM BUILDING

FOR

CHUALAR UNION SCHOOL DISTRICT
CHUALAR, CALIFORNIA

PROJECT NO. 24033
DSA App. No.: 01-122444

LICENSED ARCHITECT
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C-30852
Exp. 12/31/27
STATE OF CALIFORNIA

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6/19/25

LICENSED LANDSCAPE ARCHITECT
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Signature
5-31-2027
Renewal Date
6/18/2025
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EXP. JUNE 30, 2027
MECHANICAL
STATE OF CALIFORNIA

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Per C.A.C. Sec 4-317(c)), in a Summary of Work code section:
"Should any existing conditions such as deterioration or noncomplying construction be discovered that is not covered by the DSA approved documents wherein the finished work will not comply with Title 24, California Code of Regulations, a construction change document, or a separate set of plans and specifications, detailing and specifying the required repair work shall be submitted to and approved by the DSA before proceeding with the repair work."

SECTION 033000 – CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 SUMMARY:

A. Work Includes: Concrete construction, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes for the following concrete elements: foundations, pad footings, continuous footings, gradebeams, tie beams, and piers; retaining walls; structural slabs; building slabs-on-grade.

B. This Section does not include utility trench backfill, curb & gutters, sidewalks, walkways, driveways, roadways, parking lots, curbs & gutters, and other flatwork or pavement. See Divisions 31 and 32.

1.02 QUALITY ASSURANCE:

A. Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94 requirements for production facilities and equipment.

C. Special Inspection: Inspection and testing of the building subgrade and of the concrete construction shall be performed in accordance with CBC Chapter 17A and as delineated in the Statement of Special Inspections.

D. Comply with the references listed below; when an edition (year) is not listed, comply with the most current edition.

1.03 REFERENCES:

A. ACI 301: *Specification for Structural Concrete*

B. ACI 302.1R: *Guide for Concrete Floor and Slab Construction*

C. ACI 117: *Specifications for Tolerances for Concrete Construction and Materials*

D. ACI 318: *Building Code Requirements for Structural Concrete*, 2019 Edition.

E. ACI *Field Reference Manual*, Publication SP-15 (05).

F. Portland Cement Association (PCA): cement and concrete standards.

G. Concrete Reinforcing Steel Institute (CRSI): *Manual of Standard Practice*

H. 2022 *California Building Code* (CBC) Title 24, with amendments for DSA/SS.

I. Applicable or referenced materials and testing standards by the American Society of Testing Materials (ASTM).

J. *Supplemental Geotechnical Engineering Recommendations* for Chualar Elementary School Turf Replacement & Restroom Building Project for 24285 Lincoln Street, Chualar, California by Ajay Singh, G.E. of Earth Systems Pacific, dated April 1, 2025 Project File No. 306771-001. (This document may be referred to as the "Geotechnical Report" or "Soils Report" for the project.)

K. *Geotechnical Engineering Report Update and Soil Infiltration Rate Testing* for Chualar Elementary School Turf Replacement, 24285 Lincoln Street, Chualar, Monterey County, California, by Earth Systems Pacific, dated August 23, 2024.

L. *Geotechnical Engineering Report* for Chualar Elementary School Turf Replacement, 24285 Lincoln Street, Chualar, Monterey County, California, by Earth Systems Pacific, dated September 22, 2015.

1.04 SUBMITTALS:

A. Comply with the requirements of Division 1.

B. Product Data: For each type of product indicated.

C. Design Mixtures: For each concrete mixture.

D. Shop Drawings: For steel reinforcement. Material certificates.

E. Proposed Finishes: Submit to Architect and Owner for approval.

PART 2 - PRODUCTS

2.01 FORM-FACING MATERIALS:

A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.

B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

2.02 STEEL REINFORCEMENT:

A. Reinforcing Bars that will not be welded: ASTM A615, deformed, clean, free of rust, and as follows:

1. #3 bars and smaller: Grade 40 or 60
2. #4 bars and larger: Grade 60

B. Reinforcing Bars that are to be welded: ASTM A706, deformed, clean, free of rust, and as follows:

1. #3 bars and smaller: Grade 40 or 60

2. #4 bars and larger: Grade 60

C. Epoxy-Coated Reinforcing Bars: Shall also conform to ASTM A775.

D. Plain-Steel Welded Wire Reinforcement: ASTM A185, plain, fabricated from as-drawn steel wire into flat sheets.

E. Deformed-Steel Welded Wire Reinforcement: ASTM A497, flat sheet.

F. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice."

G. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice.

2.03 CONCRETE MATERIALS:

A. Cementitious Material:

1. Portland Cement, ASTM C 150, Type II, low-alkali
2. Fly Ash: ASTM C618, Class F: 15% max. by weight may be substituted for Portland cement, if mix design is proportioned per ACI 318 Section 5.3.
3. ASTM C595 Type IL (MS) cement with pre-approval.

B. Aggregates:

1. ASTM C33, graded, normal weight. Course aggregate shall be crushed rock.
2. Normal-weight, except where lightweight concrete is specified.
3. 1 inch max. nominal size
4. Largest aggregate size shall be reduced depending upon location and use of the concrete, so that aggregate does not exceed any of the following:
   a. 1/5 the narrowest dimension between sides of forms
   b. 1/3 the least depth (thickness) of slab
   c. 3/4 the minimum clear spacing between individual reinforcing steel, ducts and/or conduits.
   d. 3/4 the clear space between reinforcement and forms
5. Conform to CBC Chapter 19A.

C. Water: ASTM C94, and clean and free from deleterious amounts of acids, salts, alkali, and organic materials.

D. Air-Entraining Admixture: ASTM C260

Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride. Admixtures, when used, shall conform to:

1. Water-Reducing Admixture: ASTM C494, Type A.
2. Retarding Admixture: ASTM C494, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C494/, Type D.

4. Plasticizing and Retarding Admixture: ASTM C1017/, Type II
5. Air-Entraining Admixture: ASTM C260.

E. Shrinkage-Reducing Admixture: Shall be used for Slabs.

1. "Eclipse Floor" by Grace Construction Products,
2. “Tetraguard AS20" by BASF Admixtures,
3. or Approved Equal.

2.04 VAPOR RETARDERS:

A. Plastic Vapor Retarder: ASTM E1745, Class A, “VaporBlock VB 15” by Raven Industries, “Moistop Ultra 15”, by Fortifiber Corporation, or approved equal. Provide all necessary accessories including adhesive, seam tape, and pipe boots, as approved by plastic vapor retarder manufacturer for the conditions of use.

2.05 CURING MATERIALS:

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

B. Absorptive Cover: AASHTO M182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz/sq.yd. when dry.

C. Moisture-Retaining Cover: ASTM C171, polyethylene film or white burlap-polyethylene sheet.

D. Water: Potable.

2.06 RELATED MATERIALS:

A. Anchor Bolts and Anchor Rods: Heavy Hex-Headed ASTM A36, A307, or F1554 Grade 36, unless noted otherwise.

B. Threaded Rods: Carbon steel conforming to ASTM A307 Grade C or ASTM A193 Grade B7; or stainless steel conforming to ASTM F593 Alloy Group 1 Type 304 Condition CW.

C. Bolts or rods exposed to weather, soil, or moisture shall be hot dip galvanized per ASTM A153 or shall be stainless steel.

D. Mechanical Bar Splice Couplers:

1. Bar-Lock L-series couplers, or approved equal.
2. With lockshear bolts and internal serrated grip rails within the coupling sleeve.
3. Couplers shall exceed the specification requirements for both tension and compression specified by ACI 318 and CBC Title 24 and shall be recognized and approved by ICC.

E. Expansion- and Isolation-Joint-Filler Strips: ASTM D1751, asphalt-saturated cellulosic fiber or ASTM D1752, cork or self-expanding cork.

F. Contraction Joint Filler: Two-component semi-rigid epoxy resin / polymer, 100% solids,

minimum “Shore A” hardness of 80 when measured in accordance with ASTM D2240.

G. Epoxy/Adhesive Anchors: Install only where specifically detailed. Type shall be approved for cracked concrete per 2022 CBC and DSA.

H. Expansion Anchors: Install only where specifically detailed. Type shall be approved for cracked concrete per 2022 CBC and DSA.

2.07 CONCRETE MIXTURES:

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301 and 318, and normal weight.

B. Proportion normal-weight concrete mixture as follows:

1.	Compressive Strength, Minimum:	4000 psi at 28 days
2.	Water-Cementitious (W/C) Materials Ratio, Max.:	0.45
3.	Slump:	4 inches +/- 1 inch
4.	Air Content, Max.:	3 percent

C. Shrinkage-Reducing Admixture (SRA): Include in Slab Mixtures so as to limit total concrete shrinkage to a maximum of 0.040% at 28 days. (In order to assist in drying shrinkage reduction, the W/C ratio may be lowered and a water-reducer added.) The addition rate shall be within the manufacturer’s “typical” or “recommended” range at a minimum, regardless of the design shrinkage percentage. Note that if separate footing and slab concrete mixes are supplied, the footing mix need not contain SRA.

D. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C94, and furnish batch ticket information. When air temperature is between 85° and 90°F, reduce mixing and delivery time from 90 minutes to 75 minutes; when air temperature is above 90°F, reduce mixing and delivery time to 60 minutes.

E. Drypack/Grout: Non-shrink grout by Five Star Products Inc., Quikrete, or approved equal, for the intended use, installed at a “plastic” consistency, in accordance with approved methods and techniques and per the manufacturer’s requirements.

2.08 MISCELLANEOUS STEEL

A. Where steel plates, sections, fabricated connectors or other miscellaneous steel elements are shown in the drawings or otherwise required in the project (but a separate Section 051200 is not included), then provide as follows:

1. Conform to requirements of ASTM and fabricate according to AISC and AWS standards.
2. Special inspection of welding is required.
3. ASTM A36 minimum grade or Type 304 Stainless Steel, unless noted otherwise per plan.
4. Steel that is exposed to weather, moisture, or soil must be hot dip galvanized, stainless steel, or protected from corrosion per the Architect.
5. Provide vent holes in end plates of hollow sections of fabrications that are to be hot dip galvanized.

6. Bolt holes shall be AISC “standard holes.” Do not oversize or slot.
7. Finishes are per the Owner and Architect.

PART 3 - EXECUTION

3.01 SUBGRADE PREPARATION:

A. Grading, excavations, compaction and other subgrade preparation shall be under the supervision of a Geotechnical Engineer and in accordance with the referenced soils reports.

3.02 FORMWORK:

A. Design, erect, shore, brace, and maintain formwork according to ACI 301 to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

C. Chamfer exterior corners and edges of permanently exposed concrete when required by the Owner or Architect.

D. Provide air relief holes as necessary.

E. Removal of Formwork: Comply with ACI 301 and ACI 318.

3.03 EMBEDDED ITEMS:

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

B. Embedded items shall be secured in place prior to foundation inspection and prior to pouring concrete.

C. Epoxy/Adhesive: Use only where specifically detailed by the Engineer or Architect. Install per the manufacturer’s ICC Evaluation Report. Special Inspection is required.

D. Expansion Anchors: Use only where specifically detailed by the Engineer or Architect. Install per the manufacturer’s ICC Evaluation Report. Special Inspection is required.

E. Sill Plate Anchorage:

1. Refer to the construction documents for detailed requirements. Conform with this Section at a minimum.
2. Lumber bearing on concrete or masonry shall be pressure preservative treated wood.
3. Shearwalls:
   a. Sill plates shall be 3x thickness, except where 2x thickness is explicitly allowed.
   b. Secure sill plates with ⅝" dia. headed anchor bolts (AB) with 7" minimum embedment into concrete. Bolts shall not be less than 12" long, however increase

length as required for specified embedment, extension through curb and leveling grout (where occurs), and for extension above sill plate for fully securing with washer(s) and nut. Do not use bent-bar (“J” or “L”) anchor bolts.

c. 3”x3”x0.229” plate washers (e.g. Simpson BP5/8-3 or BPS5/8-3). The hole in the plate washer may be diagonally slotted, provided that a standard cut washer is placed between the plate washer and nut. The plate washer shall extend to within ½” of edge of the sill plate on the sheathed side.

d. Refer to the foundation plan for minimum quantity of AB per shearwall. Refer to the Shearwall Schedule for maximum anchor bolt spacing. Spacing shall not exceed 4 ft. on-center. Bolts shall be placed a maximum of 9" from wall corners, wall ends, and sill plate splices, but not less than 4½”, and a minimum of two bolts per piece of sill plate are required. Holdown anchors shall not be counted as any of the required sill plate AB.

e. Use AB holders and stabilizers per the manufacturer’s recommendations, or approved equivalent.

f. AB’s into Existing Concrete: Refer to the structural plans and details.

4. Non-Shearwalls:

a. Secure sill plates with ⅝" dia. headed anchor bolts (AB) with 7" minimum embedment into concrete. Bolts shall not be less than 12" long, however increase length as required for specified embedment, extension through curb and leveling grout (where occurs), and for extension above sill plate for fully securing with washer and nut. Do not use bent-bar (“J” or “L”) anchor bolts.

b. 3”x3”x0.229” plate washers (e.g. Simpson BP5/8-3) at all AB.

c. Bolts shall be placed a maximum of 12" from wall corners, wall ends, and sill plate splices, but not less than 4½”, and a minimum of two bolts per piece of sill plate are required. Spacing of AB shall not exceed 4 ft. on-center for exterior walls and 6 ft. on-center for interior walls.

d. Use AB holders and stabilizers per the manufacturer’s recommendations, or approved equivalent.

e. AB’s into Existing Concrete: Refer to the structural plans and details.

F. Holdowns: See the drawings for holdown locations and additional notes.

3.04 VAPOR RETARDERS:

A. Plastic Vapor Retarders: Place, protect, and repair vapor retarders according to ASTM E1643, the referenced Geotechnical Report, and manufacturer's written instructions. Lap joints 6 inches and seal with manufacturer's recommended tape, provide pipe boots at all required locations. Refer to the referenced Soils Report and the drawings for additional requirements.

3.05 STEEL REINFORCEMENT:

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

B. Mechanical Bar Splice Couplers:

1. May be used in lieu of lap splices.
2. Use where indicated on the drawings.

3. Stagger adjacent splices 2 feet minimum.
4. Install per the ICC evaluation report.

C. Lap splices: Stagger 2 feet and with minimum bar lap lengths per the Structural Drawings.

D. Hooks: Refer to Structural Drawings.

E. Dowels: Shall be provided for vertical and horizontal reinforcing bars in walls, columns, curbs, slabs etc., and shall be of the same size and spacing as the supporting or adjacent footing, slab, wall, column, etc. unless noted otherwise on the drawings.

F. Reinforcing Clearances (Cover) for Footings:

1. 3 inches when poured against earth
2. 2 inches when poured against formed surfaces, existing concrete, or top of concrete, except where dimensioned otherwise in the drawings.
3. Where required clearance cannot be achieved, reinforcing shall be epoxy or zinc painted or sprayed. Clearance reduction requires specific approval from the Structural Engineer.

3.06 JOINTS:

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints:

1. Install so strength and appearance of concrete are not impaired, at locations indicated and as approved by Architect.
2. Construction joints shall be roughened to an amplitude of approximately ¼" per ACI 318 section 11.7.9.
3. Wire brush, clean and dampen immediately prior to pouring.
4. Location of foundation construction joints shall be approved by the Engineer.

C. Contraction Joints (or "control joints") in Slabs: Form weakened-plane contraction joints, sectioning concrete into approximately square areas, not to exceed a 1.5:1 length to width ratio. Conform to ACI and PCA recommendations. Construct contraction joints as follows:

1. Grooved (Tooled) Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
3. Owner or Architect's specifications or requirements for contraction joints shall take precedence over these specifications.

D. Isolation Joints in Slabs: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, as indicated.

3.07 CONCRETE PLACEMENT:

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

B. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.

C. Floor Slabs: Comply with ACI 302.1R. When concrete is placed directly on top of the vapor retarder, the concrete contractor shall make the necessary changes in the concrete placement.

D. Cold-Weather Placement: Comply with ACI 306.1.

E. Hot-Weather Placement: Comply with ACI 301.

3.08 FINISHING FORMED SURFACES:

A. Concrete that may remain exposed to public view shall be “Smooth-Formed Finished Concrete.” Concrete that will not be exposed to public view shall be “Rough-Formed Finished Concrete” or “Smooth-Formed Finished Concrete.”

B. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

C. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes, voids, and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

E. Owner or Architect’s specifications or requirements for finishing formed surfaces shall take precedence over these specifications.

3.09 FINISHING FLOORS AND SLABS:

A. Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces.

B. Per the Owner or Architect’s specifications or requirements.

3.10 CONCRETE PROTECTING AND CURING:

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing. Concrete shall be maintained above 50°F and in a moist

condition for at least the first seven days after placement. When concrete is placed directly on top of the vapor retarder, the concrete contractor shall make the necessary changes in the concrete curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Cure concrete according to ACI 308.1, by one or a combination of the following methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days.
2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period. After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound will not interfere with bonding of floor covering used on Project.
4. Curing and Sealing Compound: For interior concrete slabs that may be permanently exposed to public view or where required by the Owner or Architect, apply uniformly to floors and slabs in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.11 FIELD QUALITY CONTROL:

A. The Contractor shall suitably protect the work in order to maintain finishes in perfect condition until final completion and acceptance.

B. Repair and patch defective areas where required by the Owner, Architect, Engineer, or DSA. Remove and replace concrete that cannot be repaired and patched to Owner, Architect, Engineer, or DSA's approval. Any repair or replacement shall be at no additional cost to the Owner.

C. Testing and Inspecting: Contractor shall engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

D. Testing Services:

1. Tests shall be performed according to ACI 301 and CBC Chapter 17A for concrete construction, except where specifically excluded.
2. Batch plant continuous inspection is required per CBC Chapter 17A, except when waived.

E. Special Inspections: Refer to the Statement of Special Inspections for special inspections of work specified in the structural drawings.

F. The Geotechnical Engineer shall provide the Owner and DSA with a report that the building pad was prepared in accordance with the soils report and that the foundation excavations, the soil properties and bearing capacity conform to the Geotechnical Report and the design parameters indicated on the structural drawings.

G. The Geotechnical Engineer shall inspect, test, and sign-off all grading and excavations prior to placement of forms, reinforcing steel or concrete.

END OF SECTION 033000

SECTION 051200 – STRUCTURAL STEEL

PART 1 - GENERAL

1.01 SUMMARY

A. Work Includes: structural steel, including steel framing, metal (steel) deck, braces, welding, bolting, and miscellaneous connections and fabrications.

1.02 SUBMITTALS

A. Comply with Division 1 specifications and the Architect's additional instructions.

B. Product Data: For each type of product indicated.

C. Shop Drawings: Show fabrication of structural-steel components.

D. Welding certificates.

E. Mill test reports.

F. Source quality-control test reports.

1.03 QUALITY ASSURANCE

A. Fabricator Qualifications: A qualified fabricator, approved by the building department and the Owner, who has had review and approval by a certified special inspector. Approval shall be based upon review of the fabricator's written procedural and quality control manuals and periodic auditing of fabrication practices by an approved special inspection agency.

B. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code - Steel," supplemented with AWS D1.8, "Structural Welding Code – Seismic Supplement." Welding shall be performed by approved certified welders.

C. Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

D. Special Inspection: Inspection and testing shall be performed in accordance with CBC Chapter 17 and as delineated in the Statement of Special Inspections.

E. Comply with the references listed below; when an edition (year) is not listed, comply with the most current edition.

1.04 REFERENCES

A. AISC 360 – *Specification for Structural Steel Buildings*

B. AWS D1.1 – *Structural Welding Code – Steel*

C. AWS D1.3 – *Structural Welding Code – Sheet Steel*

D. AWS D1.4 – *Structural Welding Code – Reinforcing Steel*

E. AWS QC1 – *Standard for AWS Certification of Welding Inspectors*

F. 2022 *California Building Code* (CBC) Title 24, with amendments for DSA/SS.

G. Applicable or referenced materials and testing standards by the American Society of Testing Materials (ASTM).

PART 2 - PRODUCTS

2.01 STRUCTURAL-STEEL MATERIALS

A. W-Shapes: ASTM A992 or ASTM A572 Grade 50

B. HSS (Hollow Structural Sections) – including Rectangular, Square, and Round – shall conform to ASTM A500, Grade C.

C. Steel Pipe: ASTM A53 Grade B or ASTM A501.

D. Other Shapes (e.g. Angles, Channels): ASTM A36 or ASTM A572 Grade 50.

E. Plates: ASTM A572 Grade 50

F. Stainless Steel:

1. Plates, sheets, and strips: ASTM A240 and Grade Type 304 (or 316 if welded).
2. Bars and shapes: ASTM A276 and Type 304 (or 316 if welded).

G. Welding Electrodes: Comply with AWS requirements. See “Seismic Welds” below for welds in the SFRS.

H. Steel Reinforcing Bars (rebar): See Section 033000 – Cast-In-Place Concrete.

I. Drypack/Grout: See Section 033000 - Cast-In-Place Concrete.

2.02 BOLTS, CONNECTORS, AND ANCHORS

A. Bolts, Nuts, and Washers:

1. ASTM A325, Type 1, heavy hex steel structural bolts; ASTM A563 heavy hex carbon-steel nuts; and ASTM F436 hardened carbon-steel washers.

B. Anchor Rods (or Anchor Bolts): ASTM F1554 Grade 36, unless noted otherwise.

C. Threaded Rods: Carbon steel conforming to ASTM A307 Grade C or ASTM A193 Grade B7; or stainless steel conforming to ASTM F593 Alloy Group 1 Type 304 Condition CW.

D. Bolts or rods exposed to weather, soil, or moisture shall be hot dip galvanized per ASTM A153 or shall be stainless steel.

2.03 PRIMER

A. Primer: SSPC-Paint 25, Type II, iron oxide, zinc oxide, raw linseed oil, and alkyd.

B. Primer: Fabricator's standard lead- and chromate-free, non-asphaltic, rust-inhibiting primer.

2.04 FABRICATION

A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to referenced standards and specifications.

B. Weld Connections: Comply with AWS D1.1 for welding procedure specifications, tolerances, appearance, and quality of welds and for methods used in correcting welding work, supplemented with AWS D1.8 as required.

C. Exposed structural steel shall conform to AISC 303 Section 10 for architecturally exposed structural steel (AESS).

D. General:

1. Use materials of size and thickness shown. If not shown, use required size and thickness to produce strength and durability in the finished product.
2. Work to dimensions shown on the architectural drawings. Plan and elevation dimensions shown on structural drawings are shown for clarification.
3. Form exposed work true to line and level, with accurate angles and surfaces and with straight shape edges. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
4. Ease exposed edges to a radius of approximately 1/32" unless otherwise shown. Weld corners and seams continuously, complying with AWS recommendations.
5. At exposed connections, grind exposed welds smooth, unless reasonably smooth and uniform welds have been provided. Additional finish requirements are per the Architect.
6. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of type shown or, if not shown, use Phillips flathead (countersunk) screws or bolts.
7. Provide for anchorage of the type shown or required. Coordinate with supporting structure. Fabricate and space the anchoring devices to provide adequate support for intended use.
8. Cut, reinforce, drill, and tap miscellaneous metal work as indicated to receive finish hardware and similar items.
9. Install drain holes in hollow assemblies to be hot dip galvanized, without compromising the required strength of the assembly.
10. Sections, plates and bars shall not be sheared gas-cut or saw-cut.
11. Bolt holes:
    a. Holes in Baseplates: AISC “Standard” or “Oversize” holes.
    b. All Other Holes: AISC “Standard” holes, drilled a maximum of 1/16” larger than the bolt diameter.

12. Welding shall be performed using SMAW, SAW, GMAW, or FCAW processes with approved electrodes conforming to ASTM A-233 and applicable AWS specifications. Welds shall use E70XX electrodes, unless noted otherwise, with a minimum CVN toughness of 20 ft-lb at -20°F, using AWS A5 classification test methods.
13. Minimum preheat and interpass temperatures shall be provided for all welds, including tack welds, in accordance with AWS D1.1, Table 3.2. The maximum preheat and maximum interpass temperature permitted is 550°F, measured at a distance of 1 in. from the point of arc initiation.
14. Welding shall be performed by welders certified in accordance with AWS D1.1.
15. Use weld tabs (backing bars) as required. After welding, remove weld tabs and finish to a smooth contour. Backgouge the weld root to sound metal and weld backgouged region.

2.05 SHOP PRIMING

A. Shop prime steel surfaces except the following:

1. Surfaces embedded in concrete or mortar in an interior protected environment. Extend priming of partially embedded members to a depth of 2 inches.
2. Surfaces to be field welded.
3. Surfaces to receive sprayed fire-resistive materials.
4. Galvanized surfaces.

B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to SSPC-SP2, "Hand Tool Cleaning."

C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a dry film thickness of not less than 1.5 mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

D. Materials exposed to weather, soil, or moisture shall be hot dip galvanized (G90 min. coating), shall be stainless steel, or protected per the Owner or Architect’s requirements when specified.

PART 3 - EXECUTION

3.01 ERECTION

A. Examination: Verify elevations of bearing surfaces and locations of anchor rods, bearing plates, and other embedments, with steel erector present, for compliance with requirements. Proceed with installation only after unsatisfactory conditions have been corrected.

B. Set structural steel accurately in locations and to elevations indicated.

C. Maintain erection tolerances of structural steel within AISC's *Code of Standard Practice for Steel Buildings and Bridges*.

D. No holes other than those specifically detailed shall be allowed through structural steel members. No cutting or burning of structural steel will be permitted without prior consent of the engineer and special inspector.

3.02 FIELD CONNECTIONS

A. Standard Bolts: Install ASTM A307 bolts, unless noted otherwise, per AISC specifications in snug-tight condition.

B. Weld Connections: Comply with AWS standards for welding procedure specifications, tolerances, appearance, and quality of welds and for methods used in correcting welding work. Comply with AISC and AWS standards for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.

3.03 FIELD QUALITY CONTROL

A. The Contractor shall suitably protect the work in order to maintain finishes in perfect condition until final completion and acceptance.

B. Finishes of exposed materials are per the Owner or Architect.

C. Welded Connections: Field welds shall be inspected according to AWS D1.1 and the construction documents.

D. Testing and Inspecting: Contractor shall engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

E. Special Inspections: Refer to the Structural Title Sheet, *Statement of Special Inspections*.

F. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

G. Repair defective elements where required by the Owner, Architect, or Engineer. Remove and replace elements that cannot be repaired to Owner, Architect, or Engineer’s approval. Any repair or replacement shall be at no additional cost to the Owner.

END OF SECTION 051200

SECTION 055213 - PIPE AND TUBE RAILINGS

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 pipe and tube railings.

1.3 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

C. Schedule installation so wall attachments are made only to completed walls. Do not support railings temporarily by any means that do not satisfy structural performance requirements.

1.4 ACTION SUBMITTALS

A. Product Data: For the following:

1. Manufacturer's product lines of mechanically connected railings.
2. Railing brackets.
3. Grout, anchoring cement, and paint products.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

C. Delegated-Design Submittal: For railings, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For testing agency.

B. Welding certificates.

C. Mill Certificates: Signed by manufacturers of stainless-steel products certifying that products furnished comply with requirements.

D. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers certifying that shop primers are compatible with topcoats.

E. Product Test Reports: For pipe and tube railings, for tests performed by a qualified testing agency, according to ASTM E 894 and ASTM E 935.

F. Evaluation Reports: For post-installed anchors, from ICC-ES.

1.6 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.7 DELIVERY, STORAGE, AND HANDLING

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

1.8 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Steel Pipe and Tube Railings:

1. Manufacturers: Subject to compliance with requirements.

2.2 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design railings, including attachment to building construction.

B. Structural Performance: Railings, including attachment to building construction, shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Handrails and Top Rails of Guards:

    a. Uniform load of 50 lbf/ ft. (0.73 kN/m) applied in any direction.
    b. Concentrated load of 200 lbf (0.89 kN) applied in any direction.
    c. Uniform and concentrated loads need not be assumed to act concurrently.

C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C, material surfaces).

2.3 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

B. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails unless otherwise indicated.

1. Provide type of bracket with flange tapped for concealed anchorage to threaded hanger bolt and that provides 1-1/2-inch (38-mm) clearance from inside face of handrail to finished wall surface.

2.4 STEEL AND IRON

A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

B. Tubing: ASTM A 500 (cold formed) or ASTM A 513.

C. 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.

1. Provide galvanized finish for exterior installations and where indicated.

D. Plates, Shapes, and Bars: ASTM A 36/A 36M.

E. Cast Iron: Either gray iron, ASTM A 48/A 48M, or malleable iron, ASTM A 47/A 47M, unless otherwise indicated.

F. Expanded Metal: ASTM F 1267, Type I (expanded) Type II (expanded and flattened), Class 1 (uncoated).

G. Perforated Metal: Galvanized-steel sheet, ASTM A 653/A 653M, G90 (Z275) coating, commercial steel Type B.

2.5 FASTENERS

A. General: Provide the following:
1. Hot-Dip Galvanized Railings: Type 304 stainless-steel or hot-dip zinc-coated steel fasteners complying with ASTM A 153/A 153M or ASTM F 2329 for zinc coating.
2. Provide exposed fasteners with finish matching appearance, including color and texture, of railings.

B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and capable of withstanding design loads.

C. Fasteners for Interconnecting Railing Components:

1. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless otherwise indicated.
2. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless exposed fasteners are unavoidable or are the standard fastening method for railings indicated.
3. Provide tamper-resistant flat-head machine screws for exposed fasteners unless otherwise indicated.

D. Post-Installed Anchors: Torque-controlled expansion anchor or chemical anchors capable of sustaining, without failure, a load equal to 6 times the load imposed when installed in unit masonry and 4 times the load imposed when installed in concrete, as determined by testing according to ASTM E 488/E 488M, conducted by a qualified independent testing agency.

1. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 (A1) or Group 2 (A4) stainless-steel bolts, ASTM F 593 (ASTM F 738M), and nuts, ASTM F 594 (ASTM F 836M).

2.6 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

B. Low-Emitting Materials: Paints and coatings shall comply with the testing and product requirements of the California Department of Public Health's (formerly, the California Department of Health Services') "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

C. Etching Cleaner for Galvanized Metal: Complying with MPI#25.

D. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

E. Shop Primers: Provide primers that comply with Section 099113 "Exterior Painting."

F. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.

1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.

G. Epoxy Zinc-Rich Primer: Complying with MPI#20 and compatible with topcoat.

H. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.

I. Intermediate Coats and Topcoats: Provide products that comply with Section 099113 "Exterior Painting."

J. Epoxy Intermediate Coat: Complying with MPI #77 and compatible with primer and topcoat.

K. Polyurethane Topcoat: Complying with MPI #72 and compatible with undercoat.

L. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.

M. Non-shrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

N. Anchoring Cement: Factory-packaged, non-shrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound.

1. Water-Resistant Product: At exterior locations and where indicated provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended by manufacturer for exterior use.

2.7 FABRICATION

A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.

B. Shop assemble railings to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.

C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm) unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

D. Form work true to line and level with accurate angles and surfaces.

E. Fabricate connections that are exposed to weather in a manner that excludes water. Provide weep holes where water may accumulate.

F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.

G. Connections: Fabricate railings with either welded or nonwelded connections unless otherwise indicated.

H. 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.

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove flux immediately.
4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.

I. Nonwelded Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.

1. Fabricate splice joints for field connection using an epoxy structural adhesive if this is manufacturer's standard splicing method.

J. For changes in direction made by bending, use jigs to produce uniform curvature for each repetitive configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

K. Close exposed ends of railing members with prefabricated end fittings.

L. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is 1/4 inch (6 mm) or less.

M. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.

1. At brackets and fittings fastened to plaster or gypsum board partitions, provide crush-resistant fillers or other means to transfer loads through wall finishes to structural supports and prevent bracket or fitting rotation and crushing of substrate.

N. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by railings. Coordinate anchorage devices with supporting structure.

O. For railing posts set in concrete, provide steel sleeves not less than 6 inches (150 mm) long with inside dimensions not less than 1/2 inch (13 mm) greater than outside dimensions of post, with metal plate forming bottom closure.

P. For removable railing posts, fabricate slip-fit sockets from steel tube or pipe whose ID is sized for a close fit with posts; limit movement of post without lateral load, measured at top, to not more than one-fortieth of post height. Provide socket covers designed and fabricated to resist being dislodged.

1. Provide chain with eye, snap hook, and staple across gaps formed by removable railing sections at locations indicated. Fabricate from same metal as railings.

2.8 STEEL AND IRON FINISHES

A. Galvanized Railings:

1. Hot-dip galvanize exterior steel railings, including hardware, after fabrication.
2. Comply with ASTM A 123/A 123M for hot-dip galvanized railings.
3. Comply with ASTM A 153/A 153M for hot-dip galvanized hardware.
4. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.
5. Fill vent and drain holes that are exposed in the finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.

B. For galvanized railings, provide hot-dip galvanized fittings, brackets, fasteners, sleeves, and other ferrous components.

C. Preparing Galvanized Railings for Shop Priming: After galvanizing, thoroughly clean railings of grease, dirt, oil, flux, and other foreign matter, and treat with etching cleaner.

D. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with requirements indicated below:

1. Exterior Railings: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
2. Railings Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
3. Railings Indicated to Receive Primers Specified in Section 099600 "High-Performance Coatings": SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
4. Other Railings: SSPC-SP 3, "Power Tool Cleaning."

E. Primer Application: Apply shop primer to prepared surfaces of railings unless otherwise indicated. Comply with requirements in SSPC-PA 1, "Shop, Field, and Maintenance Painting of Steel," for shop painting. Primer need not be applied to surfaces to be embedded in concrete or masonry.

1. Shop prime uncoated railings with universal shop primer unless zinc-rich primer is indicated.
2. Do not apply primer to galvanized surfaces.

F. Shop-Painted Finish: Comply with Section 099113 "Exterior Painting."

1. Color: As selected by Architect from manufacturer's full range.

G. High-Performance Coating: Apply epoxy intermediate and polyurethane topcoats to prime-coated surfaces. Comply with coating manufacturer's written instructions and with requirements in SSPC-PA 1, "Shop, Field, and Maintenance Painting of Steel," for shop painting. Apply at spreading rates recommended by coating manufacturer.

1. Color: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine plaster and gypsum board assemblies, where reinforced to receive anchors, to verify that locations of concealed reinforcements are clearly marked for Installer. Locate reinforcements and mark locations if not already done.

3.2 INSTALLATION, GENERAL

A. Fit exposed connections together to form tight, hairline joints.

B. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.

1. Do not weld, cut, or abrade surfaces of railing components that are coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
2. Set posts plumb within a tolerance of 1/16 inch in 3 feet (2 mm in 1 m).
3. 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 (6 mm in 3.5 m).

C. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1. Coat, with a heavy coat of bituminous paint, concealed surfaces of aluminum that are in contact with grout, concrete, masonry, wood, or dissimilar metals.

D. Adjust railings before anchoring to ensure matching alignment at abutting joints.

E. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.3 RAILING CONNECTIONS

A. Nonwelded Connections: Use mechanical or adhesive joints for permanently connecting railing components. Seal recessed holes of exposed locking screws using plastic cement filler colored to match finish of railings.

B. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in "Fabrication" Article whether welding is performed in the shop or in the field.

C. Expansion Joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve extending 2 inches (50 mm) beyond joint on either side, fasten internal sleeve securely to one side, and locate joint within 6 inches (150 mm) of post.

3.4 ANCHORING POSTS

A. Use metal sleeves preset and anchored into concrete for installing posts. After posts are inserted into sleeves, fill annular space between post and sleeve with nonshrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions.

B. Form or core-drill holes not less than 5 inches (125 mm) deep and 3/4 inch (20 mm) larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions.

C. Cover anchorage joint with flange of same metal as post, welded to post after placing anchoring material.

D. Leave anchorage joint exposed with 1/8-inch (3-mm) buildup, sloped away from post.

E. Anchor posts to metal surfaces with oval flanges, angle type, or floor type as required by conditions, connected to posts and to metal supporting members as follows:

1. For aluminum pipe railings, attach posts using fittings designed and engineered for this purpose.
2. For stainless-steel pipe railings, weld flanges to post and bolt to supporting surfaces.
3. For steel pipe railings, weld flanges to post and bolt to metal supporting surfaces.

F. Install removable railing sections, where indicated, in slip-fit metal sockets cast in concrete.

3.5 ATTACHING RAILINGS

A. Anchor railing ends at walls with round flanges anchored to wall construction and welded to railing ends or connected to railing ends using nonwelded connections.

B. Anchor railing ends to metal surfaces with flanges bolted to metal surfaces and welded to railing ends or connected to railing ends using nonwelded connections.

C. Attach railings to wall with wall brackets, except where end flanges are used. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.

D. Secure wall brackets and railing end flanges to building construction as follows:

1. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
2. For wood stud partitions, use hanger or lag bolts set into studs or wood backing between studs. Coordinate with carpentry work to locate backing members.

3.6 ADJUSTING AND CLEANING

A. Touchup Painting: 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 to comply with SSPC-PA 1 requirements for touching up shop-painted surfaces.

1. Apply by brush or spray to provide a minimum 2.0-mil (0.05-mm) dry film thickness.

B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Section 099113 "Exterior Painting."

C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas, and repair galvanizing to comply with ASTM A 780/A 780M.

3.7 PROTECTION

A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

END OF SECTION 055213

SECTION 061000 - ROUGH CARPENTRY

PART 1 - GENERAL

1.01 SUMMARY:

A. Work Includes: The complete furnishing and installation of the following:

1. Structural wood framing with dimension lumber and timbers
2. Framing with engineered wood products
3. Framing with glued-laminated timbers
4. Rooftop equipment bases and support curbs.
5. Wood blocking, cants and nailers.
6. Wood furring
7. Wood sleepers
8. Structural sheathing

1.02 QUALITY ASSURANCE:

A. Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Special Inspection: Inspection and testing shall be performed in accordance with CBC Chapter 17A and as delineated in the Statement of Special Inspections.

C. Comply with the references listed below; when an edition (year) is not listed, comply with the most current edition.

1.03 REFERENCES:

A. NDS-18: National Design Specification (NDS) for Wood Construction with 2018 Supplement, by the American Forest & Paper Association (AF&PA).

B. SDPWS-21: Special Design Provisions for Wind and Seismic, by the AF&PA.

C. PS 1: Structural Plywood, by the U.S. Department of Commerce (DOC)

D. PS 2: Performance Standard for Wood-based Structural-use Panels, by the DOC.

E. PS 20: American Softwood Lumber Standard, by the DOC.

F. 2022 *California Building Code* (CBC) Title 24, with amendments for DSA/SS.

G. Applicable or referenced materials and testing standards by the American Society of Testing Materials (ASTM).

1.04 SUBMITTALS:

A. Comply with the requirements of Division 1.

B. Product Data: For each type of process, factory-fabricated product, anchors, connectors, and fasteners.

C. Research/Evaluation Reports – for the following, showing compliance with building code in effect for Project:

1. Engineered wood products.
2. Power-driven fasteners.
3. Powder-actuated fasteners.
4. Expansion anchors.
5. Metal framing anchors and connectors.
6. Other hardware

D. Data for wood-preservative and fire-retardant treatment (when applicable) from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements.

E. AITC Certificate of Compliance for glued-laminated timbers

F. Sheathing type and grade for each application.

G. Lumber grade and species for each application.

H. Manufacturer's installation requirements and recommendations, and maintenance instructions.

PART 2 - PRODUCTS

2.01 WOOD PRODUCTS, GENERAL:

A. Lumber: Per DOC PS 20 or equivalent and applicable rules of grading agencies indicated.

1. WCLIB or WWPA grading agency, approved by the ALSC Board of Review.
2. Factory mark each piece of lumber with grade stamp of grading agency.
3. Provide dressed lumber, S4S, unless otherwise indicated.
4. Douglas Fir-Larch (DF), unless specifically noted otherwise. (Hem-Firm, Douglas Fir-Larch-North, Douglas Fir-South, and Pines are not allowed under this Section.)

B. Engineered Wood Products:

1. Provide engineered wood products acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project. Refer to related Sections.
2. Allowable Design Stresses: Provide engineered wood products with allowable design stresses, as published by manufacturer, which meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

2.02 PRESERVATIVE-TREATED WOOD:

A. Preservative Treatment by Pressure Process, shall conform to AWPA Standards. Additionally:

1. ACQ-treated wood or approved equal shall be used, except where borate-treated wood is allowed.
2. Borate-treated wood may be used for interior dry conditions (such as a sill plate or ledger that will be covered and weatherproofed). Borate-treated wood may not be used where it may come into contact with soil, moisture or liquid water. ACQ-treated wood must be used when in contact with concrete stemwalls, footings, gradebeams, foundations, or slabs that are in contact with soil, and shall be used for sill plates in walls around and within restrooms and utility/janitor closets.
3. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.

B. Kiln-dry lumber after treatment to a maximum moisture content of 14%.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

D. Application: Treat items indicated on the construction documents, and the following:

1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
2. Wood sills, sleepers, blocking, furring, and similar concealed members in contact with masonry or concrete.
3. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.
4. Wood framing 4x and smaller members that are less than 18 inches above the ground in crawlspaces or unexcavated areas.
5. Wood framing 6x and larger members supporting wood joists (i.e. girders) that are less than 12 inches above the ground in crawlspaces or unexcavated areas.
6. Wood floor plates that are installed over concrete slabs-on-grade.

2.03 FIRE-RETARDANT-TREATED WOOD:

A. General: Use where indicated in the construction documents.

1. Comply with performance requirements in AWPA C20 (lumber) and AWPA C27 (plywood).
2. Use Exterior type for exterior locations and where indicated.
3. Use Interior Type A, High Temperature (HT) for enclosed roof framing, framing in attic spaces, and where indicated.
4. Use Interior Type A, unless otherwise indicated.

B. Identify fire-retardant-treated wood with appropriate classification marking of testing and inspecting agency acceptable to authorities having jurisdiction.

2.04 DIMENSION LUMBER FRAMING:

A. Moisture Content: 19% maximum, except where kiln-dried or other moisture content is

indicated.

B. Grades shall be as indicated on the construction documents, with minimum as follows or better:

1. 1x, 2x, and 3x: No. 2
2. 4x and larger: No. 1

C. Exposed Framing (Indicated to Receive a Stained or Natural Finish): Provide material hand-selected for uniformity of appearance and freedom from characteristics, on exposed surfaces and edges, that would impair finish appearance, including decay, honeycomb, knot-holes, shake, splits, torn grain, and wane. Use Species and Grade as indicated above for structural framing of same type. Use better and/or architectural grade when required by the Owner or Architect.

2.05 WOOD STRUCTURAL PANELS (or "SHEATHING"):

A. Shall conform to the requirements for their type in DOC PS 1 or PS 2.

B. Each panel shall be identified for grade and glue type by the trademarks of an approved testing and grading agency.

C. Minimum thicknesses are per the drawings.

D. Panel Index (PI) or "Roof/Floor span rating" is per the drawings, however it shall not be less than the following:

1. 48/24 for floor sheathing.
2. 24/16 for roof sheathing.

E. Where sheathing may be subjected to repeated wetting and redrying or long-term exposure to weather or similar conditions:

1. "Exterior Plywood" – Grade C-C or Structural 1 C-C with exterior glue

F. Where sheathing will not be subjected to repeated wetting and redrying or long-term exposure to weather or similar conditions:

1. Plywood – Grade C-D with exterior glue (or "CDX"), Exposure 1.
2. Composite Panel, Oriented Strand Board (OSB), or other Mat-Formed Structural-Use Panel – Grade Structural 1, Exposure 1.

G. Where "Structural 1" (or "Struct 1" or "ST1") is required per the plans, use Grade Structural 1 sheathing per PS 1 or PS 2.

2.06 ENGINEERED WOOD PRODUCTS:

A. Laminated-Veneer Lumber (LVL): Structural composite lumber made from wood veneers with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D5456 and manufactured with an exterior-type adhesive complying with ASTM D2559 and containing no urea formaldehyde.

1. Manufactured by:
   a. Weyerhaeuser
   b. Roseburg Forest Products.
   c. Standard Structures, Inc.
   d. Approved equal.
2. Properties:
   a. Extreme Fiber Stress in Bending, Edgewise: 2600 psi for 12-inch nominal-depth members.
   b. Modulus of Elasticity, Edgewise: 1,900,000 psi
   c. Specific Gravity: 0.50
   d. Thickness: 1¾" inches minimum.
3. Parallam PSL by Weyerhaeuser or Approved Equal may be used in lieu LVL.

B. I-Joists: "TJI" I-Joists have been used as the basis of design, and have therefore been indicated on the drawings. Joists by other manufacturers with equal or greater design properties and with ICC and DSA approval shall be considered as alternatives, subject to verification and approval by the Owner and DSA. "TJI" I-Joists are manufactured by Weyerhaeuser, ICC Evaluation Service Report ESR-1153 for *TJI Prefabricated Wood I-Joists*.

2.07 GLUED-LAMINATED TIMBER (or "GLULAM" or "GLB"):

A. Grade:

1. Simple Span Beams: 24F-1.8E (24F-V4)
2. Cantilevered Beams: 24F-1.8E Balanced-Layup (24F-V8)
3. Columns and Truss Members: L2 or 24F-V8

B. Species: Douglas-Fir (DF)

C. Members, or portions thereof, that are exposed to weather and not fully protected from moisture by roof, eave or similar covering shall be preservative-treated or be manufactured from naturally-durable wood. Exterior members shall be considered for "wet service" and interior protected members shall be considered for "dry service" conditions.

D. When preservative treatment is required, the manufacturer shall submit the proposed preservative material and retention quantity for review and approval prior to manufacture.

E. If a species other than DF is used, such as Alaska Cedar (AC) for weather exposure requirements, then contact the Engineer for conformance with stress and deflection requirements.

F. Beams shall have factory standard camber, except where noted otherwise on the plans. Camber radius shall be 5,000 feet or less, unless noted otherwise. (Note that camber increases as the radius decreases.) Cantilevered portions of beams shall not be cambered.

G. Members shall be manufactured and identified as required in ANSI/AITC A190.1 and ASTM D3737. Members shall be protected during shipping and field handling in accordance with AITC 111.

H. Special inspection of manufacturing is required per CBC Title 24 Section 1705A.5.5, unless

the members meet the exception therein.

2.08 MISCELLANEOUS LUMBER:

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.
2. Nailers.
3. Cants.
4. Furring
5. Rooftop equipment bases and support curbs, unless prefabricated metal units are installed that do not require wood base or curbs (except for blocking between framing).

B. For items of dimension lumber size, provide Stud or No. 2 or better grade lumber with 19% maximum moisture content; Douglas Fir-Larch; WCLIB or WWPA.

2.09 FASTENERS:

A. General:

1. Provide fasteners of size and type indicated that comply with requirements specified.
2. Where fasteners are exposed to weather, soil, moisture, preservative-treated wood, fire-retardant-treated wood, or in an area of high relative humidity, they shall be of hot-dipped zinc-coated galvanized steel or stainless steel.
3. Number and size of fasteners connecting wood members shall not be less than that set forth in 2022 CBC Title 24 Table 2304.10.2 Fastening Schedule.

B. Nails:

1. ASTM F1667
2. “Common” refers to common steel wire nails or spikes. “Sinker” refers to steel sinker nails. “Box” refers to steel box nails.
3. Lengths of nails shall be sufficient to provide at least 10 diameters embedment into the main member, except that when attaching sheathing, minimum embedment into main member shall be 1½” for 10d nails or 1⅜” for 8d nails.
4. Conform with the following diameters (per NDS), unless noted otherwise:
   a. 20d Common: 0.192”
   b. 20d Sinker: 0.177”
   c. 20d Box: 0.148”
   d. 16d Common: 0.162”
   e. 16d Sinker: 0.148”
   f. 16d Box: 0.135”
   g. 10d Common: 0.148”
   h. 10d Sinker: 0.120”
   i. 10d Box: 0.128”
   j. 8d Common: 0.131”
   k. 8d Sinker: 0.113”
   l. 8d Box: 0.113”

C. Power-Driven Fasteners: NES NER-272.

D. Bolts: Steel bolts complying with ASTM A307, with ASTM A563 hex nuts and flat washers, unless noted otherwise. Plate washers conforming to ASTM A36 are required where indicated on the drawings.

E. Threaded Rods: Carbon steel conforming to ASTM A307 Grade C or ASTM A193 Grade B7; or stainless steel conforming to ASTM F593 Alloy Group 1 Type 304 Condition CW.

F. Powder-Actuated Fasteners (or "Shotpins"):

1. Preservative-treated or fire-retardant-treated Wood: PDPWL-300MG by Simpson Strong-Tie, or Approved Equal.
2. Untreated Wood: PDPWL-300 by Simpson Strong-Tie, or Approved Equal.
3. Per ICC-ES ESR-2138, or Approved Equal's ICC-ES Report.
4. 0.145 in. dia. x 3 in. long headed fastener with 1 in. dia. washers.

2.10 METAL FRAMING ANCHORS:

A. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include: Simpson Strong-Tie Co., KC Metals Products, Inc., or Approved Equal.

B. Design: Simpson Strong-Tie Co. products were used as the basis of design. Product callouts on construction documents refer to Simpson Strong-Tie model number. Provide products with allowable design loads, as published by manufacturer and ICC evaluation report, which meet or exceed those by Simpson Strong-Tie Co. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

C. Galvanized Steel Sheet: Zinc-coated complying with ASTM A653, minimum G60 coating.

D. Connectors exposed to weather, soil, or in contact with ACQ treated wood shall have minimum G185 zinc coating, be hot-dip galvanized, or be stainless steel.

2.11 MISCELLANEOUS STEEL:

A. Where steel plates, sections, fabricated connectors or other miscellaneous steel elements or fabrications are shown in the drawings or otherwise required in the project (but a separate Section 051200 is not included), then provide as follows, provide as follows:

1. Conform to requirements of ASTM and fabricate according to AISC and AWS standards.
2. Special inspection of welding and material verification are required.
3. ASTM A36, A572 Grade 50, or Type 304 Stainless Steel, unless noted otherwise in the plans.
4. Hollow Structural Sections (HSS): ASTM A500 Grade B (Fy = 46 ksi).
5. Sections, plates, and bars shall not be sheared – they shall be gas-cut or saw-cut.
6. Steel exposed to weather, moisture, or soil must be hot dip galvanized or stainless steel.
7. Provide vent holes in end plates of hollow sections or fabrications that are to be hot dip galvanized.
8. Bolt holes shall be AISC "standard holes." Do not oversize or slot.
9. Finishes are per the Architect.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. General Requirements:

1. Fabricate, size, install, connect, fasten, bore, notch, and cut wood and sheathing with joints true, tight, and well-nailed, screwed or bolted as required; members to have solid bearing without being shimmed, unless noted otherwise. Set horizontal members subject to bending with the crown up. Install framing plumb, square, true and cut for full bearing. Splices are not permitted between bearings. Use full lengths unless otherwise specified.
2. Notching, drilling, splicing, or cutting of any structural member is not permitted without prior approval. Reinforce or replace wood framing members damaged by erroneous cutting as directed by the Engineer. Whenever necessary to avoid splitting, sub-drill (pre-drill) for nails and screws with the diameter of the hole smaller than that of nails or screws.
3. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Perform cutting for other trades under the direction of trade involved. Locate furring, nailers, blocking, ledgers, and similar supports to comply with requirements for attaching other construction.
4. Do not splice structural members between supports, unless otherwise indicated.
5. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated on the construction documents.
6. Comply with 2022 CBC Title 24 details for conventional light frame construction, except where indicated.

B. Sheathing:

1. Nail as specified on the plans with perimeter nails not closer than ½” from the edges. Do not overdrive nails through the face grain.
2. Install with the face grain across supports, end supports staggered and the edges of sheets centered over supports. Provide minimum 2x thick blocking of the same depth as the joists or 3x4 flat blocking under all plywood edges, except that full-depth blocking is required under walls.
3. Where new sheathing is installed over existing 1x sheathing, sheets need to be staggered; attach new sheathing with full length common nails through the 1x sheathing into the solid framing and blocking underneath all edges and at field nailing.
4. Provide cant strips and saddles where shown or necessary to pitch water to drain.
5. Sheathing installation shall conform to APA recommendations.
6. Use of machine nailing is subject to a satisfactory jobsite demonstration and the approval of the Owner’s Representative, Architect, or Engineer. The approval is subject to continued satisfactory performance. Machine nailing is not allowed for 5/16” or thinner sheathing. If the nail heads penetrate the outer ply by more than would be normal for a hand-held hammer, or if minimum allowed edge distances are not maintained, the performance will be deemed unsatisfactory and machine nailing shall be discontinued.

C. Fasteners:

1. Lag Screws: Install with the base of the head flush with the surface of the connected member. Bore lead holes approximately ¾ of diameter and same depth as shank (except

when not required by the manufacturer, such as for Simpson SDS Screws). Provide a standard washer under the head of the lag when bearing upon wood. Install by using a wrench, not by driving with a hammer. Soap or other lubricant shall be used on the lag screws or in the lead holes to facilitate insertion and prevent damage to the lag screws. Locate lag screws on centerline of member (e.g. block, rim, joist) unless shown otherwise.

2. Bolts: Drill bolt holes 1/32" to 1/16" larger than bolt diameter such that bolts fit tight. Provide standard washers under the heads and nuts when bearing upon wood. Holdown bolts shall be torqued tight just prior to covering the wall. The inspector shall verify that bolts are installed tight.
3. Powder-Actuated Fasteners (or “Shotpins”):
   a. May be used for attachment of miscellaneous furring, framing, and interior non-bearing stud wall sill plates to concrete or masonry.
   b. Sill plates shall have fasteners placed at 6” from ends and at a spacing of 16” o.c. or less.
   c. Install per the fastener’s ICC-ES Report and with minimum 1¼” embedment, unless noted otherwise.
4. Nails shall not be driven closer together than ½ their length nor closer to the edge or end of lumber than ¼ their length (except for sheathing). The penetration of nails or spikes into pieces receiving the point shall not be less than ½ the nail length, except that 16d may be used to connect pieces of 2x. Use “common” nails unless noted otherwise.
5. Comply with the 2022 CBC Title 24 Table 2304.10.2 Fastening Schedule.

D. Sill Plates on Concrete or Masonry:

1. Lumber bearing on concrete or masonry shall be pressure preservative treated wood.
2. Refer to Section 033000 – Cast-In-Place Concrete for additional Sill Plate Anchorage requirements. Shearwall and other wall anchorage to concrete or masonry requires coordination between foundation and framing construction disciplines. Rough carpentry specifications related to framing at the interface of existing or new concrete may be contained only within Section 033000. General contractor shall coordinate all construction disciplines (subs).

E. Wood Stud Walls:

1. Walls, Partitions, and Furring: Use studs of sizes and spacings shown on the drawings, with single plate at bottom (sill plate) and doubled-plate at top (top plates), unless otherwise shown. Stagger joints in double members at top plate by at least four feet. Splice per the detail(s) on the drawings.
2. Blocking: Provide at least one row of minimum 2x thick blocking of same width as stud, fitted snugly and spiked into studs at mid-height of walls over 8’-0” high. Space blocking at a maximum of 8’-0” o.c. Cripple walls (or “pony walls”) less than 14" in height shall be solid blocking. Refer to shearwall detailing and notes for additional blocking requirements at shearwalls. Refer to the architectural drawings and specifications for other additional blocking requirements.
3. Notching: In exterior and bearing walls, notches in studs shall not exceed 25% of the stud depth (⅞” for 2x4 and 1⅜” for 2x6). Non-bearing partition walls may be notched not greater than 40% of the stud depth (1⅜” for 2x4 and 2¼” for 2x6).
4. Drilling Holes: In exterior and bearing walls, holes in studs shall not exceed 40% of stud depth. Non-bearing partition walls may be drilled not greater than 60% of stud depth.

5. Angles and Overhangs: Form corners, and where stud partitions and wood vertical furring meet with blocked triple studs or as detailed. Form openings in wood partitions with double studs at each side, and 4x or 6x headers across top resting on trimmer studs at each end. Headers shall be 4x4 or 6x6 unless otherwise noted on the plans.
6. Bearing: Provide a minimum of 1½" of bearing for headers unless noted otherwise on plans. Members bearing on prefabricated hangers are to have full bearing and nailing per manufacturer's specifications.
7. Top Plates: Where top plates are notched or drilled, strap at least one side with (2) Simpson RPS straps. Length of strap and installation are per the manufacturer's specifications.
8. Sole Plates: At double sole (sill) plates on wood floors, nail second sole plate to first sole plate with 2-10d @ 8" o.c., unless noted otherwise.

F. I-Joists:

1. Installation shall be in accordance with the ICC evaluation report, and per the manufacturer's written specifications and installation guide.
2. Shall not be used in exterior conditions or where exposed to weather or moisture, unless fully protected from moisture per the architect's details and specifications.
3. Do not cut, notch, or drill without specific written approval of the manufacturer.
4. Minimum bearing at end supports is 1¾" and at intermediate supports is 3½", unless noted otherwise. Lateral support of joists at bearing points is required with full depth blocking or rim board, per manufacturer specifications.
5. Provide web stiffeners to I-joists at bearing supports unless specifically noted otherwise.
6. Install full-depth blocking where required by the manufacturer and under all perpendicular walls.
7. Install double-joists under parallel walls.
8. Rim boards shall be minimum 1½" thick members, minimum.

G. Roof and Ceiling Framing:

1. Provide rafters, joists, and purlins as shown on the drawings. Place with crown edge up.
2. Bridging/Blocking: Provide min. 2x thick solid wood blocking, cut in between and the same depth as the joists at a spacing of no greater than 8-ft. on-center. Provide blocking at all plywood panel edges.

H. Posts on upper levels shall be stacked on posts of equal size at levels below, unless a larger post is specified on the plans. Blocking shall be used to fully transfer the post area through floors. This arrangement shall continue until the post is supported by a designed beam or the foundations. Posts inside walls shall bear on sill plates and isolated posts shall be seated in PB or CB or similar metal bases. Posts shall be continuous between top and bottom plates, unless specifically noted otherwise. Headers framing into continuous posts without trimmer studs shall be supported in HUC hangers.

I. LVL Framing:

1. Comply with manufacturer's written instructions and with the approved ICC evaluation report.
2. Beams shall comprise of multiple 1¾" thick members and be connected with 16d common nails, ½" bolts, or ¼" lag screws (e.g. Simpson SDS screws) in accordance with the manufacturer's specifications. If thicker LVL beams are available from the

manufacturer (e.g. Roseburg Forest Products), a single solid piece may be used in lieu connecting multiple 1¾" thick pieces.

3. Beam bearing shall be 1½" minimum length and the full width of the beam. Lateral support of beams at bearing points is required. Additionally, lateral support of beam compression edge is required at 24" o.c. if sheathing is not directly attached.
4. Nailing down into the top edge of an LVL beam shall not be spaced any closer than 6" for 16d common, 4" for 10d common, and 3" for 8d common. When nailing must be reduced, stagger rows ½" apart minimum while maintaining minimum required edge distances.

J. Metal Framing Anchors:

1. Install metal framing to comply with manufacturer's written instructions and the applicable ICC evaluation report.
2. Provide the type of nails specified by the manufacturer and fully drive nails into all holes of the connector unless noted otherwise on plans.
3. Where A35 or LTP4 clips are placed directly against the framing, 1½" long nails are acceptable; where these clips are placed over plywood, use full-length common nails through plywood into framing.
4. Use LTP5 connectors in lieu of LTP4 connectors when all nails in the LTP4 cannot be driven into solid wood framing, such as when bridging over roof or floor sheathing.

K. Shearwalls:

1. Shearwall type and nailing are per the drawings. See shearwall schedule on drawings.
2. Shearwalls shall extend horizontally between openings unless noted otherwise and shall extend through attics to the roof diaphragm. Shearwall lengths shown on plans are minimum required.
3. Shear transfer mechanism to framing above and to framing or foundation below are per the drawings.
4. Sheathing shall be nailed with common nails or with hot-dipped (or tumbled) galvanized box nails. Edge nails shall have a minimum ½" edge distance.
5. 3x framing, as noted on the shearwall schedule on the drawings, is required as follows, except where 2x is specifically allowed:
   a. Studs and blocking at adjoining panel edges (joints)
   b. Sill plates on masonry or concrete.
   c. Sill plates at two-sided shearwalls, i.e. sheathing on both sides.
   d. Double 2x members spiked with 2-16d at 4" o.c. with boundary nails staggered between alternate 2x members may be used in lieu of a 3x.
6. At 3x framing, stagger edge nails.
7. Nails in preservative-treated wood (including foundation sill plates) shall be of hot-dipped zinc-coated galvanized steel or stainless steel, unless the wood is Borate-treated.
8. Sheathing panels shall be 2 feet wide minimum.

L. Comply with AWPA requirements for applying field treatment to cut surfaces of preservative-treated lumber.

3.02 MISCELLANEOUS STEEL:

A. Welding shall be in accordance with all AISC and AWS specifications, performed by

certified welders.

B. Testing and Inspecting: Contractor shall engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

C. Exposed welds shall be filled and ground smooth where metal will come in contact with the public, unless reasonably smooth and uniform welds have been provided. Additional finish requirements are per the Owner and Architect.

D. Bolt holes shall be AISC “standard holes.” Do not oversize or slot.

E. No holes other than those specifically detailed shall be allowed through structural steel members. No cutting or burning of structural steel will be permitted without prior consent of the Engineer.

F. Steel exposed to weather, soil, or moisture shall be galvanized or have similar corrosion protection. Steel embedded in concrete shall have the same cover requirements as for reinforcing steel (rebar), unless the embedded steel is galvanized or has similar corrosion protection. Finishing requirements for exposed steel are per the Architect.

G. Repair defective elements where required by the Owner, Architect, Engineer, or DSA. Remove and replace elements that cannot be repaired to Owner, Architect, Engineer, or DSA’s approval. Any repair or replacement shall be at no additional cost to the Owner.

3.03 FIELD QUALITY CONTROL:

A. Special Inspections: Refer to the Structural Title Sheet. Contractor shall engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Correct deficiencies in Work that inspections indicate does not comply with the Contract Documents.

C. Repair defective elements where required by the Owner, Architect, Engineer, or DSA. Remove and replace elements that cannot be repaired to Owner, Architect, Engineer, or DSA's approval. Any repair or replacement shall be at no additional cost to the Owner.

END OF SECTION 061000

SECTION 061600 - SHEATHING

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. Wall sheathing.
2. Roof sheathing.
3. Composite nail base insulated roof sheathing.
4. Underlayment.
5. Sheathing joint and penetration treatment.

B. Related Requirements:

1. Section 061000 "Rough Carpentry" for plywood backing panels.
2. Section 072500 "Weather Barriers" for water-resistive barrier applied over wall sheathing.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements. Indicate type of preservative used and net amount of preservative retained.
2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements. Include physical properties of treated materials.
3. For fire-retardant treatments, include physical properties of treated plywood both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5516.
4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
5. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

1.4 INFORMATIONAL SUBMITTALS

A. Evaluation Reports: For following products, from ICC-ES:

1. Preservative-treated plywood.
2. Fire-retardant-treated plywood.

1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant-treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Stack panels flat with spacers beneath and between each bundle to provide air circulation. Protect sheathing from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: For assemblies with fire-resistance ratings, provide materials and construction identical to those of assemblies tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.

1. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory.".

2.2 WOOD PANEL PRODUCTS

A. Emissions: Products shall meet the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

B. Certified Wood: For the following wood products, provide materials produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship":

1. Plywood.
2. Oriented strand board.
3. Fiberboard wall sheathing.
4. Particleboard underlayment.
5. Hardboard underlayment.

C. Plywood: Either DOC PS 1 or DOC PS 2 unless otherwise indicated.

D. Oriented Strand Board: DOC PS 2.

E. Thickness: As needed to comply with requirements specified, but not less than thickness indicated.

F. Factory mark panels to indicate compliance with applicable standard.

2.3 PRESERVATIVE-TREATED PLYWOOD

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with the ground, Use Category UC3b for exterior construction not in contact with the ground, and Use Category UC4a for items in contact with the ground.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.

B. Mark plywood with appropriate classification marking of an inspection agency acceptable to authorities having jurisdiction.

C. Application: Treat items indicated on Drawings and plywood in contact with masonry or concrete or used with roofing, flashing, vapor barriers, and waterproofing.

2.4 FIRE-RETARDANT-TREATED PLYWOOD

A. General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this article that are acceptable to authorities having jurisdiction and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.

B. Fire-Retardant-Treated Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet (3.2 m) beyond the centerline of the burners at any time during the test.

1. Use treatment that does not promote corrosion of metal fasteners.
2. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.
3. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.
4. Design Value Adjustment Factors: Treated lumber plywood shall be tested according ASTM D 5516 and design value adjustment factors shall be calculated according to ASTM D 6305. Span ratings after treatment shall be not less than span ratings specified. For roof sheathing and where high-temperature fire-retardant treatment is

indicated, span ratings for temperatures up to 170 deg F (76 deg C) shall be not less than span ratings specified.

C. Kiln-dry material after treatment to a maximum moisture content of 15 percent. Do not use material that is warped or does not comply with requirements for untreated material.

D. Identify fire-retardant-treated plywood with appropriate classification marking of qualified testing agency.

E. Application: Treat plywood indicated on Drawings, and the following:

1. Roof and wall sheathing within 48 inches (1220 mm) of party walls.
2. Roof sheathing.

2.5 WALL SHEATHING

A. Plywood Wall Sheathing: Exterior, Structural I sheathing.

1. Span Rating: Not less than 20/0.
2. Nominal Thickness: Not less than 3/8 inch (9.5 mm).

B. Oriented-Strand-Board Wall Sheathing: Exposure 1, Structural I sheathing.

1. Span Rating: Not less than 24/0.
2. Nominal Thickness: Not less than 3/8 inch (9.5 mm).

C. Paper-Surfaced Gypsum Wall Sheathing: ASTM C 1396/C 1396M, gypsum sheathing; with water-resistant-treated core and with water-repellent paper bonded to core's face, back, and long edges.

1. Manufacturers: Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:

   a. American Gypsum.
   b. G-P Gypsum Corporation.
   c. LaFarge North America Inc.
   d. National Gypsum Company.
   e. Temple-Inland Inc.
   f. United States Gypsum Co.

2. Type and Thickness: Regular, 1/2 inch (13 mm) thick.
3. Edge and End Configuration: Square.
4. Size: 48 by 96 inches (1219 by 2438 mm) for vertical installation.

D. Glass-Mat Gypsum Wall Sheathing: ASTM C 1177/1177M.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. CertainTeed Corporation; GlasRoc.
b. G-P Gypsum Corporation; Dens-Glass Gold.
c. National Gypsum Company; Gold Bond e(2)XP.
d. Temple-Inland Inc.; GreenGlass
e. United States Gypsum Co.; Securock.

2. Type and Thickness: Regular, 1/2 inch (13 mm) thick.
3. Size: 48 by 96 inches (1219 by 2438 mm) for vertical installation.

E. Cellulose Fiber-Reinforced Gypsum Sheathing: ASTM C 1278/C 1278M, gypsum sheathing.

1. Product: Subject to compliance with requirements, provide "Fiberock Sheathing with Aqua-Tough" by United States Gypsum Co.
2. Type and Thickness: Regular, 1/2 inch (13 mm) thick.
3. Size: 48 by 96 inches (1219 by 2438 mm).

F. Cementitious Backer Units: ASTM C 1325, Type A.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. C-Cure; C-Cure Board 990.
b. Custom Building Products; Wonderboard.
c. FinPan, Inc.; Util-A-Crete Concrete Backer Board.
d. USG Corporation; DUROCK Cement Board.

2. Thickness: 1/2 inch (12.7 mm).

G. Fiberboard Wall Sheathing: ASTM C 208, Type IV, Grade 1 (Regular) Grade cellulosic fiberboard sheathing with square edges, 1/2 inch (13 mm) thick.

2.6 ROOF SHEATHING

A. Plywood Roof Sheathing: Exterior, Structural I sheathing.

1. Span Rating: Not less than 24/0.
2. Nominal Thickness: Not less than 1/2 inch (13 mm).

B. Oriented-Strand-Board Roof Sheathing: Exposure 1, Structural I sheathing.

1. Span Rating: Not less than 24/0.
2. Nominal Thickness: Not less than 1/2 inch (13 mm).

2.7 COMPOSITE NAIL BASE INSULATED ROOF SHEATHING

A. Oriented-Strand-Board-Surfaced, Polyisocyanurate-Foam Sheathing: Rigid, cellular, polyisocyanurate thermal insulation with oriented strand board laminated to one face complying with ASTM C 1289, Type V.

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. Atlas Roofing Corporation.
    b. Cornell Corporation.
    c. Dow Chemical Company (The).
    d. Johns Manville; Berkshire Hathaway Inc.
    e. Rmax, Inc.

2. Oriented-Strand-Board Nominal Thickness: 5/8 inch (15.9 mm).

B. Vented, Oriented-Strand-Board-Surfaced, Polyisocyanurate-Foam Sheathing: Rigid, cellular, polyisocyanurate thermal insulation complying with ASTM C 1289, Type II, Class 1, with oriented strand board adhered to spacers on one face.

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. Atlas Roofing Corporation.
    b. Cornell Corporation.
    c. Dow Chemical Company (The).
    d. Johns Manville; Berkshire Hathaway Inc.
    e. Rmax, Inc.

2. Oriented-Strand-Board Nominal Thickness: 5/8 inch (15.9 mm).
3. Spacers: Wood furring strips or blocks not less than 3/4 inch (19 mm) thick and spaced not more than 16 inches (400 mm) o.c.

2.8 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

1. For roof and wall sheathing, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

B. Nails, Brads, and Staples: ASTM F 1667.

C. Power-Driven Fasteners: NES NER-272.

D. Wood Screws: ASME B18.6.1.

E. Screws for Fastening Wood Structural Panels to Cold-Formed Metal Framing: ASTM C 954, except with wafer heads and reamer wings, length as recommended by screw manufacturer for material being fastened.

1. For wall and roof sheathing panels, provide screws with organic-polymer or other corrosion-protective coating having a salt-spray resistance of more than 800 hours according to ASTM B 117.

F. Screws for Fastening Gypsum Sheathing to Cold-Formed Metal Framing: Steel drill screws, in length recommended by sheathing manufacturer for thickness of sheathing to be attached, with organic-polymer or other corrosion-protective coating having a salt-spray resistance of more than 800 hours according to ASTM B 117.

1. For steel framing less than 0.0329 inch (0.835 mm) thick, use screws that comply with ASTM C 1002.
2. For steel framing from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick, use screws that comply with ASTM C 954.

G. Screws for Fastening Oriented-Strand-Board-Surfaced, Polyisocyanurate-Foam Sheathing to Metal Roof Deck: Steel drill screws, in type and length recommended by sheathing manufacturer for thickness of sheathing to be attached, with organic-polymer or other corrosion-protective coating having a salt-spray resistance of more than 800 hours according to ASTM B 117. Provide washers or plates if recommended by sheathing manufacturer.

2.9 SHEATHING JOINT-AND-PENETRATION TREATMENT MATERIALS

A. Sealant for Paper-Surfaced Gypsum Sheathing: Elastomeric, medium-modulus, neutral-curing silicone joint sealant compatible with joint substrates formed by gypsum sheathing and other materials, recommended by sheathing manufacturer for application indicated and complying with requirements for elastomeric sealants specified in Section 079200 "Joint Sealants."

B. Sealant for Glass-Mat Gypsum Sheathing: Silicone emulsion sealant complying with ASTM C 834, compatible with sheathing tape and sheathing and recommended by tape and sheathing manufacturers for use with glass-fiber sheathing tape and for covering exposed fasteners.

1. Sheathing Tape: Self-adhering glass-fiber tape, minimum 2 inches (50 mm) wide, 10 by 10 or 10 by 20 threads/inch (390 by 390 or 390 by 780 threads/m), of type recommended by sheathing and tape manufacturers for use with silicone emulsion sealant in sealing joints in glass-mat gypsum sheathing and with a history of successful in-service use.

C. Sheathing Tape for Foam-Plastic Sheathing: Pressure-sensitive plastic tape recommended by sheathing manufacturer for sealing joints and penetrations in sheathing.

2.10 MISCELLANEOUS MATERIALS

A. Adhesives for Field Gluing Panels to Framing: Formulation complying with ASTM D 3498 that is approved for use with type of construction panel indicated by manufacturers of both adhesives and panels.

1. Adhesives shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2. Adhesives shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.

B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.

C. Securely attach to substrate by fastening as indicated, complying with the following:

1. NES NER-272 for power-driven fasteners.
2. Table 2304.9.1, "Fastening Schedule," in ICC's "International Building Code."
3. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's "International Residential Code for One- and Two-Family Dwellings."

D. Use common wire nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections. Install fasteners without splitting wood.

E. Coordinate wall and roof sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.

F. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

G. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

3.2 WOOD STRUCTURAL PANEL INSTALLATION

A. General: Comply with applicable recommendations in APA Form No. E30, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.

B. Fastening Methods: Fasten panels as indicated below:

1. Combination Subfloor-Underlayment:

a. Glue and nail to wood framing.
b. Screw to cold-formed metal framing.

c. Space panels 1/8 inch (3 mm) apart at edges and ends.

2. Wall and Roof Sheathing:

a. Nail or staple to wood framing. Apply a continuous bead of glue to framing members at edges of wall sheathing panels.
b. Screw to cold-formed metal framing.
c. Space panels 1/8 inch (3 mm) apart at edges and ends.

3.3 GYPSUM SHEATHING INSTALLATION

A. Comply with GA-253 and with manufacturer's written instructions.

1. Fasten gypsum sheathing to wood framing with nails or screws.
2. Fasten gypsum sheathing to cold-formed metal framing with screws.
3. Install boards with a 3/8-inch (9.5-mm) gap where non-load-bearing construction abuts structural elements.
4. Install boards with a 1/4-inch (6.4-mm) gap where they abut masonry or similar materials that might retain moisture, to prevent wicking.

B. Apply fasteners so heads bear tightly against face of sheathing, but do not cut into facing.

C. Horizontal Installation: Install sheathing with V-grooved edge down and tongue edge up. Interlock tongue with groove to bring long edges in contact with edges of adjacent boards without forcing. Abut ends of boards over centers of studs, and stagger end joints of adjacent boards not less than one stud spacing. Attach boards at perimeter and within field of board to each steel stud.

1. Space fasteners approximately 8 inches (200 mm) o.c. and set back a minimum of 3/8 inch (9.5 mm) from edges and ends of boards.
2. For sheathing under stucco cladding, boards may be initially tacked in place with screws if overlying self-furring metal lath is screw-attached through sheathing to studs immediately after sheathing is installed.

D. Vertical Installation: Install board vertical edges centered over studs. Abut ends and edges of each board with those of adjacent boards. Attach boards at perimeter and within field of board to each stud.

1. Space fasteners approximately 8 inches (200 mm) o.c. and set back a minimum of 3/8 inch (9.5 mm) from edges and ends of boards.
2. For sheathing under stucco cladding, boards may be initially tacked in place with screws if overlying self-furring metal lath is screw-attached through sheathing to studs immediately after sheathing is installed.

E. Seal sheathing joints according to sheathing manufacturer's written instructions.

1. Apply elastomeric sealant to joints and fasteners and trowel flat. Apply sufficient amount of sealant to completely cover joints and fasteners after troweling. Seal other penetrations and openings.

2. Apply glass-fiber sheathing tape to glass-mat gypsum sheathing joints and apply and trowel silicone emulsion sealant to embed entire face of tape in sealant. Apply sealant to exposed fasteners with a trowel so fasteners are completely covered. Seal other penetrations and openings.

3.4 CEMENTITIOUS BACKER UNIT INSTALLATION

A. Install panels and treat joints according to ANSI A108.11 and manufacturer's written instructions for type of application indicated.

3.5 FIBERBOARD SHEATHING INSTALLATION

A. Comply with ASTM C 846 and with manufacturer's written instructions.

B. Fasten fiberboard sheathing panels to intermediate supports and then at edges and ends. Use galvanized roofing nails or galvanized staples; comply with manufacturer's recommended spacing and referenced fastening schedule. Drive fasteners flush with surface of sheathing and locate perimeter fasteners at least 3/8 inch (9.5 mm) from edges and ends.

C. Install sheathing vertically with long edges parallel to, and centered over, studs. Install solid wood blocking where end joints do not occur over framing. Allow 1/8-inch (3-mm) open space between edges and ends of adjacent units. Stagger horizontal joints if any.

D. Cover sheathing as soon as practical after installation to prevent deterioration from wetting.

3.6 PARTICLEBOARD UNDERLAYMENT INSTALLATION

A. Comply with CPA's recommendations for type of subfloor indicated. Fill and sand gouges, gaps, and chipped edges. Sand uneven joints flush.

1. Fastening Method: Nail or staple underlayment to subflooring.

3.7 HARDBOARD UNDERLAYMENT INSTALLATION

A. Comply with CPA's recommendations and hardboard manufacturer's written instructions for preparing and applying hardboard underlayment.

1. Fastening Method: Nail or staple underlayment to subflooring.

END OF SECTION 061600

SECTION 062013 - EXTERIOR FINISH CARPENTRY

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. Plywood soffits.

B. Related Requirements:

   1. Section 061000 "Rough Carpentry" for furring, blocking, and other carpentry work not exposed to view and for framing exposed to view.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials, dimensions, profiles, textures, and colors and include construction and application details.

   1. Include data for wood-preservative treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained. Include chemical-treatment manufacturer's written instructions for finishing treated material.
   2. Include data for fire-retardant treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements.
   3. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced before shipment to Project site to levels specified.
   4. Include copies of warranties from chemical-treatment manufacturers for each type of treatment.

B. Samples for Initial Selection: For each type of product involving selection of colors, profiles, or textures.

C. Samples for Verification:

   1. For each species and cut of lumber and panel products, with 1/2 of exposed surface finished; 50 sq. in. (300 sq. cm) for lumber and 8 by 10 inches (200 by 250 mm) for panels.

1.4 INFORMATIONAL SUBMITTALS

A. Compliance Certificates:

1. For lumber that is not marked with grade stamp.
2. For preservative-treated wood that is not marked with treatment-quality mark.
3. For fire-retardant-treated wood that is not marked with classification marking of testing and inspecting agency.

B. Evaluation Reports: For the following, from ICC-ES:

1. Wood-preservative-treated wood.
2. Fire-retardant-treated wood.

C. Sample Warranties: For manufacturer's warranties.

1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant-treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber, plywood, and other panels flat with spacers between each bundle to provide air circulation. Protect materials from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

1.7 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecast weather conditions permit work to be performed and at least one coat of specified finish can be applied without exposure to rain, snow, or dampness.

1. For exterior ornamental wood columns, comply with manufacturer's written instructions and warranty requirements.

B. Do not install finish carpentry materials that are wet, moisture damaged, or mold damaged.

1. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Regional Materials: The following wood products shall be manufactured within 500 miles (800 km) of Project site from materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles (800 km) of Project site.

1. Exterior trim.
2. Exterior plywood soffits.

B. Certified Wood: The following wood products shall be produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship":

1. Exterior trim.
2. Exterior plywood soffits.

C. Lumber: DOC PS 20 and the following grading rules:

1. NeLMA: Northeastern Lumber Manufacturers' Association, "Standard Grading Rules for Northeastern Lumber."
2. NLGA: National Lumber Grades Authority, "Standard Grading Rules for Canadian Lumber."
3. RIS: Redwood Inspection Service, "Standard Specifications for Grades of California Redwood Lumber."
4. SPIB: The Southern Pine Inspection Bureau, "Standard Grading Rules for Southern Pine Lumber."
5. WCLIB: West Coast Lumber Inspection Bureau, Standard No. 17, "Grading Rules for West Coast Lumber."
6. WWPA: Western Wood Products Association, "Western Lumber Grading Rules."

D. Factory mark each piece of lumber with grade stamp of inspection agency indicating grade, species, moisture content at time of surfacing, and mill.

1. For exposed lumber, mark grade stamp on end or back of each piece.

E. Softwood Plywood: DOC PS 1.

F. Hardboard: ANSI A135.4.

2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

A. Water-Repellent Preservative Treatment by Nonpressure Process: AWPA N1; dip, spray, flood, or vacuum-pressure treatment.

1. Preservative Chemicals: 3-iodo-2-propynyl butyl carbamate (IPBC), combined with an insecticide containing chloropyrifos (CPF).

2. Use chemical formulations that do not bleed through or otherwise adversely affect finishes. Do not use colorants in solution to distinguish treated material from untreated material.
3. Application: Exterior trim.

B. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC3b.

1. Kiln dry lumber and plywood after treatment to a maximum moisture content of 19 and 18 percent respectively.
2. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
3. For exposed items indicated to receive transparent finish, do not use chemical formulations that contain colorants or that bleed through or otherwise adversely affect finishes.
4. Do not use material that is warped or does not comply with requirements for untreated material.
5. Mark lumber with treatment-quality mark of an inspection agency approved by the American Lumber Standard Committee's Board of Review.

    a. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece.

6. Mark plywood with appropriate classification marking of an inspection agency acceptable to authorities having jurisdiction.

    a. For exposed plywood indicated to receive a stained or natural finish, mark back of each piece.

7. Application: All exterior lumber and plywood.

2.3 FIRE-RETARDANT-TREATED MATERIALS

A. General: For applications indicated, use materials complying with requirements in this article that are acceptable to authorities having jurisdiction, and comply with testing requirements; testing by a qualified testing agency.

B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame spread index of 25 or less when tested according to ASTM E 84, with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet (3.2 m) beyond the centerline of the burners at any time during the test.

1. Exterior Type: Materials shall comply with testing requirements after being subjected to accelerated weathering according to ASTM D 2898.
2. Kiln dry lumber and plywood after treatment to a maximum moisture content of 19 and 15 percent respectively.

C. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not contain colorants, and provide materials that do not have marks from spacer sticks on exposed face.

D. Do not use material that does not comply with requirements for untreated material or is warped or discolored.

E. Identify fire-retardant-treated wood with appropriate classification marking of testing and inspecting agency acceptable to authorities having jurisdiction.

F. Application: All exterior lumber and plywood.

2.4 EXTERIOR TRIM

A. Lumber Trim for Painted Finish:

1. Species and Grade: Redwood, Grade B; RIS.
2. Species and Grade: Western red cedar, Grade A; NLGA, WCLIB, or WWPA.
3. Species and Grade: Hem-fir, Prime or D finish; NLGA, WCLIB, or WWPA.
4. Species and Grade: Eastern white pine, eastern hemlock-balsam fir-tamarack, eastern spruce, or white woods; D Select (Quality); NeLMA, NLGA, WCLIB, or WWPA.
5. Species and Grade: Northern white cedar, D Select; NeLMA or NLGA.
6. Maximum Moisture Content: 15 percent with at least 85 percent of shipment at 12 percent or less.
7. Finger Jointing: Allowed if made with wet-use adhesive complying with ASTM D 5572.
8. Face Surface: Surfaced (smooth).
9. Factory Priming: Factory coated on faces and edges with exterior primer compatible with topcoats specified.

B. MDO Trim: Exterior Grade B-B, MDO plywood.

C. Primed Hardboard Trim: High-temperature-cured, high-resin, wood-fiber composite; factory primed on faces and edges. Recommended by manufacturer for exterior use.

2.5 PLYWOOD SOFFITS

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. Georgia-Pacific Corp.
2. Hardel Mutual Plywood Corporation.
3. Hood Industries.
4. K Ply Inc.
5. Pacific Wood Laminates, Inc.
6. Plum Creek Timber Company, Inc.
7. Roseburg Forest Products Co.
8. Roy O. Martin Lumber Management, L.L.C.
9. SDS Lumber Company; Bingen Plywood Division.
10. Stimson Lumber Company, Inc.
11. Swanson Group; Plywood Division.
12. Textured Forest Products, Inc.

B. Plywood Type: Exterior, Grade A-C.

1. Face Grade: 303-OC.
2. Face Grade: 303-18.

C. Thickness: 1/2 inch (12.7 mm).

D. Face Species: Douglas fir.

E. Pattern: Plain.

F. Surface: Smooth.

2.6 MISCELLANEOUS MATERIALS

A. Fasteners for Exterior Finish Carpentry: Provide nails or screws, in sufficient length to penetrate not less than 1-1/2 inches (38 mm) into wood substrate.

1. For face-fastening siding, provide ringed-shank siding nails or hot-dip galvanized-steel siding nails.
2. For prefinished items, provide matching prefinished aluminum fasteners where face fastening is required.
3. For pressure-preservative-treated wood, provide hot-dip galvanized-steel fasteners.
4. For applications not otherwise indicated, provide hot-dip galvanized-steel fasteners.

B. Wood Glue: Waterproof resorcinol glue recommended by manufacturer for exterior carpentry use.

C. Flashing: Comply with requirements in Section 076200 "Sheet Metal Flashing and Trim" for flashing materials installed in exterior finish carpentry.

1. Horizontal Joint Flashing for Panel Siding: Preformed, galvanized-steel, Z-shaped flashing.

D. Insect Screening for Soffit Vents: Aluminum, 18-by-16-inch (1.6-by-1.4-mm) mesh.

E. Continuous Soffit Vents: Aluminum hat channel shape with perforations, 2 inches (51 mm) wide and in lengths not less than 96 inches (2438 mm).

1. Net Free Area: 4 sq. in./linear ft. (280 sq. cm/m).
2. Finish: Mill finish.

F. Round Soffit Vents: Stamped aluminum louvered vents, 2 inches (51 mm) in diameter, made to be inserted into round holes cut into soffit.

1. Finish: Mill finish.

G. Sealants: Latex, complying with ASTM C 834 Type OP, Grade NF and with applicable requirements in Section 079200 "Joint Sealants," recommended by sealant manufacturer and manufacturer of substrates for intended application.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. BASF Building Systems; Sonolac.
b. Bostik, Inc.; Chem-Calk 600.
c. May National Associates, Inc.; Bondaflex 600
d. Pecora Corporation; AC-20+.
e. Schnee-Morehead, Inc., an ITW company; SM 8200.
f. Tremco Incorporated; Tremflex 834.

2.7 FABRICATION

A. Back out or kerf backs of standing and running trim wider than 5 inches (125 mm), except members with ends exposed in finished work.

B. Ease edges of lumber less than 1 inch (25 mm) in nominal thickness to 1/16-inch (1.5-mm) radius and edges of lumber 1 inch (25 mm) or more in nominal thickness to 1/8-inch (3-mm) radius.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Examine finish carpentry materials before installation. Reject materials that are wet, moisture damaged, and mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrates of projections and substances detrimental to application.

B. Prime lumber and moldings to be painted, including both faces and edges, unless factory primed. Cut to required lengths and prime ends. Comply with requirements in Section 099113 "Exterior Painting."

3.3 INSTALLATION, GENERAL

A. Do not use materials that are unsound, warped, improperly treated or finished, inadequately seasoned, or too small to fabricate with proper jointing arrangements.

1. Do not use manufactured units with defective surfaces, sizes, or patterns.

B. Install exterior finish carpentry level, plumb, true, and aligned with adjacent materials. Use concealed shims where necessary for alignment.

1. Scribe and cut exterior finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.
2. Install to tolerance of 1/8 inch in 96 inches (3 mm in 2438 mm) for level and plumb. Install adjoining exterior finish carpentry with 1/32-inch (0.8-mm) maximum offset for flush installation and 1/16-inch (1.5-mm) maximum offset for reveal installation.
3. Install stairs with no more than 3/16-inch (4.7-mm) variation between adjacent treads and risers and with no more than 3/8-inch (9.5-mm) variation between largest and smallest treads and risers within each flight.
4. Coordinate exterior finish carpentry with materials and systems in or adjacent to it. Provide cutouts for mechanical and electrical items that penetrate exterior finish carpentry.

3.4 STANDING AND RUNNING TRIM INSTALLATION

A. Install flat-grain lumber with bark side exposed to weather.

B. Install cellular PVC trim to comply with manufacturer's written instructions.

C. Install trim with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Do not use pieces less than 24 inches (610 mm) long except where necessary.

1. Use scarf joints for end-to-end joints.
2. Stagger end joints in adjacent and related members.

D. Fit exterior joints to exclude water. Cope at returns and miter at corners to produce tight-fitting joints with full-surface contact throughout length of joint. Plane backs of casings to provide uniform thickness across joints, where necessary for alignment.

E. Where face fastening is unavoidable, countersink fasteners, fill surface flush, and sand unless otherwise indicated.

3.5 ADJUSTING

A. Replace exterior finish carpentry that is damaged or does not comply with requirements. Exterior finish carpentry may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing. Adjust joinery for uniform appearance.

3.6 CLEANING

A. Clean exterior finish carpentry on exposed and semiexposed surfaces. Touch up factory-applied finishes to restore damaged or soiled areas.

3.7 PROTECTION

A. Protect installed products from damage from weather and other causes during construction.

B. Remove and replace finish carpentry materials that are wet, moisture damaged, and mold damaged.

1. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 062013

SECTION 071326 - SELF-ADHERING SHEET WATERPROOFING

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. Modified bituminous sheet waterproofing.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review waterproofing requirements including surface preparation, substrate condition and pretreatment, minimum curing period, forecasted weather conditions, special details and sheet flashings, installation procedures, testing and inspection procedures, and protection and repairs.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, and tested physical and performance properties of waterproofing.
2. Include manufacturer's written instructions for evaluating, preparing, and treating substrate.

B. Shop Drawings: Show locations and extent of waterproofing and details of substrate joints and cracks, sheet flashings, penetrations, inside and outside corners, tie-ins with adjoining waterproofing, and other termination conditions.

1. Include setting drawings showing layout, sizes, sections, profiles, and joint details of pedestal-supported concrete pavers.

C. Samples: For each exposed product and for each color and texture specified, including the following products:

1. 8-by-8-inch (200-by-200-mm) square of waterproofing and flashing sheet.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Field quality-control reports.

C. Sample Warranties: For special warranties.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by waterproofing manufacturer.

B. Mockups: Build mockups to verify selections made under Sample submittals and to set quality standards for installation.

1. Build for each typical waterproofing installation including accessories to demonstrate surface preparation, crack and joint treatment, corner treatment, and protection.

a. Size: 100 sq. ft. (9.3 sq. m) in area.
b. Description: Each type of wall installation.

2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 FIELD CONDITIONS

A. Environmental Limitations: Apply waterproofing within the range of ambient and substrate temperatures recommended by waterproofing manufacturer. Do not apply waterproofing to a damp or wet substrate.

1. Do not apply waterproofing in snow, rain, fog, or mist.

B. Maintain adequate ventilation during preparation and application of waterproofing materials.

1.8 WARRANTY

A. Manufacturer's Warranty: Manufacturer's standard materials-only warranty in which manufacturer agrees to furnish replacement waterproofing material for waterproofing that does not comply with requirements or that fails to remain watertight within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

B. Installer's Special Warranty: Specified form, on warranty form at end of this Section, signed by Installer, covering Work of this Section, for warranty period of two years.

1. Warranty includes removing and reinstalling protection board, drainage panels, insulation, pedestals, and pavers on plaza decks.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Source Limitations for Waterproofing System: Obtain waterproofing materials from single source from single manufacturer.

2.2 MODIFIED BITUMINOUS SHEET WATERPROOFING

A. Modified Bituminous Sheet: Minimum 60-mil (1.5-mm) nominal thickness, self-adhering sheet consisting of 56 mils (1.4 mm) of rubberized asphalt laminated on one side to a 4-mil- (0.10-mm-) thick, polyethylene-film reinforcement, and with release liner on adhesive side.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

    a. American Hydrotech, Inc; VM75.
    b. Carlisle Coatings & Waterproofing Inc; CCW MiraDRI 860/861.
    c. CETCO Building Materials Group, a subsidiary of AMCOL International Corp; Envirosheet.
    d. Grace Construction Products; W.R. Grace & Co. -- Conn; Bituthene 4000.
    e. Henry Company; Blueskin WP 100/200.
    f. Meadows, W.R.,Inc; SealTight Mel-Rol.
    g. Nervastral, Inc; BITU-MEM.
    h. Polyguard Products, Inc; Polyguard 650.
    i. Protecto Wrap Company; PW 100/60.
    j. Tamko Building Products, Inc; TW-60.
    k. York Manufacturing, Inc; HydroGard.

2. Physical Properties:

    a. Tensile Strength, Membrane: 250 psi (1.7 MPa) minimum; ASTM D 412, Die C, modified.
    b. Ultimate Elongation: 300 percent minimum; ASTM D 412, Die C, modified.
    c. Low-Temperature Flexibility: Pass at minus 20 deg F (minus 29 deg C); ASTM D 1970.
    d. Crack Cycling: Unaffected after 100 cycles of 1/8-inch (3-mm) movement; ASTM C 836.
    e. Puncture Resistance: 40 lbf (180 N) minimum; ASTM E 154.
    f. Water Absorption: 0.2 percent weight-gain maximum after 48-hour immersion at 70 deg F (21 deg C); ASTM D 570.
    g. Water Vapor Permeance: 0.05 perms (2.9 ng/Pa x s x sq. m) maximum; ASTM E 96/E 96M, Water Method.
    h. Hydrostatic-Head Resistance: [200 feet (60 m)] <Insert value> minimum; ASTM D 5385.

3. Sheet Strips: Self-adhering, rubberized-asphalt strips of same material and thickness as sheet waterproofing.

B. Modified Bituminous Sheet, Fabric Reinforced: Minimum 60-mil (1.5-mm) nominal thickness, self-adhering sheet consisting of rubberized-asphalt membrane with embedded fabric reinforcement, and with release liner on adhesive side.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Protecto Wrap Company; Jiffy Seal 140/60.
b. Royston; 104AHT Membrane

2. Physical Properties:

a. Pliability: No cracks when bent 180 degrees over a 1-inch (25-mm) mandrel at minus 25 deg F (minus 32 deg C); ASTM D 146.
b. Puncture Resistance: 40 lbf (180 N) minimum; ASTM E 154.
c. Water Vapor Permeance: 0.05 perms (2.9 ng/Pa x s x sq. m) maximum; ASTM E 96/E 96M, Water Method.

3. Sheet Strips: Self-adhering, reinforced, rubberized-asphalt strips of same material and thickness as sheet waterproofing.

2.3 AUXILIARY MATERIALS

A. General: Furnish auxiliary materials recommended by waterproofing manufacturer for intended use and compatible with sheet waterproofing.

1. Furnish liquid-type auxiliary materials that comply with VOC limits of authorities having jurisdiction.

B. Primer: Liquid waterborne primer recommended for substrate by sheet-waterproofing material manufacturer.

C. Surface Conditioner: Liquid, waterborne surface conditioner recommended for substrate by sheet-waterproofing material manufacturer.

D. Liquid Membrane: Elastomeric, two-component liquid, cold fluid applied, of trowel grade or low viscosity.

E. Substrate Patching Membrane: Low-viscosity, two-component, modified asphalt coating.

F. Metal Termination Bars: Aluminum bars, approximately 1 by 1/8 inch (25 by 3 mm) thick, predrilled at 9-inch (229-mm) centers.

G. Protection Course: ASTM D 6506, semirigid sheets of fiberglass or mineral-reinforced-asphaltic core, pressure laminated between two asphalt-saturated fibrous liners and as follows:

1. Thickness: 1/8 inch (3 mm), nominal.

2. Thickness: 1/8 inch (3 mm), nominal, for vertical applications; 1/4 inch (6 mm), nominal, elsewhere.
3. Adhesive: Rubber-based solvent type recommended by waterproofing manufacturer for protection course type.

H. Protection Course: Fan folded, with a core of extruded-polystyrene board insulation faced on one side with plastic film, nominal thickness 1/4 inch (6 mm), with compressive strength of not less than 8 psi (55 kPa) per ASTM D 1621, and maximum water absorption by volume of 0.6 percent per ASTM C 272.

I. Protection Course: Extruded-polystyrene board insulation, unfaced, ASTM C 578, Type X, 1/2 inch (13 mm) thick.

J. Protection Course: Molded-polystyrene board insulation, ASTM C 578, Type I, 0.90-lb/cu. ft. (15-kg/cu. m) minimum density, 1-inch (25-mm) minimum thickness.

2.4 INSULATION

A. Insulation, General: Comply with Section 072100 "Thermal Insulation."

B. Board Insulation: Extruded-polystyrene board insulation complying with ASTM C 578, square edged.

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. DiversiFoam Products.
b. Dow Chemical Company (The)
c. Owens Corning Insulating Systems LLC.
d. Pactiv Corporation.
e. T. Clear Corporation, a subsidiary of Fin Pan Inc.

2. Type IV, 25-psi (173-kPa) minimum compressive strength.
3. Type VI, 40-psi (276-kPa) minimum compressive strength.
4. Type VII, 60-psi (414-kPa) minimum compressive strength.
5. Type V, 100-psi (690-kPa) minimum compressive strength.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the waterproofing.

1. Verify that concrete has cured and aged for minimum time period recommended in writing by waterproofing manufacturer.

2. Verify that substrate is visibly dry and within the moisture limits recommended in writing by manufacturer. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
3. Verify that compacted subgrade is dry, smooth, sound, and ready to receive waterproofing sheet.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SURFACE PREPARATION

A. Clean, prepare, and treat substrates according to manufacturer's written instructions. Provide clean, dust-free, and dry substrates for waterproofing application.

B. Mask off adjoining surfaces not receiving waterproofing to prevent spillage and overspray affecting other construction.

C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.

D. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids.

E. Prepare, fill, prime, and treat joints and cracks in substrates. Remove dust and dirt from joints and cracks according to ASTM D 4258.

1. Install sheet strips of width according to manufacturer's written instructions and center over treated construction and contraction joints and cracks exceeding a width of 1/16 inch (1.6 mm).

F. Bridge and cover isolation joints expansion joints and discontinuous deck-to-wall and deck-to-deck joints with overlapping sheet strips of widths according to manufacturer's written instructions.

1. Invert and loosely lay first sheet strip over center of joint. Firmly adhere second sheet strip to first and overlap to substrate.

G. Corners: Prepare, prime, and treat inside and outside corners according to ASTM D 6135.

1. Install membrane strips centered over vertical inside corners. Install 3/4-inch (19-mm) fillets of liquid membrane on horizontal inside corners and as follows:

a. At footing-to-wall intersections, extend liquid membrane in each direction from corner or install membrane strip centered over corner.
b. At plaza-deck-to-wall intersections, extend liquid membrane or sheet strips onto deck waterproofing and to finished height of sheet flashing.

H. Prepare, treat, and seal vertical and horizontal surfaces at terminations and penetrations through waterproofing and at drains and protrusions according to ASTM D 6135.

3.3 MODIFIED BITUMINOUS SHEET-WATERPROOFING APPLICATION

A. Install modified bituminous sheets according to waterproofing manufacturer's written instructions and recommendations in ASTM D 6135.

B. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by sheet waterproofing in same day. Reprime areas exposed for more than 24 hours.

C. Apply and firmly adhere sheets over area to receive waterproofing. Accurately align sheets and maintain uniform 2-1/2-inch- (64-mm-) minimum lap widths and end laps. Overlap and seal seams, and stagger end laps to ensure watertight installation.

1. When ambient and substrate temperatures range between 25 and 40 deg F (minus 4 and plus 5 deg C), install self-adhering, modified bituminous sheets produced for low-temperature application. Do not use low-temperature sheets if ambient or substrate temperature is higher than 60 deg F (16 deg C).

D. Two-Ply Application: Install sheets to form a membrane with lap widths not less than 50 percent of sheet widths, to provide a minimum of two thicknesses of sheet membrane over areas to receive waterproofing.

E. Horizontal Application: Apply sheets from low to high points of decks to ensure that laps shed water.

F. Apply continuous sheets over already-installed sheet strips, bridging substrate cracks, construction, and contraction joints.

G. Seal edges of sheet-waterproofing terminations with mastic.

H. Install sheet-waterproofing and auxiliary materials to tie into adjacent waterproofing.

I. Repair tears, voids, and lapped seams in waterproofing not complying with requirements. Slit and flatten fishmouths and blisters. Patch with sheet waterproofing extending 6 inches (150 mm) beyond repaired areas in all directions.

J. Immediately install protection course with butted joints over waterproofing membrane.

1. Board insulation may be used in place of a separate protection course to vertical applications when approved by waterproofing manufacturer and installed immediately.

3.4 MODIFIED BITUMINOUS DECK-PAVING SHEET-WATERPROOFING APPLICATION

A. Install modified bituminous deck-paving sheets according to waterproofing manufacturer's written instructions.

B. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by sheet waterproofing in same day. Reprime areas exposed for more than 24 hours.

C. Apply and firmly adhere sheets over areas to receive waterproofing. Accurately align sheets and maintain uniform 2-1/2-inch- (64-mm-) minimum side-lap widths and 6-inch (150-mm) end laps. Overlap and seal seams and stagger end laps to ensure watertight installation.

D. Apply sheet waterproofing from low to high points of decks to ensure that laps shed water.

E. Apply continuous sheets over already-installed sheet strips, bridging substrate cracks, construction, and contraction joints.

F. Seal edges of sheet-waterproofing terminations with mastic.

G. Install sheet-waterproofing and auxiliary materials to tie into adjacent waterproofing.

H. Repair tears, voids, and lapped seams in waterproofing that do not comply with requirements. Slit and flatten fishmouths and blisters. Patch with sheet waterproofing extending 6 inches (150 mm) beyond repaired areas in all directions.

3.5 INSULATION INSTALLATION

A. Install one or more layers of board insulation to achieve required thickness over waterproofed surfaces. Cut and fit to within 3/4 inch (19 mm) of projections and penetrations.

B. On vertical surfaces, set insulation units in adhesive or tape applied according to manufacturer's written instructions.

C. On horizontal surfaces, loosely lay insulation units according to manufacturer's written instructions. Stagger end joints and tightly abut insulation units.

3.6 FIELD QUALITY CONTROL

A. Engage a site representative qualified by waterproofing membrane manufacturer to inspect substrate conditions, surface preparation, membrane application, flashings, protection, and drainage components, and to furnish daily reports to Architect.

B. Flood Testing: Flood test each deck area for leaks, according to recommendations in ASTM D 5957, after completing waterproofing but before overlying construction is placed. Install temporary containment assemblies, plug or dam drains, and flood with potable water.

1. Flood to an average depth of 2-1/2 inches (64 mm) with a minimum depth of 1 inch (25 mm) and not exceeding a depth of 4 inches (100 mm). Maintain 2 inches (51 mm) of clearance from top of sheet flashings.
2. Flood each area for 48 hours.
3. After flood testing, repair leaks, repeat flood tests, and make further repairs until waterproofing installation is watertight.

C. Engage an independent testing agency to observe flood testing and examine underside of decks and terminations for evidence of leaks during flood testing.

D. Prepare test and inspection reports.

3.7 PROTECTION, REPAIR, AND CLEANING

A. Do not permit foot or vehicular traffic on unprotected membrane.

B. Protect waterproofing from damage and wear during remainder of construction period.

C. Protect installed board insulation from damage due to UV light, harmful weather exposures, physical abuse, and other causes. Provide temporary coverings where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

D. Correct deficiencies in or remove waterproofing that does not comply with requirements; repair substrates, reapply waterproofing, and repair sheet flashings.

E. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 071326

SECTION 071800 - TRAFFIC COATINGS

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 traffic coatings and pavement markings for the following applications:

1. Pedestrian traffic.
2. Vehicular traffic.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product, including installation instructions.

B. Samples for Initial Selection: For each type of exposed finish.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Certificates: For each type of traffic coating.

C. Field quality-control reports.

D. Sample Warranty: For special warranty.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For traffic coatings to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

B. Mockups: Build mockups to set quality standards for materials and execution.

1. Build mockup for each traffic coating and substrate to receive traffic coatings.
2. Size: 200 sq. ft. (18.5 sq. m) of each substrate to demonstrate surface preparation, joint and crack treatment, thickness, texture, color, and standard of workmanship.
3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 FIELD CONDITIONS

A. Environmental Limitations: Apply traffic coatings within the range of ambient and substrate temperatures recommended in writing by manufacturer. Do not apply traffic coatings to damp or wet substrates, when temperatures are below 40 deg F (5 deg C), when relative humidity exceeds 85 percent, or when temperatures are less than 5 deg F (3 deg C) above dew point.

1. Do not apply traffic coatings in snow, rain, fog, or mist, or when such weather conditions are imminent during the application and curing period. Apply only when frost-free conditions occur throughout the depth of substrate.

B. Do not install traffic coating until items that penetrate membrane have been installed.

C. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40 deg F (4.4 deg C) for oil-based materials and 50 deg F (10 deg C) for water-based materials, and not exceeding 95 deg F (35 deg C).

1.9 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace traffic coating that fails in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Adhesive or cohesive failures.
b. Abrasion or tearing failures.
c. Surface crazing or spalling.
d. Intrusion of water, oils, gasoline, grease, salt, deicer chemicals, or acids into deck substrate.

2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Material Compatibility: Provide primers; base-, intermediate-, and topcoat; and accessory materials that are compatible with one another and with substrate under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

B. Source Limitations:

1. Obtain traffic coatings from single source from single manufacturer.
2. Obtain primary traffic-coating materials, including primers, from traffic-coating manufacturer. Obtain accessory materials including aggregates, sheet flashings, joint sealants, and substrate repair materials of types and from sources recommended in writing by primary material manufacturer.
3. Obtain pavement-marking paint from single source from single manufacturer.

2.2 TRAFFIC COATING

A. Traffic Coating: Manufacturer's standard, traffic-bearing, seamless, high-solids-content, cold liquid-applied, elastomeric, waterproofing membrane system with integral wearing surface for pedestrian traffic and vehicular traffic; according to ASTM C 957.

1. Manufacturers: Subject to compliance with requirements.
2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

a. Advanced Polymer Technology Corporation.
b. AVM Industries, Inc.
c. BASF Construction Chemicals, LLC - Building Systems.
d. Carlisle Coatings & Waterproofing Inc.
e. Crossfield Products Corp.
f. Euclid Chemical Company (The); an RPM company.
g. Gaco Western LLC.
h. Key Resin Company.
i. LymTal International Inc.
j. Neogard; Division of Jones-Blair.
k. Pacific Polymers International, Inc.
l. ParexLahabra, Inc.
m. Pecora Corporation.
n. POLY-CARB, Inc.
o. Sherwin-Williams Company (The).
p. Tremco Incorporated; an RPM company.
q. Urethane Polymers International, Inc.

B. Primer: Liquid waterborne or solvent-borne primer recommended for substrate and conditions by traffic-coating manufacturer.

1. Material: Epoxy or Urethane.

C. Preparatory and Base Coats: Polyurethane or epoxy.

1. Thicknesses: Minimum dry film thickness as recommended in writing by manufacturer for substrate and service conditions indicated.

D. Intermediate Coat: Polyurethane or epoxy.

1. Thicknesses: Minimum dry film thickness as recommended in writing by manufacturer for substrate and service conditions indicated, measured excluding aggregate.
2. Aggregate Content: As recommended in writing by traffic-coating manufacturer for substrate and service conditions indicated. Not less than 8 to 10 lb/100 sq. ft. (3.6 to 4.5 kg/10 sq. m).

E. Topcoat: Polyurethane or epoxy.

1. Thicknesses: Minimum dry film thickness as recommended in writing by manufacturer for substrate and service conditions indicated, measured excluding aggregate.
2. Aggregate Content: As recommended in writing by traffic-coating manufacturer for substrate and service conditions indicated. As required to achieve slip-resistant finish 8 to 10 lb/100 sq. ft. (3.6 to 4.5 kg/10 sq. m).
3. Color: As selected by Architect from manufacturer's full range.

F. Aggregate: Manufacturer's standard aggregate for each use indicated of particle sizes, shape, and minimum hardness recommended in writing by traffic-coating manufacturer.

G. Fire-Test-Response Characteristics: Provide traffic-coating materials with the fire-test-response characteristics as determined by testing identical products per test method below for deck type and slopes indicated by an independent testing and inspecting agency that is acceptable to authorities having jurisdiction.

H. Energy Performance: Provide traffic coating with an initial Solar Reflectance Index of not less than 78 when calculated according to ASTM E 1980 based on the testing of identical products by a qualified testing agency.

I. Energy Performance: Provide traffic coating that is listed on the DOE's ENERGY STAR "Roof Products Qualified Product List" for low-slope roof products.

J. Energy Performance: Provide traffic coating with an initial Solar Reflectance Index of not less than 0.70 and emissivity of not less than 0.75 when tested according to CRRC-1.

K. VOC Content: Traffic coating shall have a VOC content of 150 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

L. Low-Emitting Materials: Traffic coating shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.3 ACCESSORY MATERIALS

A. Joint Sealants: As specified in Section 079200 "Joint Sealants." ASTM C 920.

B. Sheet Flashing: Nonstaining sheet material recommended in writing by traffic-coating manufacturer.

1. Thickness: Minimum 60 mils (1.5 mm).

C. Adhesive: Contact adhesive recommended in writing by traffic-coating manufacturer.

D. Reinforcing Strip: Fiberglass mesh recommended in writing by traffic-coating manufacturer.

2.4 PAVEMENT MARKINGS

A. Pavement-Marking Paint: Comply with Section 321216 "Asphalt Paving."

B. Pavement-Marking Paint: Alkyd-resin type, lead and chromate free, ready mixed, complying with AASHTO M 248, Type N, Type F or Type S; colors complying with FS TT-P-1952.

1. Color: As indicated.

C. Pavement-Marking Paint: MPI #32 Alkyd Traffic Marking Paint.

1. Color: As indicated.

D. Pavement-Marking Paint: Latex, waterborne emulsion, lead and chromate free, ready mixed, complying with FS TT-P-1952, Type II, with drying time of less than 45 minutes.

1. Color: As indicated.

E. Pavement-Marking Paint: MPI #97 Latex Traffic Marking Paint.

1. Color: As indicated.

F. Glass Beads: AASHTO M 247, Type 1.

G. VOC Content: Pavement-marking paints shall have a VOC content of 150 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

H. Low-Emitting Materials: Pavement-marking paints shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for surface smoothness, surface moisture, and other conditions affecting performance of traffic-coating work.

B. Verify that substrates are visibly dry and free of moisture.

1. Test for moisture according to ASTM D 4263.
2. Test for moisture content by method recommended in writing by traffic-coating manufacturer.

C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of traffic-coating work.

D. Proceed with installation only after substrate construction and penetrating work have been completed and unsatisfactory conditions have been corrected.

1. Begin coating application only after minimum concrete-curing and -drying period recommended in writing by traffic-coating manufacturer has passed and after substrates are dry.
2. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. General: Before applying traffic coatings, clean and prepare substrates according to ASTM C 1127 and manufacturer's written instructions to produce clean, dust-free, dry substrate for traffic-coating application. Remove projections, fill voids, and seal joints if any, as recommended in writing by traffic-coating manufacturer.

B. Schedule preparation work so dust and other contaminants from process do not fall on wet, newly coated surfaces.

C. Mask adjoining surfaces not receiving traffic coatings to prevent overspray, spillage, leaking, and migration of coatings. Prevent traffic-coating materials from entering deck substrate penetrations and clogging weep holes and drains.

D. Concrete Substrates: Mechanically abrade surface to a uniform profile acceptable to manufacturer, according to ASTM D 4259. Do not acid etch.

1. Remove grease, oil, paints, and other penetrating contaminants from concrete.
2. Remove concrete fins, ridges, and other projections.
3. Remove laitance, glaze, efflorescence, curing compounds, concrete hardeners, form-release agents, and other incompatible materials that might affect coating adhesion.
4. Remove remaining loose material to provide a sound surface, and clean surfaces according to ASTM D 4258.

3.3 TERMINATIONS AND PENETRATIONS

A. Prepare vertical and horizontal surfaces at terminations and penetrations through traffic coatings and at expansion joints, drains, and sleeves according to ASTM C 1127 and manufacturer's written instructions.

B. Provide sealant cants at penetrations and at reinforced and nonreinforced, deck-to-wall butt joints.

C. Terminate edges of deck-to-deck expansion joints with preparatory base-coat strip.

D. Install sheet flashings at deck-to-wall expansion and dynamic joints, and bond to deck and wall substrates according to manufacturer's written recommendations.

3.4 JOINT AND CRACK TREATMENT

A. Prepare, treat, rout, and fill joints and cracks in substrates according to ASTM C 1127 and manufacturer's written recommendations. Before coating surfaces, remove dust and dirt from joints and cracks according to ASTM D 4258.

1. Comply with recommendations in ASTM C 1193 for joint-sealant installation.

B. Apply reinforcing strip in traffic-coating system where recommended in writing by traffic-coating manufacturer.

3.5 TRAFFIC-COATING APPLICATION

A. Apply traffic coating according to ASTM C 1127 and manufacturer's written instructions.

B. Apply number of coats of specified compositions for each type of traffic coating at locations as indicated on Drawings.

C. Start traffic-coating application in presence of manufacturer's technical representative.

D. Verify that wet film thickness of each coat complies with requirements every 100 sq. ft. (9 sq. m).

E. Uniformly broadcast aggregate on coats specified to receive aggregate. Embed aggregate according to manufacturer's written instructions. After coat dries, sweep away excess aggregate.

F. Apply traffic coatings to prepared wall terminations and vertical surfaces to height indicated; omit aggregate on vertical surfaces.

G. Cure traffic coatings. Prevent contamination and damage during application and curing stages.

3.6 PAVEMENT MARKINGS

A. Do not apply pavement-marking paint for striping and other markings until layout, colors, and placement have been verified with Architect and traffic coating has cured.

B. Sweep and clean surface to eliminate loose material and dust.

C. Apply pavement-marking paint with mechanical equipment to produce markings of dimensions indicated with uniform straight edges. Apply at manufacturer's recommended rates for a 15-mil- (0.4-mm-) minimum, wet film thickness.

1. Apply graphic symbols and lettering with paint-resistant, die-cut stencils, firmly secured to surface. Mask an extended area beyond edges of each stencil to prevent paint application beyond stencil. Apply paint so that it cannot run beneath stencil.
2. Broadcast glass beads uniformly into wet pavement-marking paint at a rate of 6 lb/gal. (0.72 kg/L).

3.7 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform the following field tests and inspections:

1. Materials Testing:

a. Samples of material delivered to Project site shall be taken, identified, sealed, and certified in presence of Contractor.
b. Testing agency shall perform tests for characteristics specified, using applicable referenced testing procedures.
c. Testing agency shall verify thickness of coatings during traffic-coating application for each 600 sq. ft. (56 sq. m) of installed traffic coating or part thereof.

2. If test results show traffic coating does not comply with requirements, remove and replace or repair the membrane as recommended in writing by traffic-coating manufacturer and make further repairs after retesting until traffic-coating installation passes.

B. Final Traffic-Coating Inspection: Arrange for traffic-coating manufacturer's technical personnel to inspect membrane installation on completion.

1. Notify Architect or Owner 48 hours in advance of date and time of inspection.

C. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

D. Prepare test and inspection reports.

3.8 PROTECTING AND CLEANING

A. Protect traffic coatings from damage and wear during remainder of construction period.

B. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 071800

SECTION 072100 - THERMAL INSULATION

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. Glass-fiber blanket insulation.
   2. Vapor retarders.

B. Related Sections:
   1. Section 061600 "Sheathing" for foam-plastic board sheathing over wood or steel framing.
   2. Section 071326 "Self-Adhering Sheet Waterproofing" for insulated drainage panels installed with waterproofing.
   3. Section 092400 "Cement Plastering" for installation in wood-framed assemblies of insulation specified by referencing this Section.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

1.4 INFORMATIONAL SUBMITTALS

A. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each product.

B. Research/Evaluation Reports: For foam-plastic insulation, from ICC-ES.

1.5 QUALITY ASSURANCE

A. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

B. Protect foam-plastic board insulation as follows:

1. Do not expose to sunlight except to necessary extent for period of installation and concealment.
2. Protect against ignition at all times. Do not deliver foam-plastic board materials to Project site before installation time.
3. Quickly complete installation and concealment of foam-plastic board insulation in each area of construction.

PART 2 - PRODUCTS

2.1 GLASS-FIBER BLANKET INSULATION

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. CertainTeed Corporation.
2. Guardian Building Products, Inc.
3. Johns Manville.
4. Knauf Insulation.
5. Owens Corning.

B. Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled content not less than twenty-five percent.

C. Unfaced, Glass-Fiber Blanket Insulation: ASTM C 665, Type I; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.

D. Polypropylene-Scrim-Kraft-Faced, Glass-Fiber Blanket Insulation: ASTM C 665, Type II (non-reflective faced), Class A (faced surface with a flame-spread index of 25 or less); Category 1 (membrane is a vapor barrier).

E. Kraft-Faced, Glass-Fiber Blanket Insulation: ASTM C 665, Type II (non-reflective faced), Class C (faced surface not rated for flame propagation); Category 1 (membrane is a vapor barrier).

F. Reinforced-Foil-Faced, Glass-Fiber Blanket Insulation: ASTM C 665, Type III (reflective faced), Class A (faced surface with a flame-spread index of 25 or less); Category 1 (membrane is a vapor barrier), faced with foil scrim, foil-scrim kraft, or foil-scrim polyethylene.

G. Foil-Faced, Glass-Fiber Blanket Insulation: ASTM C 665, Type III (reflective faced), Class B (faced surface with a flame-propagation resistance of 0.12 W/sq. cm); Category 1 (membrane is a vapor barrier), faced with foil scrim, foil-scrim kraft, or foil-scrim polyethylene.

H. Eave Ventilation Troughs: Preformed, rigid fiberboard or plastic sheets designed and sized to fit between roof framing members and to provide cross ventilation between insulated attic spaces and vented eaves.

I. Sustainability Requirements: Provide glass-fiber blanket insulation as follows:

1. Free of Formaldehyde: Insulation manufactured with 100 percent acrylic binders and no formaldehyde.
2. Low Emitting: Insulation tested according to ASTM D 5116 and shown to emit less than 0.05-ppm formaldehyde.

2.2 VAPOR RETARDERS

A. Polyethylene Vapor Retarders: ASTM D 4397, 10 mils (0.25 mm) thick, with maximum permeance rating of 0.13 perm (7.5 ng/Pa x s x sq. m).

B. Reinforced-Polyethylene Vapor Retarders: Two outer layers of polyethylene film laminated to an inner reinforcing layer consisting of either nylon cord or polyester scrim and weighing not less than 25 lb/1000 sq. ft. (12 kg/100 sq. m), with maximum permeance rating of 0.0507 perm (2.9 ng/Pa x s x sq. m).

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Raven Industries Inc.; DURA-SKRIM 6WW.
b. Reef Industries, Inc.; Griffolyn T-65.

C. Fire-Retardant, Reinforced-Polyethylene Vapor Retarders: Two outer layers of polyethylene film laminated to an inner reinforcing layer consisting of either nonwoven grid of nylon cord or polyester scrim and weighing not less than 22 lb/1000 sq. ft. (10 kg/100 sq. m), with maximum permeance rating of 0.1317 perm (7.56 ng/Pa x s x sq. m) and with flame-spread and smoke-developed indexes of not more than 5 and 60, respectively, per ASTM E 84.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Raven Industries Inc.; DURA-SKRIM 2FR.
b. Reef Industries, Inc.; Griffolyn T-55 FR.

D. Foil-Polyester-Film Vapor Retarders: Two layers of 0.5-mil- (0.013-mm-) thick polyester film laminated to an inner layer of 1-mil- (0.025-mm-) thick aluminum foil, with maximum water-vapor transmission rate in flat condition of 0.0 g/h x sq. m and with maximum flame-spread and smoke-developed indexes of 5, per ASTM E 84.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Alumiseal Corporation; Zero Perm Vapor Barrier.

E. Vapor-Retarder Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.

F. Vapor-Retarder Fasteners: Pancake-head, self-tapping steel drill screws; with fender washers.

G. Single-Component Nonsag Urethane Sealant: ASTM C 920, Type I, Grade NS, Class 25, Use NT related to exposure, and Use O related to vapor-barrier-related substrates.

H. Adhesive for Vapor Retarders: Product recommended by vapor-retarder manufacturer and has demonstrated capability to bond vapor retarders securely to substrates indicated.

2.3 INSULATION FASTENERS

A. Adhesively Attached, Spindle-Type Anchors: Plate welded to projecting spindle; capable of holding insulation of specified thickness securely in position indicated with self-locking washer in place.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

   a. AGM Industries, Inc.; Series T TACTOO Insul-Hangers.
   b. Gemco; Spindle Type.

2. Plate: Perforated, galvanized carbon-steel sheet, 0.030 inch (0.762 mm) thick by 2 inches (50 mm) square.
3. Spindle: Copper-coated, low-carbon steel; fully annealed; 0.105 inch (2.67 mm) in diameter; length to suit depth of insulation indicated.

B. Adhesively Attached, Angle-Shaped, Spindle-Type Anchors: Angle welded to projecting spindle; capable of holding insulation of specified thickness securely in position indicated with self-locking washer in place.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

   a. Gemco; 90-Degree Insulation Hangers.

2. Angle: Formed from 0.030-inch- (0.762-mm-) thick, perforated, galvanized carbon-steel sheet with each leg 2 inches (50 mm) square.
3. Spindle: Copper-coated, low-carbon steel; fully annealed; 0.105 inch (2.67 mm) in diameter; length to suit depth of insulation indicated.

C. Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch- (0.41-mm-) thick galvanized-steel sheet, with beveled edge for increased stiffness, sized as required to hold insulation securely in place, but not less than 1-1/2 inches (38 mm) square or in diameter.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

   a. AGM Industries, Inc.
   b. Gemco;

2. Protect ends with capped self-locking washers incorporating a spring steel insert to ensure permanent retention of cap in the following locations:

a. Ceiling plenums.
b. Where indicated.

D. Insulation Standoff: Spacer fabricated from galvanized mild-steel sheet for fitting over spindle of insulation anchor to maintain air space of 1 inch (25 mm) between face of insulation and substrate to which anchor is attached.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Gemco; Clutch Clip.

E. Anchor Adhesive: Product with demonstrated capability to bond insulation anchors securely to substrates indicated without damaging insulation, fasteners, and substrates.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. AGM Industries, Inc.; TACTOO Adhesive.
b. Gemco; Tuff Bond Hanger Adhesive.

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean substrates of substances that are harmful to insulation or that interfere with insulation attachment.

3.2 INSTALLATION, GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products and applications indicated.

B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.

C. Extend insulation to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

D. Provide sizes to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.

3.3 INSTALLATION OF CAVITY-WALL INSULATION

A. Foam-Plastic Board Insulation: Install pads of adhesive spaced approximately 24 inches (610 mm) o.c. both ways on inside face, and as recommended by manufacturer. Fit courses of

insulation between wall ties and other obstructions, with edges butted tightly in both directions. Press units firmly against inside substrates.

1. Supplement adhesive attachment of insulation by securing boards with two-piece wall ties designed for this purpose and specified in Section 042000 "Unit Masonry."

B. Cellular-Glass Board Insulation: Install with closely fitting joints using attachment method according to manufacturer's written instructions.

3.4 INSTALLATION OF INSULATION FOR FRAMED CONSTRUCTION

A. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.

B. Glass-Fiber or Mineral-Wool Blanket Insulation: Install in cavities formed by framing members according to the following requirements:

1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
3. Maintain 3-inch (76-mm) clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.
4. Install eave ventilation troughs between roof framing members in insulated attic spaces at vented eaves.
5. For metal-framed wall cavities where cavity heights exceed 96 inches (2438 mm), support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs.
6. For wood-framed construction, install blankets according to ASTM C 1320 and as follows:

    a. With faced blankets having stapling flanges, secure insulation by inset, stapling flanges to sides of framing members.
    b. With faced blankets having stapling flanges, lap blanket flange over flange of adjacent blanket to maintain continuity of vapor retarder once finish material is installed over it.

7. Vapor-Retarder-Faced Blankets: Tape joints and ruptures in vapor-retarder facings, and seal each continuous area of insulation to ensure airtight installation.

    a. Exterior Walls: Set units with facing placed toward exterior of construction.
    b. Interior Walls: Set units with facing placed toward areas of high humidity.

C. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:

1. Spray Polyurethane Insulation: Apply according to manufacturer's written instructions.

3.5 INSTALLATION OF INSULATION IN CEILINGS FOR SOUND ATTENUATION

A. Where glass-fiber blankets are indicated for sound attenuation above ceilings, install blanket insulation over entire ceiling area in thicknesses indicated. Extend insulation 48 inches (1219 mm) up either side of partitions.

3.6 INSTALLATION OF RADIANT BARRIERS

A. Install interior radiation control coating system according to ASTM C 1321.

B. Install sheet radiant barriers according to ASTM C 1158.

3.7 INSTALLATION OF INSULATION FOR CONCRETE SUBSTRATES

A. Install board insulation on concrete substrates by adhesively attached, spindle-type insulation anchors as follows:

1. Fasten insulation anchors to concrete substrates with insulation anchor adhesive according to anchor manufacturer's written instructions. Space anchors according to insulation manufacturer's written instructions for insulation type, thickness, and application indicated.
2. Apply insulation standoffs to each spindle to create cavity width indicated between concrete substrate and insulation.
3. After adhesive has dried, install board insulation by pressing insulation into position over spindles and securing it tightly in place with insulation-retaining washers, taking care not to compress insulation below indicated thickness.
4. Where insulation will not be covered by other building materials, apply capped washers to tips of spindles.

3.8 INSTALLATION OF VAPOR RETARDERS

A. Place vapor retarders on side of construction indicated on Drawings. Extend vapor retarders to extremities of areas to protect from vapor transmission. Secure vapor retarders in place with adhesives or other anchorage system as indicated. Extend vapor retarders to cover miscellaneous voids in insulated substrates, including those filled with loose-fiber insulation.

B. Seal vertical joints in vapor retarders over framing by lapping no fewer than two studs.

1. Fasten vapor retarders to wood framing at top, end, and bottom edges; at perimeter of wall openings; and at lap joints. Space fasteners 16 inches (406 mm) o.c.
2. Before installing vapor retarders, apply urethane sealant to flanges of metal framing including runner tracks, metal studs, and framing around door and window openings. Seal overlapping joints in vapor retarders with vapor-retarder tape according to vapor-retarder manufacturer's written instructions. Seal butt joints with vapor-retarder tape. Locate all joints over framing members or other solid substrates.
3. Firmly attach vapor retarders to metal framing and solid substrates with vapor-retarder fasteners as recommended by vapor-retarder manufacturer.

C. Seal joints caused by pipes, conduits, electrical boxes, and similar items penetrating vapor retarders with vapor-retarder tape to create an airtight seal between penetrating objects and vapor retarders.

D. Repair tears or punctures in vapor retarders immediately before concealment by other work. Cover with vapor-retarder tape or another layer of vapor retarders.

3.9 PROTECTION

A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

3.10 INSULATION SCHEDULE

A. Insulation Type: Unfaced, glass-fiber blanket insulation.

B. Insulation Type: Faced, glass-fiber blanket insulation.

C. Insulation Type: Unfaced, mineral-wool blanket insulation.

D. Insulation Type: Faced, mineral-wool blanket insulation.

END OF SECTION 072100

SECTION 072500

WEATHER BARRIERS

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 self-adhering sheet air and water barriers.

B. Related Sections:
1. Section 061600 "Sheathing" for wall sheathings and wall sheathing joint-and-penetration treatments.
2. Section 076200 “Sheet Metal Flashing and Trim.”
3. Section 079200 “Joint Sealants”.

1.3 DEFINITIONS

A. Air-Barrier Material: A primary element that provides a continuous barrier to the movement of air.

B. Air-Barrier Accessory: A transitional component of the air barrier that provides continuity.

C. Air-Barrier Assembly: The collection of air-barrier materials and accessory materials applied to an opaque wall, including joints and junctions to abutting construction, to control air movement through the wall.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include manufacturer's written instructions for evaluating, preparing, and treating substrate; technical data; and tested physical and performance properties of products.

B. CALGreen Submittals:

1. Product Data for Requirement 5.504.4.1: For adhesives, sealants, and caulks, documentation indicating products meet local or regional air pollution control or air quality management district rules or SCAQMD Rule 1168 VOC limits, as shown in Tables 5.504.4.1 and 5.504.4.2 of the California Building Code. Products may be used on the interior or exterior of the building.
2. Product Data for Requirement 5.504.4.3: For paints and coatings, documentation indicating products meet Table 5.504.4.3 in the California Building Code, unless more stringent local limits apply. Products may be used on the interior or exterior of the building.

C. Material Safety Data Sheets (MSDS): For storage at project site.

D. Shop Drawings: For air-barrier assemblies.

1. Show locations and extent of air barrier. Include details for substrate joints and cracks, counterflashing strips, penetrations, inside and outside corners, terminations, and tie-ins with adjoining construction.
2. Include details of interfaces with other materials that form part of air barrier.
3. Details shall be project specific beyond those typically published by the product manufacturer showing intended substrates and integrations with adjacent systems.
4. Submit shop drawings to manufacturer for review and approval prior to submitting to Architect.
5. Provide plans and elevations to indicate extent of materials and location of details.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Certificates: From air-barrier manufacturer, certifying compatibility of air barriers and accessory materials with Project materials that connect to or that come in contact with air barrier.

C. Product Test Reports: For each air-barrier assembly, for tests performed by a qualified testing agency.

D. Warranties: Special warranties specified in this Section.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An entity specializing in the installation of air barrier systems with a minimum 5 years documented experience that employs installers and supervisors who are trained and approved by manufacturer.

1. Installer shall be licensed by ABAA according to ABAA's Quality Assurance Program and shall employ ABAA-certified installers and supervisors on Project.

B. Manufacturer Qualifications: Company specializing in production of waterproofing and air barrier systems with minimum 10 years documented continuous experience in the manufacture of permeable water-resistive air barrier products and employing experienced in-house technical and field observation personnel qualified to provide expert technical support.

C. Preinstallation Conference: Conduct conference at Project site after approval of complete submittal. Review requirements for air barrier, including surface preparation specified under other Sections, substrate condition and pretreatment, temporary weather protection, forecasted weather conditions, special details and sheet flashings, installation procedures, testing and inspection procedures, and protection and repairs.

D. Mockups: Build field mockups to set quality standards for materials and execution.

1. Build integrated mockups of exterior wall assembly, incorporating backup wall construction, external cladding, window, storefront, door frame and sill, insulation, ties and other penetrations, and flashing to demonstrate surface preparation, crack and joint treatment, application of air barriers, and sealing of gaps, terminations, and penetrations of air-barrier assembly.

    a. Coordinate construction of mockups to permit inspection by Owner's testing agency of air barrier before external insulation and cladding are installed.
    b. Include junction with roofing membrane, building corner condition, expansion joint, and foundation wall intersection.

2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in original containers with seals unbroken, wrapped in a polythene sleeve, labeled with manufacturer's name, and product brand name.

B. Remove and replace liquid materials that cannot be applied within their stated shelf life.

C. Protect stored materials from direct sunlight.

1.8 FIELD CONDITIONS

A. Environmental Limitations: Apply air barrier within the range of ambient and substrate temperatures recommended by air-barrier manufacturer.

1. Protect substrates from environmental conditions that affect air-barrier performance.
2. Do not apply air barrier to a damp or wet substrate or during rain, fog, or mist.

1.9 WARRANTY

A. Manufacturer's Warranty: Provide manufacturer's written material warranty agreeing to replace air barrier membrane materials installed in conformance with manufacturer's written installation instructions that fail within 10 years from date of Substantial Completion.

B. Installer's Warranty: Provide installer's written 2-year warranty upon completion of work. Include removing and reinstalling collateral materials associated with replacement of waterproofing that fails within specified warranty period. Coordinate warranty period with other specification sections.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Source Limitations: Obtain primary air-barrier materials and air-barrier accessories from single source from single manufacturer.

2.2 CALGREEN REQUIREMENTS

A. 5.504.4.1 Adhesives, Primers, Sealants and Caulks: shall comply with local or regional air pollution control or air quality management district rules or SCAQMD Rule 1168 VOC limits, as shown in Tables 5.504.4.1 and 5.504.4.2 in the California Building Code. Aerosol adhesives and smaller unit sizes of adhesives and sealant and caulking compounds shall comply with statewide VOC standards, including prohibitions on use of certain toxic compounds, of CA Code of Regulations, Title 17, commencing with Section 94507. Products may be used on the interior or exterior of the building.

B. 5.504.4.3 Paints and Coatings: shall comply with Table 5.504.4.3 of the California Building Code, unless more stringent local limits apply. Aerosol paints and coatings shall meet the Product-Weighted MIR Limits for ROC in Section 94522(a)(3) and other requirements, including prohibitions on use of toxic compounds and ozone depleting substances (CCR, Title 17, Section 94520, et seq.) Products may be used on the interior or exterior of the building.

2.3 PERFORMANCE REQUIREMENTS

A. General: Air barrier shall be capable of performing as a continuous weather barrier and as a liquid-water drainage plane flashed to discharge to the exterior incidental condensation or water penetration. Air-barrier assemblies shall be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, penetrations, tie-ins to installed waterproofing,

and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.

2.4 SELF-ADHERING SHEET AIR AND WATER BARRIER, VAPOR PERMEABLE

A. Modified Bituminous Sheet: Self-adhering sheet consisting of a breathable carrier film with a specially designed adhesive, which permits the transfusion of water vapor and provides protection against air and water ingress into building structures.

1. Basis of Design Product: Subject to compliance with specified requirements, provide the following, or approved equal:

a. GCP; Perm-A-Barrier VPS.

2. Physical and Performance Properties:

a. Air Permeance: Maximum 0.004 cfm/sq. ft. of surface area at 1.57-lbf/sq. ft. pressure difference; ASTM E 2178.
b. Breaking Force: Minimum 40 lbf MD and 35 lbf CD.
c. Pull Adhesion: Minimum 15 psi to primed glass faced gypsum sheathing; ASTM D 4541.
d. Water Resistance: ICC AC 38: Pass.
e. Vapor Permeance: Not less than 10 perms; ASTM E 96/E 96M, Water Method.

2.5 ACCESSORY MATERIALS

A. General: Accessory materials recommended by air-barrier manufacturer to produce a complete air-barrier assembly and compatible with primary air-barrier membrane.

B. Primer: Liquid waterborne primer recommended for substrate by air-barrier material manufacturer.

C. Modified Bituminous Strip: Vapor retarding, 40 mils thick, smooth surfaced, self-adhering; consisting of 36 mils of rubberized asphalt laminated to a 4-mil- thick, cross-laminated polyethylene film with release liner backing; Grace Perm-a-Barrier Detail Membrane.

D. Self-Adhered Detail Membrane for use at cement plaster; Vycor Plus Self-Adhered Flashing, or approved equal.

E. Foil-Faced Self-Adhered Detail Membrane: 35 mils of self-adhesive rubberized asphalt integrally bonded to 5 mils of aluminum film to provide a minimum 40 mils thick membrane, Grace Perm-a-Barrier Aluminum Flashing, or approved equal.

F. Termination Mastic: Air-barrier manufacturer's standard cold fluid-applied elastomeric liquid; trowel grade. Grace Bituthene Liquid Membrane, or approved equal.

G. Substrate-Patching Membrane: Manufacturer's standard trowel-grade substrate filler.

H. Adhesive and Tape: Air-barrier manufacturer's standard adhesive and pressure-sensitive adhesive tape.

I. Modified Bituminous Transition Strip: Vapor retarding, 40 mils thick, smooth surfaced, self-adhering; consisting of 36 mils of rubberized asphalt laminated to a 4-mil- thick polyethylene film with release liner backing.

J. Joint Sealant: ASTM C 920, single-component, neutral-curing silicone; Class 100/50 (low modulus), Grade NS, Use NT related to exposure, and, as applicable to joint substrates indicated, Use O. Comply with Section 07 92 00 "Joint Sealants."

K. Factory Formed Corners: Grace Vycorners, or approved equal.

L. Small Penetration Flashing: Quick-Flash Inc., or approved equal.

M. Air Barrier Sealant: Dowsil 758, or approved equal.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.

1. Verify that substrates are sound and free of oil, grease, dirt, excess mortar, or other contaminants.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SURFACE PREPARATION

A. Clean, prepare, and treat substrate according to manufacturer's written instructions. Provide clean, dust-free, and dry substrate for air-barrier application.

B. Mask off adjoining surfaces not covered by air barrier to prevent spillage and overspray affecting other construction.

C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.

D. Prepare, fill, prime, and treat joints and cracks in substrates. Remove dust and dirt from joints and cracks according to ASTM D 4258.

1. Install modified bituminous strips and center over treated construction and contraction joints and cracks exceeding a width of 1/16 inch.

E. At changes in substrate plane, apply sealant or termination mastic beads at sharp corners and edges to form a smooth transition from one plane to another.

F. Cover gaps in substrate plane and form a smooth transition from one substrate plane to another with stainless-steel sheet mechanically fastened to structural framing to provide continuous support for air barrier.

3.3 INSTALLATION

A. General: Install modified bituminous sheets and accessory materials according to air-barrier manufacturer's written instructions and according to recommendations in ASTM D 6135.

1. When ambient and substrate temperatures range between 25 and 40 deg F, install self-adhering, modified bituminous air-barrier sheet produced for low-temperature application. Do not install low-temperature sheet if ambient or substrate temperature is higher than 60 deg F.

B. Corners: Prepare, prime, and treat inside and outside corners according to ASTM D 6135.

1. Install modified bituminous strips centered over vertical inside corners. Install 3/4-inch fillets of termination mastic on horizontal inside corners.

C. Prepare, treat, and seal vertical and horizontal surfaces at terminations and penetrations with termination mastic and according to ASTM D 6135.

D. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by air-barrier sheet on same day. Reprime areas exposed for more than 24 hours.

1. Prime glass-fiber-surfaced gypsum sheathing with number of prime coats needed to achieve required bond, with adequate drying time between coats.

E. Apply and firmly adhere modified bituminous sheets horizontally over area to receive air barrier. Accurately align sheets and maintain uniform 2-1/2-inch- minimum lap widths and end laps. Overlap and seal seams, and stagger end laps to ensure airtight installation.

1. Apply sheets in a shingled manner to shed water without interception by any exposed sheet edges.

2. Roll sheets firmly with a manufacturer approved hand roller to enhance adhesion to substrate.

F. Apply continuous modified bituminous sheets over modified bituminous strips bridging substrate cracks, construction, and contraction joints.

G. Apply additional 6-inch wide strips of foil-faced detail membrane over weather barrier sheet membrane at locations where exterior sheathing is fastened to metal stud framing and at cladding fastener locations. Install 6-inch wide strips in the same on-center spacing as the metal studs.

H. Seal top of through-wall flashings to air-barrier sheet with an additional 6-inch- wide, modified bituminous strip.

I. Seal exposed edges of sheet at seams, cuts, penetrations, and terminations not concealed by metal counterflashings or ending in reglets with compatible sealant.

J. Install air-barrier sheet and accessory materials to form a seal with adjacent construction and to maintain a continuous air barrier.

1. Coordinate air-barrier installation with installation of roofing membrane and base flashing to ensure continuity of air barrier with roofing membrane.
2. Install modified bituminous strip on roofing membrane or base flashing so that a minimum of 3 inches of coverage is achieved over each substrate.

K. Connect and seal exterior wall air-barrier membrane continuously to roofing-membrane air barrier, concrete below-grade structures, floor-to-floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door framing, and other construction used in exterior wall openings, using accessory materials.

L. Wall Openings: Prime concealed, perimeter frame surfaces of windows, curtain walls, storefronts, and doors. Apply modified bituminous transition strip so that a minimum of 3 inches of coverage is achieved over each substrate. Maintain 3 inches of full contact over firm bearing to perimeter frames with not less than 1 inch of full contact.

1. Modified Bituminous Transition Strip: Roll firmly with a manufacturer approved hand roller to enhance adhesion.

M. At end of each working day, seal top edge of air-barrier material to substrate with termination mastic.

N. Apply joint sealants forming part of air-barrier assembly within manufacturer's recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

O. Repair punctures, voids, and deficient lapped seams in air barrier. Slit and flatten fishmouths and blisters. Patch with air-barrier sheet extending 6 inches beyond repaired areas in all directions.

P. Do not cover air barrier until it has been tested and inspected by Owner's testing agency.

Q. Correct deficiencies in or remove air barrier that does not comply with requirements; repair substrates and reapply air-barrier components.

3.4 CLEANING AND PROTECTION

A. Protect air-barrier system from damage during application and remainder of construction period, according to manufacturer's written instructions.

1. Protect air barrier from exposure to UV light and harmful weather exposure as required by manufacturer. If exposed to these conditions for more than 30 days, remove and replace air barrier or install additional, full-thickness, air-barrier application after repairing and preparing the overexposed membrane according to air-barrier manufacturer's written instructions.
2. Protect air barrier from contact with incompatible materials and sealants not approved by air-barrier manufacturer.

B. Clean spills, stains, and soiling from construction that would be exposed in the completed Work, using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION

SECTION 072700

UNDERSLAB VAPOR BARRIER

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: Underslab vapor barrier, Seam type, and mastic for installation under concrete slabs, and block waterstops; as shown and specified.

B. Related Sections:
1. Section 03 30 00 “Cast-in-Place Concrete.”

1.3 REFERENCES

A. General: Comply with the applicable provisions of the referenced standards except as modified by governing codes and the Contract Documents. Where a recommendation occurs in the referenced standards, it shall be considered mandatory. In the event of conflict, the more stringent standard or requirement shall govern.

1. American Society for Testing and Materials (ASTM).

a. ASTM E96 “Test Methods for Water Vapor Transmission of Materials”.
b. ASTM E1643 “Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs”.
c. ASTM E1745- 11Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.
d. ASTM E 154-99 (2005) “Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover”.
e. ASTM F 1249-06 “Standard Test Method for Water Vapor Transmission Rate Through Plastic Film and Sheeting Using a Modulated Infrared Sensor”.

2. Technical Reference – American Concrete Institute (ACI):

a. ACI 302.2R “Guide for Concrete Slabs that Receive Moisture-Sensitive flooring Materials”.
b. ACI 302.1R “Guide to Concrete floor and Slab Construction”.

1.4 SUBMITTALS

A. Product Data: Submit copies of specifications, standard installation details, installation instructions, and general recommendations by manufacturer of vapor barrier materials.

B. Shop Drawings: Show details for special conditions not covered by manufacturer's standard published details.

C. Certification:

1. Prior to Commencement of Installation: Submit the following:
   a. Certification from manufacturer of vapor barrier materials that applicator complies with qualification requirements specified.
2. Prior to Delivery of Materials: Certification that materials and components proposed for use conform to requirements shown and specified.
3. Prior to Acceptance of the Work: Certification stating that materials and workmanship have been provided in conformance with Contract Documents and material manufacturer's requirements.

D. Quality Control:

1. Summary of test results per Paragraph 9.3 of ASTM E1745.
2. Manufacturer’s samples and literature.
3. Manufacturer’s installation instructions for placement, seaming, penetration prevention and repair, and perimeter seal per ASTM E1643.
4. All mandatory ASTM E1745 testing must be performed on a single production roll per ASTM E1745 Section 8.1.

1.4 QUALITY ASSURANCE

A. Installer's Qualifications:

1. Minimum 5 years' experience with specified materials on projects of similar scope and complexity.
3. Approved by manufacturer of vapor barrier materials.

1.5 QUALITY ASSURANCE

A. Installer's Qualifications:

1. Minimum 5 years' experience with specified materials on projects of similar scope and complexity.
2. Approved by manufacturer of vapor barrier materials.

1.6 PROJECT CONDITIONS

A. Jobsite Meeting: Prior to starting Work, arrange a jobsite meeting with Architect and participants in the coordination meeting to discuss Contract Documents, review step-by-step application procedure, shop drawings, job and surface readiness, and material storage and protection.

B. Notification: Notify Architect 2 calendar days prior to jobsite meeting, starting Work, and if Work is done intermittently, before restarting Work.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Vapor Barrier: Provide where indicated or at slabs on grade to receive applied floor finishes. ASTM E1745, Class A.

1. Physical and Performance Properties:

a. Water Vapor Permeance: Maximum 0.0086 perms per ASTM F1249.
b. Thickness: 15 mils.
c. Tensile Strength: 70 lbf/in per ASTM D 882.
d. Puncture Resistance: 2266 grams per ASTM D 1709.
e. Maintain permenace of less than 0.01 Perms as tested in accordance with mandatory conditioning tests per ASTM E1745 Section 7.1 (7.1.1-7.1.5).
f. Provide third party documentation that all testing was performed on a single production roll per ASTM E1745 Section 8.1.

B. Basis of Design Product: Subject to compliance with specified criteria, provide the following:

1. Stego Industries, LLC “Stego Wrap 15-mil Vapor Barrier, Class A”.

C. Waterproof Seaming Tape: Manufacturer recommended, pressure-sensitive adhesive tape. Provide Stego Industries “Stego Tape”, “Stego Tack Tape” or “Stego Crete Claw Tape” as recommended by vapor barrier manufacturer for the substrate to receive the vapor barrier.

D. Liquid Membrane Flashing: Bituminous-asphalt emulsion, polymer-modified, water-based mastic for sealing pipe penetrations in vapor barrier; provide Stego Industries “Stego Mastic”.

PART 3 – EXECUTION

3.1 PREPARATION

A. Examine the areas to receive the Work and remedy detrimental conditions.

B. Remove projections capable of puncturing vapor barriers.

C. Manufacturer's Instructions: Prepare substrates, apply primers and install the work, including components and accessories, in accordance with the manufacturer's instructions, except where more stringent requirements are shown or specified.

D. Ensure that subsoil is approved by Architect or Geotechnical engineer.

3.2 INSTALLATION

A. Install vapor barrier in accordance with ASTM E 1643.

B. 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.

C. Extend vapor barrier to the perimeter of the slab. If practicable, terminate it at the top of the slab, otherwise (a) at a point acceptable to the structural engineer or (b) where obstructed by impediments, such as dowels, waterstops, or any other site condition requiring early termination of the vapor barrier. At the point of termination, seal vapor barrier to the foundation wall, grade beam or slab itself.

1. When sealing to the slab, seal vapor barrier to the entire slab perimeter using Stego Crete Claw, per manufacturer's instructions.
2. When sealing to a stem wall or wall, seal vapor barrier to the entire perimeter wall or footing/grade beam with double sided StegoTack Tape, or both Stego Term Bar and StegoTack Tape, per manufacturer’s instructions. Ensure the concrete is clean and dry prior to adhering tape.

D. Overlap joints 6 inches and seal with manufacturer’s seam tape.

E. Apply seam tape/Crete Claw to a clean and dry vapor barrier.

G. For interior forming applications, avoid the use of non-permanent stakes driven through vapor barrier. Use Beast Form Stake and Beast Foot as a vapor barrier-safe forming system. Ensure Beast Foot’s peel-and-stick adhesive base is fully adhered to the vapor barrier.

H. If non-permanent stakes must be driven through vapor retarder, repair as recommended by vapor retarder manufacturer.

I. Use reinforcing bar supports with base sections that eliminate or minimize the potential for puncture of the vapor barrier.

J. Repair damaged areas with vapor barrier material of similar (or better) permeance, puncture and tensile.

K. For vapor barrier-safe concrete screeding applications, install Beast Screed (vapor barrier-safe screed system) per manufacturer’s instructions prior to placing concrete.

3.3 WATERSTOP INSTALLATION

A. Install vapor barrier in accordance with ASTM E 1643.

B. Install a minimum of one block waterstop at all concrete cold joints adjacent to interior below-grade space per Manufacturer requirements. Provide additional waterstops where noted in the Project Details.

3.4 PROTECTION

A. Protect vapor barrier system from damage during application and remainder of construction period, according to manufacturer's written instructions.

END OF SECTION

SECTION 073113 - ASPHALT SHINGLES

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. Asphalt shingles.
2. Underlayment.

B. Related Sections:

1. Section 061000 "Rough Carpentry" for wood framing.
2. Section 061600 "Sheathing" for roof sheathing.
3. Section 076200 "Sheet Metal Flashing and Trim" for metal roof penetration flashings, counterflashings and flashings.

1.3 DEFINITION

A. Roofing Terminology: See ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definitions of terms related to roofing work in this Section.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples for Initial Selection: For each type of asphalt shingle indicated.

1. Include similar Samples of trim and accessories involving color selection.

C. Samples for Verification: For the following products, of sizes indicated, to verify color selected:

1. Asphalt Shingle: Full size.
2. Self-Adhering Underlayment: 12 inches (300 mm) square.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.

B. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for asphalt shingles.

C. Research/Evaluation Reports: For each type of asphalt shingle required, from the ICC.

D. Warranties: Sample of special warranties.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each type of asphalt shingle to include in maintenance manuals.

1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Asphalt Shingles: 100 sq. ft (9.3 sq. m) of each type, in unbroken bundles.

1.8 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

B. Fire-Resistance Characteristics: Where indicated, provide asphalt shingles and related roofing materials identical to those of assemblies tested for fire resistance per test method below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.

1. Exterior Fire-Test Exposure: Class A; ASTM E 108 or UL 790, for application and roof slopes indicated.

C. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Build mockups for asphalt shingles including related roofing materials.

a. Size: 48 inches (1200 mm) long by 48 inches (1200 mm) wide.

2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

D. Preinstallation Conference: Conduct conference at Project site.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Store roofing materials in a dry, well-ventilated, weathertight location according to asphalt shingle manufacturer's written instructions. Store underlayment rolls on end on pallets or other raised surfaces. Do not double stack rolls.

1. Handle, store, and place roofing materials in a manner to avoid significant or permanent damage to roof deck or structural supporting members.

B. Protect unused underlayment from weather, sunlight, and moisture when left overnight or when roofing work is not in progress.

1.10 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install asphalt shingles until spaces are enclosed and weathertight, 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. Install self-adhering sheet underlayment within the range of ambient and substrate temperatures recommended by manufacturer.

1.11 WARRANTY

A. Special Warranty: Standard form in which manufacturer agrees to repair or replace asphalt shingles that fail in materials within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Manufacturing defects.
b. Structural failures including failure of asphalt shingles to self-seal after a reasonable time.

2. Material Warranty Period: 30 years from date of Substantial Completion, prorated, with first five years nonprorated.
3. Wind-Speed Warranty Period: Asphalt shingles will resist blow-off or damage caused by wind speeds up to 80 mph (36 m/s) for five years from date of Substantial Completion.
4. Algae-Discoloration Warranty Period: Asphalt shingles will not discolor five years from date of Substantial Completion.
5. Workmanship Warranty Period: 10 years from date of Substantial Completion.

B. Special Project Warranty: Roofing Installer's Warranty, or warranty form at end of this Section, signed by roofing Installer, covering the Work of this Section, in which roofing Installer agrees to repair or replace components of asphalt shingle roofing that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GLASS-FIBER-REINFORCED ASPHALT SHINGLES

A. Laminated-Strip Asphalt Shingles: ASTM D 3462, laminated, multi-ply overlay construction, glass-fiber reinforced, mineral-granule surfaced, and self-sealing.

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:
2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

a. Atlas Roofing Corporation.
b. CertainTeed Corporation.
c. Elk Premium Building Products, Inc.; an ElkCorp company.
d. Emco Building Products Corp.
e. GAF Materials Corporation.
f. IKO.
g. Malarkey Roofing Products.
h. Owens Corning.
i. PABCO Roofing Products.
j. TAMKO Roofing Products, Inc.

3. Butt Edge: Straightcut.
4. Strip Size: Manufacturer's standard.
5. Algae Resistance: Granules treated to resist algae discoloration.
6. Color and Blends: As selected by Architect from manufacturer's full range.

B. Laminated-Strip, SBS-Modified Asphalt Shingles: ASTM D 3462, laminated, multi-ply overlay construction, glass-fiber reinforced, mineral-granule surfaced, and self-sealing; complying with UL 2218, Class IV.

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:
2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

a. Atlas Roofing Corporation.
b. Malarkey Roofing Products.

3. Butt Edge: Straight cut.
4. Strip Size: Manufacturer's standard.
5. Algae Resistance: Granules treated to resist algae discoloration.
6. Color and Blends: As selected by Architect from manufacturer's full range.

C. Multitab-Strip Asphalt Shingles: ASTM D 3462, glass-fiber reinforced, mineral-granule surfaced, and self-sealing.

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:
2. Basis-of-Design Product: Subject to compliance with requirements, provide [product indicated on Drawings] <Insert manufacturer's name; product name or designation> or comparable product by one of the following:

    a. Atlas Roofing Corporation.
    b. CertainTeed Corporation.
    c. GAF Materials Corporation.
    d. IKO.
    e. Malarkey Roofing Products.
    f. Owens Corning.
    g. PABCO Roofing Products.
    h. TAMKO Roofing Products, Inc.

3. Tab Arrangement: Four tabs, regularly spaced.
4. Cutout Shape: Square.
5. Butt Edge: Straight cut.
6. Strip Size: Manufacturer's standard.
7. Algae Resistance: Granules treated to resist algae discoloration.
8. Color and Blends: As selected by Architect from manufacturer's full range.

D. No-Cutout-Strip Asphalt Shingles: ASTM D 3462, glass-fiber reinforced, mineral-granule surfaced, self-sealing, square, and single tab.

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:
2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

    a. Atlas Roofing Corporation.
    b. CertainTeed Corporation.
    c. IKO.

3. Butt Edge: Straight cut.
4. Strip Size: Manufacturer's standard.
5. Algae Resistance: Granules treated to resist algae discoloration.
6. Color and Blends: As selected by Architect from manufacturer's full range.

E. Hip and Ridge Shingles: [Manufacturer's standard units to match asphalt shingles] [Site-fabricated units cut from asphalt shingle strips. Trim each side of lapped portion of unit to taper approximately 1 inch (25 mm)].

2.2 ORGANIC-FELT-REINFORCED ASPHALT SHINGLES

A. Laminated-Strip Asphalt Shingles: ASTM D 225, laminated, multi-ply overlay construction, organic-felt reinforced, mineral-granule surfaced, and self-sealing; complying with requirements in ASTM D 3161 for wind resistance.

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:
2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

    a. Emco Building Products Corp.
    b. IKO.

3. Butt Edge: Straight cut.
4. Strip Size: Manufacturer's standard.
5. Algae Resistance: Granules treated to resist algae discoloration.
6. Color and Blends: As selected by Architect from manufacturer's full range.

B. Multitab-Strip Asphalt Shingles: ASTM D 225, organic-felt reinforced, mineral-granule surfaced, and self-sealing; complying with requirements in ASTM D 3161 for wind resistance.

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:
2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

    a. Atlas Roofing Corporation.
    b. Emco Building Products Corp.
    c. IKO.
    d. TAMKO Roofing Products, Inc.

3. Tab Arrangement: [Three tabs, regularly spaced.
4. Strip Size: Manufacturer's standard.
5. Algae Resistance: Granules treated to resist algae discoloration.
6. Color and Blends: As selected by Architect from manufacturer's full range.

2.3 UNDERLAYMENT MATERIALS

A. Felt: ASTM D 226 or ASTM D 4869, Type I, asphalt-saturated organic felts, nonperforated.

B. Self-Adhering Sheet Underlayment, Granular Surfaced: ASTM D 1970, minimum of 55-mil-(1.4-mm-) thick sheet; glass-fiber-mat-reinforced, SBS-modified asphalt; mineral-granule surfaced; with release paper backing; cold applied.

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:
2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

    a. ALCO-NVC Inc.
    b. Atlas Roofing Corporation.
    c. Carlisle Coatings & Waterproofing, Inc.

d. CertainTeed Corporation.
e. GAF Materials Corporation.
f. Henry Company.
g. IKO.
h. Johns Manville.
i. Owens Corning.

C. Self-Adhering Sheet Underlayment, Polyethylene Faced: ASTM D 1970, minimum of 40-mil- (1.0-mm-) thick, slip-resisting, polyethylene-film-reinforced top surface laminated to SBS-modified asphalt adhesive, with release paper backing; cold applied.

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:
2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

a. Carlisle Coatings & Waterproofing, Inc.
b. Grace, W. R. & Co. - Conn.
c. Henry Company.
d. Johns Manville.
e. Owens Corning.
f. Polyguard Products, Inc.
g. Protecto Wrap Company.

D. Self-Adhering Sheet Underlayment, High Temperature: Minimum of 30- to 40-mil- (0.76- to 1.0-mm-) thick, slip-resisting, polyethylene-film-reinforced top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release paper backing; cold applied.

1. Thermal Stability: Stable after testing at 240 deg F (116 deg C); ASTM D 1970.
2. Low-Temperature Flexibility: Passes after testing at minus 20 deg F (29 deg C); ASTM D 1970.
3. 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:
4. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

a. Carlisle Coatings & Waterproofing, Inc.
b. Grace, W. R. & Co. - Conn.
c. Henry Company.

2.4 ACCESSORIES

A. Asphalt Roofing Cement: ASTM D 4586, Type II, asbestos free.

B. Roofing Nails: ASTM F 1667; aluminum, stainless-steel, copper, or hot-dip galvanized-steel wire shingle nails, minimum 0.120-inch- (3-mm-) diameter, smooth shank, sharp-pointed, with a minimum 3/8-inch- (9.5-mm-) diameter flat head and of sufficient length to penetrate 3/4 inch

(19 mm) into solid wood decking or extend at least 1/8 inch (3 mm) through OSB or plywood sheathing.

1. Where nails are in contact with metal flashing, use nails made from same metal as flashing.

C. Felt Underlayment Nails: Aluminum, stainless-steel, or hot-dip galvanized-steel wire with low-profile capped heads or disc caps, 1-inch (25-mm) minimum diameter.

2.5 METAL FLASHING AND TRIM

A. General: Comply with requirements in Section 076200 "Sheet Metal Flashing and Trim."

1. Sheet Metal: Anodized aluminum or Aluminum, mill finished.

B. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of the item.

1. Apron Flashings: Fabricate with lower flange a minimum of 4 inches (100 mm) over and 4 inches (100 mm) beyond each side of downslope asphalt shingles and 6 inches (150 mm) up the vertical surface.
2. Step Flashings: Fabricate with a headlap of 2 inches (50 mm) and a minimum extension of 4 inches (100 mm) over the underlying asphalt shingle and up the vertical surface.
3. Drip Edges: Fabricate in lengths not exceeding 10 feet (3 m) with 2-inch (50-mm) roof-deck flange and 1-1/2-inch (38-mm) fascia flange with 3/8-inch (9.6-mm) drip at lower edge.

C. Vent Pipe Flashings: ASTM B 749, Type L51121, at least 1/16 inch (1.6 mm) thick. Provide lead sleeve sized to slip over and turn down into pipe, soldered to skirt at slope of roof, and extending at least 4 inches (100 mm) from pipe onto roof.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

1. Examine roof sheathing to verify that sheathing joints are supported by framing and blocking or metal clips and that installation is within flatness tolerances.
2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and completely anchored; and that provision has been made for flashings and penetrations through asphalt shingles.

B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 UNDERLAYMENT INSTALLATION

A. General: Comply with underlayment manufacturer's written installation instructions applicable to products and applications indicated unless more stringent requirements apply.

B. Single-Layer Felt Underlayment: Install on roof deck parallel with and starting at the eaves. Lap sides a minimum of 2 inches (50 mm) over underlying course. Lap ends a minimum of 4 inches (100 mm). Stagger end laps between succeeding courses at least 72 inches (1830 mm). Fasten with roofing nails.

1. Install felt underlayment on roof deck not covered by self-adhering sheet underlayment. Lap sides of felt over self-adhering sheet underlayment not less than 3 inches (75 mm) in direction to shed water. Lap ends of felt not less than 6 inches (150 mm) over self-adhering sheet underlayment.
2. Install fasteners at no more than 36 inch (900 mm) o.c.

C. Double-Layer Felt Underlayment: Install on roof deck parallel with and starting at the eaves. Install a 19-inch- (485-mm-) wide starter course at eaves and completely cover with full-width second course. Install succeeding courses lapping previous courses 19 inches (485 mm) in shingle fashion. Lap ends a minimum of 6 inches (150 mm). Stagger end laps between succeeding courses at least 72 inches (1830 mm). Fasten with roofing nails.

1. Apply a continuous layer of asphalt roofing cement over starter course and on felt underlayment surface to be concealed by succeeding courses as each felt course is installed. Apply over entire roof.
2. Install felt underlayment on roof sheathing not covered by self-adhering sheet underlayment. Lap edges over self-adhering sheet underlayment not less than 3 inches (75 mm) in direction to shed water.
3. Terminate felt underlayment flush.
4. Install fasteners at no more than 36 inch (900 mm) o.c.

D. Self-Adhering Sheet Underlayment: Install, wrinkle free, on roof deck. Comply with low-temperature installation restrictions of underlayment manufacturer if applicable. Install at locations indicated below, lapped in direction to shed water. Lap sides not less than 3-1/2 inches (89 mm). Lap ends not less than 6 inches (150 mm) staggered 24 inches (600 mm) between courses. Roll laps with roller. Cover underlayment within seven days.

1. Prime concrete and masonry surfaces to receive self-adhering sheet underlayment.
2. Eaves: Extend from edges of eaves 24 inches (600 mm) beyond interior face of exterior wall.
3. Rakes: Extend from edges of rake 24 inches (600 mm) beyond interior face of exterior wall.

3.3 METAL FLASHING INSTALLATION

A. General: Install metal flashings and other sheet metal to comply with requirements in Section 076200 "Sheet Metal Flashing and Trim."

1. Install metal flashings according to recommendations in ARMA's "Residential Asphalt Roofing Manual" and asphalt shingle recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual."

B. Apron Flashings: Extend lower flange over and beyond each side of downslope asphalt shingles and up the vertical surface.

C. Step Flashings: Install with a headlap of 2 inches (50 mm) and extend over the underlying asphalt shingle and up the vertical surface. Fasten to roof deck only.

D. Cricket Flashings: Install against the roof-penetrating element extending concealed flange beneath upslope asphalt shingles and beyond each side.

E. Rake Drip Edges: Install rake drip edge flashings over underlayment and fasten to roof deck.

F. Eave Drip Edges: Install eave drip edge flashings below underlayment and fasten to roof sheathing.

G. Pipe Flashings: Form flashing around pipe penetrations and asphalt shingles. Fasten and seal to asphalt shingles as recommended by manufacturer.

3.4 ASPHALT SHINGLE INSTALLATION

A. General: Install asphalt shingles according to manufacturer's written instructions, recommendations in ARMA's "Residential Asphalt Roofing Manual," and asphalt shingle recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual."

B. Install starter strip along lowest roof edge, consisting of an asphalt shingle strip with tabs removed with self-sealing strip face up at roof edge.

1. Extend asphalt shingles 3/4 inch (19 mm) over fasciae at eaves and rakes.
2. Install starter strip along rake edge.

C. Install first and remaining courses of asphalt shingles stair-stepping diagonally across roof deck with 6-inch (150-mm) manufacturer's recommended offset pattern at succeeding courses, maintaining uniform exposure.

D. Install first and remaining courses of asphalt shingles stair-stepping diagonally across roof deck with manufacturer's recommended offset pattern at succeeding courses, maintaining uniform exposure.

E. Install asphalt shingles by single-strip column or racking method, maintaining uniform exposure. Install full-length first course followed by cut second course, repeating alternating pattern in succeeding courses.

F. Fasten asphalt shingle strips with a minimum of six roofing nails located according to manufacturer's written instructions.

1. Where roof slope exceeds 20:12, seal asphalt shingles with asphalt roofing cement spots.
2. Where roof slope is less than 4:12, seal asphalt shingles with asphalt roofing cement spots.

3. When ambient temperature during installation is below 50 deg F (10 deg C), seal asphalt shingles with asphalt roofing cement spots.

3.5 ROOFING INSTALLER'S WARRANTY

A. WHEREAS <**Insert name**> of <**Insert address**>, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:

1. Owner: <**Insert name of Owner**>.
2. Address: <**Insert address**>.
3. Building Name/Type: <**Insert information**>.
4. Address: <**Insert address**>.
5. Area of Work: <**Insert information**>.
6. Acceptance Date: <**Insert date**>.
7. Warranty Period: <**Insert time**>.
8. Expiration Date: <**Insert date**>.

B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,

C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.

D. This Warranty is made subject to the following terms and conditions:

1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:

    a. Lightning;
    b. Peak gust wind speed exceeding 80 mph (m/sec);
    c. Fire;
    d. Failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
    e. Faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
    f. Vapor condensation on bottom of roofing; and
    g. Activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.

2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
3. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.

4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.
5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.
6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.
7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

E. IN WITNESS THEREOF, this instrument has been duly executed this <**Insert day**> day of <**Insert month**>, <**Insert year**>.

1. Authorized Signature: <**Insert signature**>.
2. Name: <**Insert name**>.
3. Title: <**Insert title**>.

END OF SECTION 073113

SECTION 076200 - SHEET METAL FLASHING AND TRIM

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. Formed roof-drainage sheet metal fabrications.

1.3 COORDINATION

A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.

B. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review construction schedule. Verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Review special roof details, roof drainage, roof-penetration flashing, equipment curbs, and condition of other construction that affect sheet metal flashing and trim.
3. Review requirements for insurance and certificates if applicable.
4. Review sheet metal flashing observation and repair procedures after flashing installation.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.

B. Shop Drawings: For sheet metal flashing and trim.

1. Include plans, elevations, sections, and attachment details.

2. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work.
3. Include identification of material, thickness, weight, and finish for each item and location in Project.
4. Include details for forming, including profiles, shapes, seams, and dimensions.
5. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
6. Include details of termination points and assemblies.
7. Include details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction from fixed points.
8. Include details of roof-penetration flashing.
9. Include details of edge conditions, including eaves, ridges, valleys, rakes, crickets, and counterflashings as applicable.
10. Include details of special conditions.
11. Include details of connections to adjoining work.
12. Detail formed flashing and trim at scale of not less than 1-1/2 inches per 12 inches (1:10).

C. Samples for Initial Selection: For each type of sheet metal and accessory indicated with factory-applied finishes.

D. Samples for Verification: For each type of exposed finish.

1. Sheet Metal Flashing: 12 inches (300 mm) long by actual width of unit, including finished seam and in required profile. Include fasteners, cleats, clips, closures, and other attachments.
2. Trim, Metal Closures, Expansion Joints, Joint Intersections, and Miscellaneous Fabrications: 12 inches (300 mm) long and in required profile. Include fasteners and other exposed accessories.
3. Unit-Type Accessories and Miscellaneous Materials: Full-size Sample.
4. Anodized Aluminum Samples: Samples to show full range to be expected for each color required.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For fabricator.

B. Product Certificates: For each type of coping and roof edge flashing that is SPRI ES-1 tested and FM Approvals approved.

C. Product Test Reports: For each product, for tests performed by a qualified testing agency.

D. Sample Warranty: For special warranty.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For sheet metal flashing and trim, and its accessories, to include in maintenance manuals.

1.8 QUALITY ASSURANCE

A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

1. For copings and roof edge flashings that are SPRI ES-1 tested and FM Approvals approved, shop shall be listed as able to fabricate required details as tested and approved.

B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.

1. Build mockup of typical roof edge, including fascia trim, approximately 10 feet (3.0 m) long, including supporting construction cleats, seams, attachments and accessories.
2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.

B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

1.10 WARRANTY

A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General: Sheet metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.

B. Sheet Metal Standard for Flashing and Trim: Comply with NRCA's "The NRCA Roofing Manual" and SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.

C. FM Approvals Listing: Manufacture and install roof edge flashings that are listed in FM Approvals' "RoofNav" and approved for windstorm classification, Class 1-90. Identify materials with name of fabricator and design approved by FM Approvals.

D. SPRI Wind Design Standard: Manufacture and install roof edge flashings tested according to SPRI ES-1 and capable of resisting the following design pressure:

1. Design Pressure: As indicated on Drawings.

E. Recycled Content of Steel-Sheet Flashing and Trim: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

F. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.2 SHEET METALS

A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.

B. Aluminum Sheet: ASTM B 209 (ASTM B 209M), alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required; with smooth, flat surface.

1. As-Milled Finish: Mill.
2. Alclad Finish: Metallurgically bonded surfacing alloy on both sides, forming aluminum sheet with reflective luster.
3. Factory Prime Coating: Where painting after installation is required, pretreat metal with white or light-colored, factory-applied, baked-on epoxy primer coat; minimum dry film thickness of 0.2 mil (0.005 mm).

4. Clear Anodic Finish, Coil Coated: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.
5. Color Anodic Finish, Coil Coated: AAMA 611, AA-M12C22A42/A44, Class I, 0.018 mm or thicker.

    a. Color: Options in "Color" Subparagraph above are examples only and may vary in color range and availability among manufacturers. Retain one or delete all above and retain one of two options in "Color" Subparagraph below.
    b. Color: As selected by Architect from full range of industry colors and color densities.
    c. Color Range: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

6. Exposed Coil-Coated Finish:

    a. Two-Coat Fluoropolymer: AAMA 620. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
    b. Three-Coat Fluoropolymer: AAMA 620. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
    c. Mica Fluoropolymer: AAMA 620. Two-coat fluoropolymer finish with suspended mica flakes containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
    d. Metallic Fluoropolymer: AAMA 620. Three-coat fluoropolymer finish with suspended metallic flakes containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
    e. FEVE Fluoropolymer: AAMA 620. Two-coat fluoropolymer finish containing 100 percent fluorinated ethylene vinyl ether resin in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
    f. Siliconized Polyester: Epoxy primer and silicone-modified, polyester-enamel topcoat; with dry film thickness of not less than 0.2 mil (0.005 mm) for primer and 0.8 mil (0.02 mm) for topcoat.

7. Color: As selected by Architect from manufacturer's full range.
8. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with minimum total dry film thickness of 0.5 mil (0.013 mm).

C. Metallic-Coated Steel Sheet: Provide zinc-coated (galvanized) steel sheet according to ASTM A 653/A 653M, G90 (Z275) coating designation; prepainted by coil-coating process to comply with ASTM A 755/A 755M.

1. Surface: Smooth, flat and mill phosphatized for field painting and with manufacturer's standard clear acrylic coating on both sides.
2. Exposed Coil-Coated Finish:

    a. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
    b. Three-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
    c. Mica Fluoropolymer: AAMA 621. Two-coat fluoropolymer finish with suspended mica flakes containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
    d. Metallic Fluoropolymer: AAMA 621. Three-coat fluoropolymer finish with suspended metallic flakes containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
    e. FEVE Fluoropolymer: AAMA 621. Two-coat fluoropolymer finish containing 100 percent fluorinated ethylene vinyl ether resin in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
    f. Siliconized Polyester: Epoxy primer and silicone-modified, polyester-enamel topcoat; with dry film thickness of not less than 0.2 mil (0.005 mm) for primer and 0.8 mil (0.02 mm) for topcoat.

3. Color: As selected by Architect from manufacturer's full range.
4. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with minimum total dry film thickness of 0.5 mil (0.013 mm).

2.3 UNDERLAYMENT MATERIALS

A. Felt: ASTM D 226/D 226M, Type II (No. 30), asphalt-saturated organic felt; nonperforated.

B. Synthetic Underlayment: Laminated or reinforced, woven polyethylene or polypropylene, synthetic roofing underlayment; bitumen free; slip resistant; suitable for high temperatures over 220 deg F (111 deg C); and complying with physical requirements of ASTM D 226/D 226M for Type I and Type II felts.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

    a. Atlas Roofing Corporation; Summit.
    b. Engineered Coated Products; Nova-Seal II.
    c. Kirsch Building Products, LLC
    d. SDP Advanced Polymer Products Inc; Palisade.

C. Self-Adhering, High-Temperature Sheet: Minimum 30 mils (0.76 mm) thick, consisting of a slip-resistant polyethylene- or polypropylene-film top surface laminated to a layer of butyl- or SBS-modified asphalt adhesive, with release-paper backing; specifically designed to withstand high metal temperatures beneath metal roofing. Provide primer according to written recommendations of underlayment manufacturer.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

   a. Carlisle Residential, a division of Carlisle Construction Materials; WIP 300HT.
   b. Grace Construction Products, a unit of W. R. Grace & Co.-Conn.
   c. Henry Company; Blueskin PE200 HT.
   d. Kirsch Building Products, LLC; Sharkskin Ultra SA.
   e. Metal-Fab Manufacturing, LLC; MetShield.
   f. Owens Corning; WeatherLock Specialty Tile & Metal Underlayment.
   g. Polyguard Products, Inc.; Deck Guard HT.
   h. Protecto Wrap Company; Protecto Jiffy Seal Ice & Water Guard HT.
   i. SDP Advanced Polymer Products Inc; Palisade SA-HT.

2. Thermal Stability: ASTM D 1970; stable after testing at 240 deg F (116 deg C) or higher.
3. Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F (29 deg C) or lower.

D. Slip Sheet: Rosin-sized building paper, 3 lb/100 sq. ft. (0.16 kg/sq. m)minimum.

2.4 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal unless otherwise indicated.

B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal.

1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.

   a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
   b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
   c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.

2. Fasteners for Zinc-Tin Alloy-Coated Copper Sheet: Copper, hardware bronze or passivated Series 300 stainless steel.
3. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
4. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.

5. Fasteners for Zinc-Tin Alloy-Coated Stainless-Steel Sheet: Series 300 stainless steel.
6. Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Series 300 stainless steel or hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.
7. Fasteners for Zinc Sheet: Series 300 stainless steel or hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.

C. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.

D. Elastomeric Sealant: ASTM C 920, elastomeric silicone polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

E. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

F. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.

G. Bituminous Coating: Cold-applied asphalt emulsion according to ASTM D 1187.

H. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.5 MANUFACTURED SHEET METAL FLASHING AND TRIM

A. Through-Wall, Ribbed, Sheet Metal Flashing: Manufacture through-wall sheet metal flashing for embedment in masonry, with ribs at 3-inch (75-mm) intervals along length of flashing to provide integral mortar bond. Manufacture through-wall flashing with interlocking counterflashing on exterior face, of same metal as flashing.

1. Stainless Steel: 0.016 inch (0.40 mm) thick.

a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

1) Cheney Flashing Company; Cheney Flashing
2) Hohmann & Barnard, Inc.; STF Sawtooth Flashing.
3) Keystone Flashing Company, Inc.; Keystone Three-Way Interlocking Thruwall Flashing.
4) Sandell Manufacturing; Pre-Formed Metal Flashing.

B. Reglets: Units of type, material, and profile required, formed to provide secure interlocking of separate reglet and counterflashing pieces, and compatible with flashing indicated with interlocking counterflashing on exterior face, of same metal as reglet.

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:
2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

    a. Cheney Flashing Company.
    b. Fry Reglet Corporation.
    c. Heckmann Building Products, Inc.
    d. Hickman, W. P. Company.
    e. Hohmann & Barnard, Inc.
    f. Keystone Flashing Company, Inc.
    g. National Sheet Metal Systems, Inc.
    h. Sandell Manufacturing.

3. Material: Galvanized steel, 0.022 inch (0.56 mm) thick.
4. 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.
5. Stucco Type: Provide with upturned fastening flange and extension leg of length to match thickness of applied finish materials.
6. 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.
7. Masonry Type: Provide with offset top flange for embedment in masonry mortar joint.
8. Accessories:

    a. Flexible-Flashing Retainer: Provide resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counterflashing or where Drawings show reglet without metal counterflashing.
    b. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing's lower edge.

9. Finish: With manufacturer's standard color coating.

2.6 FABRICATION, GENERAL

A. General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required. Fabricate sheet metal flashing and trim in shop to greatest extent possible.

1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
2. Obtain field measurements for accurate fit before shop fabrication.
3. Form sheet metal flashing and trim to fit substrates without excessive oil canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
4. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.

B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines indicated on Drawings and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

C. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."

D. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.

1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with butyl sealant concealed within joints.
2. Use lapped expansion joints only where indicated on Drawings.

E. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal to provide for proper installation of elastomeric sealant according to cited sheet metal standard.

F. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.

G. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard for application, but not less than thickness of metal being secured.

H. Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.

I. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use.

J. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer.

K. Do not use graphite pencils to mark metal surfaces.

2.7 ROOF-DRAINAGE SHEET METAL FABRICATIONS

A. Hanging Gutters: Fabricate to cross section required, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in minimum 96-inch- (2400-mm-) long sections. Furnish flat-stock gutter brackets and flat-stock gutter spacers and straps fabricated from same metal as gutters, of size recommended by cited sheet metal standard but with thickness not less than twice the gutter thickness. Fabricate expansion joints, expansion-joint covers, and gutter accessories from same metal as gutters.

1. Gutter Profile: according to cited sheet metal standard.
2. Expansion Joints: Lap type.
3. Gutters with Girth up to 15 Inches (380 mm): Fabricate from the following materials:
   a. Aluminum: 0.032 inch (0.81 mm) thick.

B. Downspouts: Fabricate rectangular downspouts to dimensions indicated, complete with mitered elbows. Furnish with metal hangers from same material as downspouts and anchors.

1. Fabricated Hanger Style: according to SMACNA's "Architectural Sheet Metal Manual."
2. Manufactured Hanger Style: according to SMACNA's "Architectural Sheet Metal Manual."
3. Fabricate from the following materials:
   a. Aluminum: 0.024 inch (0.61 mm) thick.

C. Splash Pans: Fabricate to dimensions and shape required and from the following materials:
   1. Aluminum: 0.040 inch (1.02 mm) thick.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.

1. Verify compliance with requirements for installation tolerances of substrates.
2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
3. Verify that air- or water-resistant barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 UNDERLAYMENT INSTALLATION

A. Felt Underlayment: Install felt underlayment, wrinkle free, using adhesive to minimize use of mechanical fasteners under sheet metal flashing and trim. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches (50 mm).

B. Synthetic Underlayment: Install synthetic underlayment, wrinkle free, according to manufacturers' written instructions, and using adhesive where possible to minimize use of mechanical fasteners under sheet metal.

C. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Prime substrate if recommended by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer for installing underlayment at low temperatures. Apply in shingle fashion to shed water, with end laps of not less than 6 inches (150 mm) staggered 24 inches (600 mm) between courses. Overlap side edges not less than 3-1/2 inches (90 mm). Roll laps and edges with roller. Cover underlayment within 14 days.

D. Apply slip sheet, wrinkle free, over underlayment before installing sheet metal flashing and trim.

3.3 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, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.

1. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
2. 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.
3. Space cleats not more than 12 inches (300 mm) apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
4. Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.
5. Torch cutting of sheet metal flashing and trim is not permitted.
6. Do not use graphite pencils to mark metal surfaces.

B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.

1. Coat concealed side of uncoated-aluminum sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
2. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.

C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of 10 feet (3 m) with no joints within 24 inches (600 mm) of corner or intersection.

1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with sealant concealed within joints.
2. Use lapped expansion joints only where indicated on Drawings.

D. Fasteners: Use fastener sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.

E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.

F. Seal joints as required for watertight construction.

1. Use sealant-filled joints unless otherwise indicated. Embed hooked flanges of joint members not less than 1 inch (25 mm) into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is between 40 and 70 deg F (4 and 21 deg C), set joint members for 50 percent movement each way. Adjust setting

proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F (4 deg C).

2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets with solder to width of 1-1/2 inches (38 mm); however, reduce pre-tinning where pre-tinned surface would show in completed Work.

1. Do not solder metallic-coated steel and aluminum sheet.
2. Do not pre-tin zinc-tin alloy-coated stainless steel.
3. Do not use torches for soldering.
4. Heat surfaces to receive solder, and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.

H. Rivets: Rivet joints in zinc where necessary for strength.

3.4 ROOF-DRAINAGE SYSTEM INSTALLATION

A. General: Install sheet metal roof-drainage items to produce complete roof-drainage system according to cited sheet metal standard unless otherwise indicated. Coordinate installation of roof perimeter flashing with installation of roof-drainage system.

B. Hanging Gutters: Join sections with joints sealed with sealant. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchor them in position. Provide end closures and seal watertight with sealant. Slope to downspouts.

1. Fasten gutter spacers to front and back of gutter.
2. Anchor and loosely lock back edge of gutter to continuous eave or apron flashing.
3. Anchor back of gutter that extends onto roof deck with cleats spaced not more than 24 inches (600 mm) apart.
4. Anchor gutter with gutter brackets spaced not more than 30 inches (760 mm) apart to roof deck, unless otherwise indicated, and loosely lock to front gutter bead.
5. Anchor gutter with spikes and ferrules spaced not more than 24 inches (600 mm) apart.

C. Built-in Gutters: Join sections with joints sealed with sealant. Provide for thermal expansion. Slope to downspouts. Provide end closures and seal watertight with sealant.

1. Install underlayment layer in built-in gutter trough and extend to drip edge at eaves and under underlayment on roof sheathing. Lap sides minimum of 2 inches (50 mm) over underlying course. Lap ends minimum of 4 inches (100 mm). Stagger end laps between succeeding courses at least 72 inches (1830 mm). Fasten with roofing nails. Install slip sheet over underlayment.
2. Anchor and loosely lock back edge of gutter to continuous eave or apron flashing.
3. Anchor back of gutter that extends onto roof deck with cleats spaced not more than 18 inches (460 mm) apart.
4. Install gutter with expansion joints at locations indicated, but not exceeding, 50 feet (15.24 m) apart. Install expansion-joint caps.

D. Downspouts: Join sections with 1-1/2-inch (38-mm) telescoping joints.

1. Provide hangers with fasteners designed to hold downspouts securely to walls. Locate hangers at top and bottom and at approximately 60 inches (1500 mm) o.c.
2. Provide elbows at base of downspout to direct water away from building.
3. Connect downspouts to underground drainage system.

E. Splash Pans: Install where downspouts discharge on low-slope roofs. Set in elastomeric sealant compatible with the substrate.

F. Conductor Heads: Anchor securely to wall, with elevation of conductor head rim at minimum of 1 inch (25 mm) below gutter discharge.

G. Expansion-Joint Covers: Install expansion-joint covers at locations and of configuration indicated. Lap joints minimum of 4 inches (100 mm) in direction of water flow.

3.5 ROOF FLASHING INSTALLATION

A. General: Install sheet metal flashing and trim to comply with performance requirements and cited sheet metal standard. Provide concealed fasteners where possible, and set units true to line, levels, and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant.

B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at staggered 3-inch (75-mm) centers.

C. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in FM Global Property Loss Prevention Data Sheet 1-49 for FM Approvals' listing for required windstorm classification.

D. Copings: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated.

1. Interlock exterior bottom edge of coping with continuous cleat anchored to substrate at 16-inch (400-mm) centers.
2. Anchor interior leg of coping with washers and screw fasteners through slotted holes at 24-inch (600-mm) centers.

E. Copings: Anchor to resist uplift and outward forces according to recommendations in FM Global Property Loss Prevention Data Sheet 1-49 for specified FM Approvals' listing for required windstorm classification.

F. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending minimum of 4 inches (100 mm) over base flashing. Install stainless-steel draw band and tighten.

G. 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 (100 mm) over base flashing. Lap counterflashing joints minimum of 4 inches (100 mm). Secure in waterproof manner by means of interlocking folded seam or blind rivets and sealant unless otherwise indicated.

H. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof.

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.

B. Overhead-Piping Safety Pans: Suspend pans from structure above, independent of other overhead items such as equipment, piping, and conduit, unless otherwise indicated on Drawings. Pipe and install drain line to plumbing waste or drainage system.

3.7 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines indicated on Drawings and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

B. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."

3.8 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.

C. Clean off excess sealants.

D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended by sheet metal flashing and trim manufacturer. Maintain sheet metal flashing and trim in clean condition during construction.

E. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 076200

SECTION 079200 - JOINT SEALANTS

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. Silicone joint sealants.
2. Urethane joint sealants.
3. Polysulfide joint sealants.
4. Latex joint sealants.
5. Solvent-release-curing joint sealants.
6. Preformed joint sealants.
7. Acoustical joint sealants.

B. Related Sections:
1. Section 088000 "Glazing" for glazing sealants.
2. Section 092900 "Gypsum Board" for sealing perimeter joints.

1.3 PRECONSTRUCTION TESTING

A. Preconstruction Compatibility and Adhesion Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.

1. Use ASTM C 1087 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
2. Submit not fewer than eight pieces of each kind of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
4. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.
5. Testing will not be required if joint-sealant manufacturers submit joint preparation data that are based on previous testing, not older than 24 months, of sealant products for adhesion to, and compatibility with, joint substrates and other materials matching those submitted.

B. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates as follows:

1. Locate test joints where indicated on Project or, if not indicated, as directed by Architect.

2. Conduct field tests for each application indicated below:

    a. Each kind of sealant and joint substrate indicated.

3. Notify Architect seven days in advance of dates and times when test joints will be erected.
4. Arrange for tests to take place with joint-sealant manufacturer's technical representative present.

    a. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.

        1) For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.

5. Report whether sealant failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
6. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

1.4 ACTION SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

C. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- (13-mm-) wide joints formed between two 6-inch- (150-mm-) long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

D. Joint-Sealant Schedule: Include the following information:

1. Joint-sealant application, joint location, and designation.
2. Joint-sealant manufacturer and product name.
3. Joint-sealant formulation.
4. Joint-sealant color.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer and testing agency.

B. Product Certificates: For each kind of joint sealant and accessory, from manufacturer.

C. Sealant, Waterproofing, and Restoration Institute (SWRI) Validation Certificate: For each sealant specified to be validated by SWRI's Sealant Validation Program.

D. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that sealants comply with requirements.

E. Preconstruction Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:

1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.

F. Preconstruction Field-Adhesion Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on testing specified in "Preconstruction Testing" Article.

G. Field-Adhesion Test Reports: For each sealant application tested.

H. Warranties: Sample of special warranties.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

B. Source Limitations: Obtain each kind of joint sealant from single source from single manufacturer.

C. Product Testing: Test joint sealants using a qualified testing agency.

1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.
2. Test according to SWRI's Sealant Validation Program for compliance with requirements specified by reference to ASTM C 920 for adhesion and cohesion under cyclic movement, adhesion-in-peel, and indentation hardness.

D. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

E. Preinstallation Conference: Conduct conference at Project site.

1.7 PROJECT CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer.

2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.8 WARRANTY

A. Special Installer's Warranty: Manufacturer's standard form in which Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

B. Special Manufacturer's Warranty: Manufacturer's standard form in which joint-sealant manufacturer agrees to furnish joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:

1. Movement of the structure caused by structural settlement or errors attributable to design or construction resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
2. Disintegration of joint substrates from natural causes exceeding design specifications.
3. Mechanical damage caused by individuals, tools, or other outside agents.
4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

B. VOC Content of Interior Sealants: Sealants and sealant primers used inside the weatherproofing system shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

1. Architectural Sealants: 250 g/L.
2. Sealant Primers for Nonporous Substrates: 250 g/L.
3. Sealant Primers for Porous Substrates: 775 g/L.

C. Low-Emitting Interior Sealants: Sealants and sealant primers used inside the weatherproofing system shall comply with the testing and product requirements of the California Department of

Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

D. Liquid-Applied Joint Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

1. Suitability for Immersion in Liquids. Where sealants are indicated for Use I for joints that will be continuously immersed in liquids, provide products that have undergone testing according to ASTM C 1247. Liquid used for testing sealants is deionized water, unless otherwise indicated.

E. Stain-Test-Response Characteristics: Where sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

F. Suitability for Contact with Food: Where sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.

G. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 SILICONE JOINT SEALANTS

A. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 100/50, for Use NT.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Dow Corning Corporation
b. GE Advanced Materials
c. May National Associates, Inc.
d. Pecora Corporation
e. Sika Corporation, Construction Products Division
f. Tremco Incorporated

B. Multicomponent, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type M, Grade NS, Class 50, for Use NT.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Tremco Incorporated; Spectrem 4TS.

C. Multicomponent, Pourable, Traffic-Grade, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type M, Grade P, Class 100/50, for Use T.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Dow Corning Corporation; FC Parking Structure Sealant.

b. May National Associates, Inc.; Bondaflex Sil 728 RCS.

D. Mildew-Resistant, Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, for Use NT.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Pecora Corporation; 898.

E. Mildew-Resistant, Single-Component, Acid-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, for Use NT.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. BASF Building Systems; Omniplus.
b. Dow Corning Corporation; 786 Mildew Resistant.
c. GE Advanced Materials - Silicones; Sanitary SCS1700.
d. May National Associates, Inc.; Bondaflex Sil 100 WF.
e. Tremco Incorporated; Tremsil 200 Sanitary.

2.3 URETHANE JOINT SEALANTS

A. Single-Component, Nonsag, Urethane Joint Sealant: ASTM C 920, Type S, Grade NS, Class 100/50, for Use NT.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Sika Corporation, Construction Products Division; Sikaflex - 15LM.
b. Tremco Incorporated;

B. Single-Component, Pourable, Traffic-Grade, Urethane Joint Sealant: ASTM C 920, Type S, Grade P, Class 25, for Use T.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. BASF Building Systems; Sonolastic SL 1.
b. Bostik, Inc.; Chem-Calk 950.
c. May National Associates, Inc.; Bondaflex PUR 35 SL.
d. Pecora Corporation; Urexpan NR-201.
e. Polymeric Systems, Inc.; Flexiprene 952.
f. Schnee-Morehead, Inc.; Permathane SM7101.
g. Sika Corporation. Construction Products Division; Sikaflex - 1CSL.
h. Tremco Incorporated; Vulkem 45.

2.4 POLYSULFIDE JOINT SEALANTS

A. Single-Component, Nonsag, Polysulfide Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, for Use NT.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Pacific Polymers International, Inc.; Elastoseal 230 Type I.
b. W. R. Meadows, Inc.; Deck-O-Seal One Step.

B. Multicomponent, Nonsag, Polysulfide Joint Sealant: ASTM C 920, Type M, Grade NS, Class 25, for Use NT.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. BASF Building Systems; Sonolastic Polysulfide Sealant.
b. Pacific Polymers International, Inc.; Elasto-Seal 227 Type II.
c. Pecora Corporation; Synthacalk GC-2+.
d. W. R. Meadows, Inc.; Deck-O-Seal Gun Grade.

2.5 LATEX JOINT SEALANTS

A. Latex Joint Sealant: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. BASF Building Systems; Sonolac.
b. Bostik, Inc.; Chem-Calk 600.
c. May National Associates, Inc.
d. Pecora Corporation; AC-20+.
e. Schnee-Morehead, Inc.; SM 8200.
f. Tremco Incorporated; Tremflex 834.

2.6 SOLVENT-RELEASE-CURING JOINT SEALANTS

A. Acrylic-Based Joint Sealant: ASTM C 1311.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Schnee-Morehead, Inc.; Acryl-R Acrylic Sealant.
b. Tremco Incorporated; Mono 555.

B. Butyl-Rubber-Based Joint Sealant: ASTM C 1311.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

    a. Bostik, Inc.; Chem-Calk 300.
    b. Pecora Corporation; BC-158.
    c. Tremco Incorporated; Tremco Butyl Sealant.

2.7 PREFORMED JOINT SEALANTS

A. Preformed Silicone Joint Sealants: Manufacturer's standard sealant consisting of precured low-modulus silicone extrusion, in sizes to fit joint widths indicated, combined with a neutral-curing silicone sealant for bonding extrusions to substrates.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

    a. Dow Corning Corporation; 123 Silicone Seal.
    b. GE Advanced Materials - Silicones; UltraSpan US1100.
    c. May National Associates, Inc.; Bondaflex Silbridge 300.
    d. Pecora Corporation; Sil-Span.
    e. Sealex, Inc.; ImmerSeal.

B. Preformed Foam Joint Sealant: Manufacturer's standard preformed, precompressed, open-cell foam sealant manufactured from urethane foam with minimum density of 10 lb/cu. ft. (160 kg/cu. m) and impregnated with a nondrying, water-repellent agent. Factory produce in precompressed sizes in roll or stick form to fit joint widths indicated; coated on one side with a pressure-sensitive adhesive and covered with protective wrapping.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

    a. Dayton Superior Specialty Chemicals;
    b. EMSEAL Joint Systems, Ltd.
    c. Sandell Manufacturing Co., Inc.
    d. Schul International, Inc.
    e. Willseal USA, LLC

2.8 ACOUSTICAL JOINT SEALANTS

A. Acoustical Joint Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

    a. Pecora Corporation

b. USG Corporation

2.9 JOINT SEALANT BACKING

A. General: Provide sealant backings of material that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C 1330, or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.10 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and

approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.

2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:

    a. Concrete.
    b. Exterior insulation and finish systems.

3. Remove laitance and form-release agents from concrete.
4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:

    a. Metal.
    b. Glass.
    c. Porcelain enamel.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.
4. Provide flush joint profile where indicated per Figure 8B in ASTM C 1193.
5. Provide recessed joint configuration of recess depth and at locations indicated per Figure 8C in ASTM C 1193.

    a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

G. Installation of Preformed Silicone-Sealant System: Comply with the following requirements:

1. Apply masking tape to each side of joint, outside of area to be covered by sealant system.
2. Apply silicone sealant to each side of joint to produce a bead of size complying with preformed silicone-sealant system manufacturer's written instructions and covering a bonding area of not less than 3/8 inch (10 mm). Hold edge of sealant bead 1/4 inch (6 mm) inside masking tape.
3. Within 10 minutes of sealant application, press silicone extrusion into sealant to wet extrusion and substrate. Use a roller to apply consistent pressure and ensure uniform contact between sealant and both extrusion and substrate.
4. Complete installation of sealant system in horizontal joints before installing in vertical joints. Lap vertical joints over horizontal joints. At ends of joints, cut silicone extrusion with a razor knife.

H. Installation of Preformed Foam Sealants: Install each length of sealant immediately after removing protective wrapping. Do not pull or stretch material. Produce seal continuity at ends, turns, and intersections of joints. For applications at low ambient temperatures, apply heat to sealant in compliance with sealant manufacturer's written instructions.

I. Acoustical Sealant Installation: At sound-rated assemblies and elsewhere as indicated, seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written recommendations.

3.4 FIELD QUALITY CONTROL

A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:

1. Extent of Testing: Test completed and cured sealant joints as follows:

   a. Perform 10 tests for the first 1000 feet (300 m) of joint length for each kind of sealant and joint substrate.
   b. Perform 1 test for each 1000 feet (300 m) of joint length thereafter or 1 test per each floor per elevation.

2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.

   a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.

3. Inspect tested joints and report on the following:

   a. Whether sealants filled joint cavities and are free of voids.
   b. Whether sealant dimensions and configurations comply with specified requirements.
   c. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. Compare these results to determine if adhesion passes sealant manufacturer's field-adhesion hand-pull test criteria.

4. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant fill, sealant configuration, and sealant dimensions.
5. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.

B. Evaluation of Field-Adhesion Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.5 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.6 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.7 JOINT-SEALANT SCHEDULE

A. Joint-Sealant Application: Exterior joints in horizontal traffic surfaces.

1. Joint Locations:

a. Isolation and contraction joints in cast-in-place concrete slabs.
b. Joints between different materials listed above.
c. Other joints as indicated.

B. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces.

1. Joint Locations:

a. Construction joints in cast-in-place concrete.
b. Joints in exterior insulation and finish systems.
c. Joints between metal panels.
d. Joints between different materials listed above.
e. Perimeter joints between materials listed above and frames of doors, windows and louvers.
f. Control and expansion joints in ceilings and other overhead surfaces
g. Other joints as indicated.

C. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces.

1. Joint Locations:

a. Control and expansion joints on exposed interior surfaces of exterior walls.
b. Perimeter joints of exterior openings where indicated.
c. Other joints as indicated.

D. Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal nontraffic surfaces.

1. Joint Sealant Location:

a. Joints between plumbing fixtures and adjoining walls, floors, and counters.
b. Other joints as indicated.

END OF SECTION 079200

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

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 hollow-metal work.

B. Related Requirements:
1. Section 087100 "Door Hardware" for door hardware for hollow-metal doors.

1.3 DEFINITIONS

A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

1.4 COORDINATION

A. Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

1.5 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.6 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, core descriptions, temperature-rise ratings and finishes.

B. Shop Drawings: Include the following:

1. Elevations of each door type.
2. Details of doors, including vertical- and horizontal-edge details and metal thicknesses.
3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
4. Locations of reinforcement and preparations for hardware.

5. Details of each different wall opening condition.
6. Details of anchorages, joints, field splices, and connections.
7. Details of accessories.
8. Details of moldings, removable stops, and glazing.
9. Details of conduit and preparations for power, signal, and control systems.

C. Samples for Initial Selection: For units with factory-applied color finishes.

D. Samples for Verification:

1. For each type of exposed finish required, prepared on Samples of not less than 3 by 5 inches (75 by 127 mm).
2. For "Doors" and "Frames" subparagraphs below, prepare Samples approximately 8 by 10 inches (203 by 254 mm) to demonstrate compliance with requirements for quality of materials and construction:

   a. Doors: Show vertical-edge, top, and bottom construction; core construction; and hinge and other applied hardware reinforcement. Include separate section showing glazing if applicable.
   b. Frames: Show profile, corner joint, floor and wall anchors, and silencers. Include separate section showing fixed hollow-metal panels and glazing if applicable.

E. Schedule: Provide a schedule of hollow-metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final Door Hardware Schedule.

1.7 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For each type of hollow-metal door and frame assembly, for tests performed by a qualified testing agency.

B. Oversize Construction Certification: For assemblies required to be fire rated and exceeding limitations of labeled assemblies.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow-metal work palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.

1. Provide additional protection to prevent damage to factory-finished units.

B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

C. Store hollow-metal work vertically under cover at Project site with head up. Place on minimum 4-inch- (102-mm-) high wood blocking. Provide minimum 1/4-inch (6-mm) space between each stacked door to permit air circulation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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. Amweld International, LLC.
2. Apex Industries, Inc.
3. Ceco Door Products; an Assa Abloy Group company.
4. Commercial Door & Hardware Inc.
5. Concept Frames, Inc.
6. Curries Company; an Assa Abloy Group company.
7. Custom Metal Products.
8. Daybar.
9. Deansteel.
10. de La Fontaine Industries.
11. DKS Steel Door & Frame Sys. Inc.
12. Door Components, Inc.
13. Fleming-Baron Door Products.
14. Gensteel Doors Inc.
15. Greensteel Industries, Ltd.
16. HMF Express.
17. Hollow Metal Inc.
18. Hollow Metal Xpress.
19. J/R Metal Frames Manufacturing, Inc.
20. Karpen Steel Custom Doors & Frames.
21. L.I.F. Industries, Inc.
22. LaForce, Inc.
23. Megamet Industries, Inc.
24. Mesker Door Inc.
25. Michbi Doors Inc.
26. MPI Group, LLC (The).
27. National Custom Hollow Metal.
28. North American Door Corp.
29. Philipp Manufacturing Co (The).
30. Pioneer Industries, Inc.
31. Premier Products, Inc.
32. Republic Doors and Frames.
33. Rocky Mountain Metals, Inc.
34. Security Metal Products Corp.
35. Shanahans Manufacturing Ltd.
36. Steelcraft; an Ingersoll-Rand company.
37. Steward Steel; Door Division.
38. Stiles Custom Metal, Inc.
39. Titan Metal Products, Inc.
40. Trillium Steel Doors Limited.
41. West Central Mfg. Inc.

B. Source Limitations: Obtain hollow-metal work from single source from single manufacturer.

2.2 REGULATORY REQUIREMENTS

A. Fire-Rated Assemblies: Complying with NFPA 80 and listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings and temperature-rise limits indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.

1. Smoke- and Draft-Control Assemblies: Provide an assembly with gaskets listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities having jurisdiction, based on testing according to UL 1784 and installed in compliance with NFPA 105.

B. Fire-Rated, Borrowed-Light Assemblies: Complying with NFPA 80 and listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction for fire-protection ratings indicated, based on testing according to NFPA 257 or UL 9.

2.3 EXTERIOR HOLLOW-METAL DOORS AND FRAMES

A. Construct exterior doors and frames to comply with the standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

B. Hollow-Metal Doors and Frames: NAAMM-HMMA 860.

1. Physical Performance: Level A according to SDI A250.4.
2. Doors:

a. Type: As indicated in the Door and Frame Schedule.
b. Thickness: 1-3/4 inches (44.5 mm.)
c. Face: Metallic-coated steel sheet, minimum thickness of 0.042 inch (1.0 mm), with minimum G60 (Z180 or)A60 (ZF180) coating.
d. Edge Construction: Continuously welded with no visible seam.
e. Core: Steel stiffened.

1) Thermal-Rated Doors: Provide doors fabricated with thermal-resistance value (R-value) of not less than 2.1 deg F x h x sq. ft./Btu (0.370 K x sq. m/W) when tested according to ASTM C 1363.

3. Frames:

a. Materials: Metallic-coated steel sheet, minimum thickness of 0.053 inch (1.3 mm), with minimum G60 (Z180 or)A60 (ZF180) coating.
b. Construction: Full profile welded.

4. Exposed Finish: Prime.

2.4 HOLLOW-METAL PANELS

A. Provide hollow-metal panels of same materials, construction, and finish as adjacent door assemblies.

2.5 FRAME ANCHORS

A. Jamb Anchors:

1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch (1.0 mm) thick, with corrugated or perforated straps not less than 2 inches (51 mm) wide by 10 inches (254 mm) long; or wire anchors not less than 0.177 inch (4.5 mm) thick.
2. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch (1.0 mm) thick.
3. Compression Type for Drywall Slip-on Frames: Adjustable compression anchors.
4. Postinstalled Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inch-(9.5-mm-) diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.

B. Floor Anchors: Formed from same material as frames, minimum thickness of 0.042 inch (1.0 mm), and as follows:

1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
2. Separate Topping Concrete Slabs: Adjustable-type anchors with extension clips, allowing not less than 2-inch (51-mm) height adjustment. Terminate bottom of frames at finish floor surface.

2.6 MATERIALS

A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

B. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

C. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.

D. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B.

E. Frame Anchors: ASTM A 879/A 879M, Commercial Steel (CS), 04Z (12G) coating designation; mill phosphatized.

1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.

F. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.

G. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.

H. Grout: ASTM C 476, except with a maximum slump of 4 inches (102 mm), as measured according to ASTM C 143/C 143M.

I. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.

J. Glazing: Comply with requirements in Section 088000 "Glazing."

K. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15-mil (0.4-mm) dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.7 FABRICATION

A. Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.

B. Hollow-Metal Doors:

1. Steel-Stiffened Door Cores: Provide minimum thickness 0.026 inch (0.66 mm), steel vertical stiffeners of same material as face sheets extending full-door height, with vertical webs spaced not more than 6 inches (152 mm) apart. Spot weld to face sheets no more than 5 inches (127 mm) o.c. Fill spaces between stiffeners with glass- or mineral-fiber insulation.
2. Fire Door Cores: As required to provide fire-protection ratings indicated.
3. Vertical Edges for Single-Acting Doors: Provide beveled or square edges at manufacturer's discretion.
4. Top Edge Closures: Close top edges of doors with flush closures of same material as face sheets.
5. Bottom Edge Closures: Close bottom edges of doors where required for attachment of weather stripping with end closures or channels of same material as face sheets.
6. Exterior Doors: Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.
7. Astragals: Provide overlapping astragal on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch (19 mm) beyond edge of door on which astragal is mounted or as required to comply with published listing of qualified testing agency.

C. Hollow-Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.

1. Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.

2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
3. Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.
4. Floor Anchors: Weld anchors to bottoms of jambs with at least four spot welds per anchor; however, for slip-on drywall frames, provide anchor clips or countersunk holes at bottoms of jambs.
5. Jamb Anchors: Provide number and spacing of anchors as follows:

    a. Masonry Type: Locate anchors not more than 16 inches (406 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c., to match coursing, and as follows:

        1) Two anchors per jamb up to 60 inches (1524 mm) high.
        2) Three anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.
        3) Four anchors per jamb from 90 to 120 inches (2286 to 3048 mm) high.
        4) Four anchors per jamb plus one additional anchor per jamb for each 24 inches (610 mm) or fraction thereof above 120 inches (3048 mm) high.

    b. Stud-Wall Type: Locate anchors not more than 18 inches (457 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c. and as follows:

        1) Three anchors per jamb up to 60 inches (1524 mm) high.
        2) Four anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.
        3) Five anchors per jamb from 90 to 96 inches (2286 to 2438 mm) high.
        4) Five anchors per jamb plus one additional anchor per jamb for each 24 inches (610 mm) or fraction thereof above 96 inches (2438 mm) high.

    c. Compression Type: Not less than two anchors in each frame.
    d. Postinstalled Expansion Type: Locate anchors not more than 6 inches (152 mm) from top and bottom of frame. Space anchors not more than 26 inches (660 mm) o.c.

6. Head Anchors: Two anchors per head for frames more than 42 inches (1067 mm) wide and mounted in metal-stud partitions.
7. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction.

    a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
    b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.

8. Terminated Stops: Terminate stops 6 inches (152 mm) above finish floor with a 90-degree angle cut, and close open end of stop with steel sheet closure. Cover opening in extension of frame with welded-steel filler plate, with welds ground smooth and flush with frame.

D. Fabricate concealed stiffeners and edge channels from either cold- or hot-rolled steel sheet.

E. Hardware Preparation: Factory prepare hollow-metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.

1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
2. Comply with applicable requirements in SDI A250.6 and BHMA A156.115 for preparation of hollow-metal work for hardware.

F. Stops and Moldings: Provide stops and moldings around glazed lites and louvers where indicated. Form corners of stops and moldings with butted or mitered hairline joints.

1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow-metal work.
2. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.
3. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.
4. Provide loose stops and moldings on inside of hollow-metal work.
5. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.

2.8 STEEL FINISHES

A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.

1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

B. Factory Finish: Clean, pretreat, and apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat, complying with SDI A250.3.

1. Color and Gloss: As selected by Architect from manufacturer's full range.

2.9 ACCESSORIES

A. Louvers: Provide louvers for interior doors, where indicated, which comply with SDI 111C, with blades or baffles formed of 0.020-inch- (0.5-mm-) thick, cold-rolled steel sheet set into 0.032-inch- (0.8-mm-) thick steel frame.

1. Sightproof Louver: Stationary louvers constructed with inverted-V or inverted-Y blades.
2. Lightproof Louver: Stationary louvers constructed with baffles to prevent light from passing from one side to the other.

B. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.

C. Grout Guards: Formed from same material as frames, not less than 0.016 inch (0.4 mm) thick.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.

C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.

B. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

A. General: Install hollow-metal work plumb, rigid, properly aligned, and securely fastened in place. Comply with Drawings and manufacturer's written instructions.

B. Hollow-Metal Frames: Install hollow-metal frames of size and profile indicated. Comply with SDI A250.11 or NAAMM-HMMA 840 as required by standards specified.

1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.

    a. At fire-rated openings, install frames according to NFPA 80.
    b. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
    c. Install frames with removable stops located on secure side of opening.
    d. Install door silencers in frames before grouting.
    e. Remove temporary braces necessary for installation only after frames have been properly set and secured.
    f. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
    g. Field apply bituminous coating to backs of frames that will be filled with grout containing antifreezing agents.

2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.

    a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.

3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation inside frames.
4. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout.
5. Concrete Walls: Solidly fill space between frames and concrete with mineral-fiber insulation.
6. In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
7. In-Place Metal or Wood-Stud Partitions: Secure slip-on drywall frames in place according to manufacturer's written instructions.
8. Installation Tolerances: Adjust hollow-metal door frames for squareness, alignment, twist, and plumb to the following tolerances:

    a. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
    b. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
    c. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
    d. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.

C. Hollow-Metal Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.

1. Non-Fire-Rated Steel Doors:

    a. Between Door and Frame Jambs and Head: 1/8 inch (3.2 mm) plus or minus 1/32 inch (0.8 mm).
    b. Between Edges of Pairs of Doors: 1/8 inch (3.2 mm) to 1/4 inch (6.3 mm) plus or minus 1/32 inch (0.8 mm).
    c. At Bottom of Door: 5/8 inch (15.8 mm) plus or minus 1/32 inch (0.8 mm).
    d. Between Door Face and Stop: 1/16 inch (1.6 mm) to 1/8 inch (3.2 mm) plus or minus 1/32 inch (0.8 mm).

2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
3. Smoke-Control Doors: Install doors and gaskets according to NFPA 105.

D. Glazing: Comply with installation requirements in Section 088000 "Glazing" and with hollow-metal manufacturer's written instructions.

1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches (230 mm) o.c. and not more than 2 inches (51 mm) o.c. from each corner.

3.4 ADJUSTING AND CLEANING

A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow-metal work that is warped, bowed, or otherwise unacceptable.

B. Remove grout and other bonding material from hollow-metal work immediately after installation.

C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.

D. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

E. Factory-Finish Touchup: Clean abraded areas and repair with same material used for factory finish according to manufacturer's written instructions.

F. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

END OF SECTION 081113

SECTION 08 71 00

DOOR HARDWARE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions of Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes items known commercially as finish or door hardware that are required for swing, sliding, and folding doors, except special types of unique hardware specified in the same sections as the doors and door frames on which they are installed.

B. This Section includes the following, but is not necessarily limited to:

1. Door Hardware, including electric hardware.
2. Thresholds, gasketing and weather-stripping.

C. Related Sections: The following sections are noted as containing requirements that relate to this Section, but may not be limited to this listing.

1. Division 8: Section - Steel Doors and Frames.

1.03 REFERENCES (USE DATE OF STANDARD IN EFFECT AS OF BID DATE.)

A. 2022 California Building Code, CCR, Title 24.

B. BHMA – Builders' Hardware Manufacturers Association

C. CCR – California Code of Regulations, Title 24, Part 2, California State Accessibility Standards.

D. DHI – Door and Hardware Institute

E. NFPA - National Fire Protection Association.

1. NFPA 80 - Fire Doors and Other Opening Protectives
2. NFPA 105 - Smoke and Draft Control Door Assemblies

F. UL - Underwriters Laboratories.

1. UL 10C - Fire Tests of Door Assemblies
2. UL 305 - Panic Hardware

G. WHI - Warnock Hersey Incorporated

H. SDI - Steel Door Institute

1.04 SUBMITTALS & SUBSTITUTIONS

A. General: Submit in accordance with Conditions of the Contract and Division 1 Specification sections.

B. Submit product data (catalog cuts) including manufacturers' technical product information for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.

C. Submit schedule organized vertically into “Hardware Sets” with index of doors and headings, indicating complete designations of every item required for each door or opening. Include following information:

1. Include a Cover Sheet with;
   a. Job Name, location, telephone number.
   b. Architects name, location and telephone number.
   c. Contractors name, location, telephone number and job number.
   d. Suppliers name, location, telephone number and job number.
   e. Hardware consultant's name, location and telephone number.

2. Job Index information included;
   a. Numerical door number index including; door number, hardware heading number and page number.
   b. Complete keying information (referred to DHI hand-book "Keying Systems and Nomenclature"). Provision should be made in the schedule to provide keying information when available; if it is not available at the time the preliminary schedule is submitted.
   c. Manufacturers' names and abbreviations for all materials.
   d. Explanation of abbreviations, symbols, and codes used in the schedule.
   e. Mounting locations for hardware.
   f. Clarification statements or questions.
   g. Catalog cuts and manufacturer’s technical data and instructions.

3. Vertical schedule format sample:

Heading Number 1 (Hardware group or set number – HW -1)					
			(a) 1 Single Door #1 - Exterior from Corridor 101	(b) 90°	(c) RH
			(d) 3' 0"x7' 0" x 1-3/4" x (e) 20 Minute (f) WD x HM		

(g) 1	(h)	(i) ea		(j) Hinges - (k) 5BB1HW 4.5 x 4.5 NRP (l) ½ TMS	(m) 626	(n) IVE
2	6AA	1 ea		Lockset - ND50PD x RHO x RH x 10-025 x JTMS	626	SCH

(a) - Single or pair with opening number and location. (b) - Degree of opening (c) - Hand of door(s) (d) - Door and frame dimensions and door thickness. (e) - Label requirements if any. (f) - Door by frame material. (g) - (Optional) Hardware item line #. (h) - Keyset Symbol. (i) - Quantity. (j) - Product description. (k) - Product Number. (l) - Fastenings and other pertinent information. (m) - Hardware finish codes per ANSI A156.18. (n) - Manufacture abbreviation.

D. Make substitution requests in accordance with Division 1. Substitution requests must be made prior to bid date. Include product data and indicate benefit to the project. Furnish samples of any proposed substitution.

E. Keying Schedule: Submit separate detailed schedule indicating clearly how the Owner's final instructions on keying of locks has been fulfilled.

F. Templates for doors, frames, and other work specified to be factory prepared for the installation of door hardware. Check shop drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

G. Furnish as-built/as-installed schedule with close-out documents, including keying schedule and transcript, wiring/riser diagrams, manufacturers' installation and adjustment and maintenance information.

H. Fire Door Assembly Testing: Submit a written record of each fire door assembly to the Owner to be made available to the Authority Having Jurisdiction (AHJ) for future building inspections.

1.05 QUALITY ASSURANCE

A. Obtain each type of hardware (latch and lock sets, hinges, closers, exit devices, etc.) from a single manufacturer.

B. Supplier Qualifications: A recognized architectural door hardware supplier, with warehousing facilities in the project's vicinity, that has a record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this project and that employs an experienced architectural hardware consultant (AHC) who is available to Owner, Architect, and Contractor, at

reasonable times during the course of the Work, for consultation.

1. Responsible for detailing, scheduling and ordering of finish hardware.
2. Meet with Owner to finalize keying requirements and to obtain final instructions in writing.
3. Stock parts for products supplied and are capable of repairing and replacing hardware items found defective within warranty periods.

C. Hardware Installer: Company specializing in the installation of commercial door hardware with five years documented experience.

D. Fire-Rated Openings: Provide door hardware for fire-rated openings that complies with NFPA Standard No. 80 and requirements of authorities having jurisdiction. Provide only items of door hardware that are listed and tested by UL or Warnock Hersey for given type/size opening and degree of label. Provide proper latching hardware, door closers, approved-bearing hinges and seals whether listed in the Hardware Schedule or not.

1. Where emergency exit devices are required on fire-rated doors, (with supplementary marking on doors' UL labels indicating "Fire Door to be Equipped with Fire Exit Hardware") provide UL label on exit devices indicating "Fire Exit Hardware".

E. Exit Doors: Operable from inside with single motion without the use of a key or special knowledge or effort.

F. Product packaging to be labelled in compliance with CA Prop 65, Safe Drinking Water and Toxic Enforcement Act of 1986.

1.06 DELIVERY, STORAGE AND HANDLING

A. Coordinate delivery of packaged hardware items to the appropriate locations (shop or field) for installation.

B. Hardware items shall be individually packaged in manufacturers' original containers, complete with proper fasteners. Clearly mark packages on outside to indicate contents and locations in hardware schedule and in work.

C. Provide locked storage area for hardware, protect from moisture, sunlight, paint, chemicals, etc.

D. Contractor to inventory door hardware jointly with representatives of hardware supplier and hardware installer until each all are satisfied that count is correct.

1.07 WARRANTY

A. Provide warranties of respective manufacturers' regular terms of sale from day of final acceptance as follows:

1. Mechanical Locksets: Ten (10) years.
2. Closers: Thirty (30) years.
3. Mechanical exit devices: Ten (10) years
4. All other hardware: Three (3) years.

1.08 MAINTENANCE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

1.09 PRE-INSTALLATION CONFERENCE

A. Convene a pre-installation conference at least one week prior to beginning work of this section.

B. Attendance: Architect, Construction Manager, Contractor, Security Contractor, Hardware Supplier, Installer, Key Owner Personnel, and Project Inspector.

C. Agenda: Review hardware schedule, products, installation procedures and coordination required with related work. Review Owner's keying standards.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

Item	Manufacturer	Acceptable Substitutes
Hinges	Ives	Hager, Stanley, McKinney
Locks, Latches & Cylinders	Schlage	None – Owner Standard
Exit Devices	Von Duprin	None – Owner Standard
Closers	LCN	None – Owner Standard
Push, Pulls & Protection Plates	Ives	Trimco, BBW, DCI
Flush Bolts	Ives	Trimco, BBW, DCI
Dust Proof Strikes	Ives	Trimco, BBW, DCI

Coordinators	Ives	Trimco, BBW, DCI
Stops	Ives	Trimco, BBW, DCI
Overhead Stops	Glynn-Johnson	Or Approved Equal
Thresholds	Zero	Pemko, National Guard
Seals & Bottoms	Zero	Pemko, National Guard

2.02 MATERIALS

A. Hinges: Exterior out-swinging door butts shall be non-ferrous material and shall have stainless steel hinge pins. All doors to have non-rising pins.

1. Hinges shall be sized in accordance with the following:
   a. Height:
      1) Doors up to 42" wide: 4-1/2" inches.
      2) Doors 43" to 48" wide: 5 inches.
   b. Width: Sufficient to clear frame and trim when door swings 180 degrees.
   c. Number of Hinges: Furnish 3 hinges per leaf to 7'-5" in height. Add one for each additional 2 feet in height.

2. Furnish non-removable pins (NRP) at all exterior out-swing doors and interior key lock doors with reverse bevels.

B. Heavy Duty Cylindrical Locks and Latches: Schlage "ND" Series as scheduled with "Rhodes" design, fastened with through-bolts and threaded chassis hubs.

1. Provide cylindrical locksets exceeding the ANSI/BHMA A156.2 Grade 1 performance standards for strength, security, and durability in the categories below:
   a. Abusive Locked Lever Torque Test – minimum 3,100 inch-pounds without gaining access
   b. Offset lever pull – minimum 1,600 foot pounds without gaining access
   c. Vertical lever impact – minimum 100 impacts without gaining access

2. Cycle life - tested to minimum 16 million cycles per ANSI/BHMA A156.2 Cycle Test with no visible lever sag or use of performance aids such as set screws or spacers
3. UL 10C for 4’-0” x 10’-0” 3-hour fire door.
4. Cylinders: Refer to “KEYING” article, herein.
5. Provide solid steel anti-rotation through bolts and posts to control excessive rotation of lever.
6. Provide lockset that allows lock function to be changed to over twenty other common functions by swapping easily accessible parts.
7. Provide locks with standard 2-3/4 inches (70 mm) backset, unless noted otherwise, with 1/2 inch latch throw capable of UL listing of 3 hours on a 4’ x 10’ opening. Provide proper latch throw for UL listing at pairs.
8. Provide locksets with separate anti-rotation thru-bolts, and no exposed screws.
9. Provide independently operating levers with two external return spring cassettes mounted under roses to prevent lever sag.
10. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.

11. Provide wired electrified options as scheduled in the hardware sets.
    a. 12 through 24 volt DC operating capability, auto-detecting
    b. Selectable EL (fail safe)/EU (fail secure) operating mode via switch on chassis
    c. 0.230A (230mA) maximum current draw
    d. 0.010A (10mA) holding current
    e. Modular / “plug in” request to exit switch

12. Lever Trim: Solid cast levers without plastic inserts, and wrought roses on both sides.

C. Schlage “L” Series as scheduled with “06” Style Lever and “A” Style Rose.

1. Locksets to comply with ANSI A156.13, Series 1000, Operational Grade 1 and Security Grade 1 with all standard trims. Locksets shall also comply with UL10C Positive Pressure requirements
2. Lock case shall be manufactured with heavy 12 gauge steel with fully wrapped design. Lock cases with exposed edges are not acceptable. Lock case shall be multi-functional allowing transformation to a different function without opening lock case.
3. Latchbolt shall have ¾” throw and be non-handed, field reversible without opening the lock case. Solid latchbolts and / or plastic anti-friction devices are not acceptable.
4. The deadbolt, when used, shall be 1” throw stainless steel with a ¾” internal engagement when fully extended.
5. All trim shall be through-bolted with the spring cages supporting the trim attached to the lock cases to prevent torqueing.
6. Levers to have independent rotation in both directions. Exterior lever assembly to be one-piece design attached by threaded bushing. Interior lever assembly shall be attached by screwless shank
7. Thru-bolt lever assemblies through the door for positive interlock. Locks using a through the door spindle for attachment are not acceptable. Spindles shall be independent, designed to “break-away” at a maximum of 75psi torque.
8. Hand of lock chassis to be changeable by simply moving one screw from one side to the case to the other and pulling and reversing the latchbolt.
9. Cylinders to be secured by a cast stainless steel, dual retainer. Locks utilizing screws and / or stamped retainers are not acceptable.

D. Closers: LCN as scheduled. Place closers inside building, stairs, room, etc.

1. Door closer cylinders shall be of high strength cast iron construction with double heat treated pinion shaft to provide low wear operating capabilities of internal parts throughout the life of the installation. All door closers shall be tested to ANSI/BHMA A156.4 test requirements by a BHMA certified testing laboratory. A written certification showing successful completion of a minimum of 10,000,000 cycles must be provided.
2. All door closers shall be fully hydraulic and have full rack and pinion action with a shaft diameter of a minimum of 11/16 inch and piston diameter of 1 inch to ensure longevity and durability under all closer applications.
3. All parallel arm closers shall incorporate one piece solid forged steel arms with bronze bushings. 1-9/16” steel stud shoulder bolts, shall be incorporated in regular arms, hold-open arms, arms with hold open and stop built in. All other closers to have forged steel main arms for strength, durability, and aesthetics for versatility of trim accommodation, high strength and long life.
4. All parallel arm closers so detailed shall provide advanced backcheck for doors subject to severe abuse or extreme wind conditions. This advanced backcheck shall be located to begin cushioning the opening swing of the door at approximately 45 degrees. The intensity of the backcheck shall be fully adjustable by tamper resistant non-critical screw valve.

5. Closers shall be installed to permit doors to swing 180 degrees.
6. All closers shall utilize a stable fluid withstanding temperature range of 120 degrees F. to -30 degrees F. without requiring seasonal adjustment of closer speed to properly close the door.
7. Provide the manufactures drop plates, brackets and spacers as required at narrow head rails and special frame conditions. NO wood plates or spacers will be allowed.
8. Maximum effort to operate closers shall not exceed 5 lbs., such pull or push effort being applied at right angles to hinged doors. Compensating devices or automatic door operators may be utilized to meet the above standards. When fire doors are required, the maximum effort to operate the closer may be increased but shall not exceed 15 lbs. when specifically approved by fire marshal. All closers shall be adjusted to operate with the minimum amount of opening force and still close and latch the door. These forces do not apply to the force required to retract latch bolts or disengage other devices that hold the door in a closed position. Per 11B-404.2.8.1, door shall take at least 5 seconds to move from an open position of 90 degrees to a position of 12 degrees from the latch jamb.

E. Door Stops:

1. Unless otherwise noted in Hardware Sets, provide floor type with appropriate fasteners. Where wall type cannot be used, provide floor type. If neither can be used, provide overhead type.
2. Do not install floor stops more than four (4) inches from the face of the wall or partition (CBC Section 11B-307).
3. Overhead stops shall be made of stainless steel and non-plastic mechanisms and finished metal end caps. Field-changeable hold-open, friction and stop-only functions.

F. Protection Plates: Fabricate either kick, armor, or mop plates with four beveled edges. Provide kick plates 10" high and 2" LDW. Sizes of armor and mop plates shall be listed in the Hardware Schedule. Furnish with machine or wood screws of bronze or stainless to match other hardware.

G. Thresholds: As Scheduled and per details.

1. Thresholds shall not exceed 1/2" in height, with a beveled surface of 1:2 maximum slope.
2. Set thresholds in a full bed of butyl-rubber or polyisobutylene mastic sealant complying with requirements in Division 7 “Thermal and Moisture Protection”.
3. Use ¼” fasteners, red-head flat-head sleeve anchors (SS/FHSL).
4. Thresholds shall comply with CBC Section 11B-404.2.5.

H. Seals: Provide silicone gasket at all rated and exterior doors.

1. Fire-rated Doors, Resilient Seals: UL10C Classified complies with NFPA 80 & NFPA 252. Coordinate with selected door manufacturers' and selected frame manufacturers' requirements.
2. Fire-rated Doors, Intumescent Seals: Furnished by selected door manufacturer. Furnish fire-labeled opening assembly complete and in full compliance with UL10C Classified complies with NFPA 80 & NFPA 252. Where required, intumescent seals vary in requirement by door type and door manufacture -- careful coordination required.
3. Smoke & Draft Control Doors, Provide UL10C Classified complies with NFPA 80 & NFPA 252 for use on “S” labeled Positive Pressure door assemblies.

I. Door Shoes & Door Top Caps: Provide door shoes at all exterior wood doors and top caps at all exterior out-swing doors.

J. Silencers: Furnish silencers for interior hollow metal frames, 3 for single doors, 2 for pairs of doors. Omit where sound or light seals occurs, or for fire-resistive-rated door assemblies.

2.03 KEYING

A. Key permanent cylinders as directed by owner.

B. Match existing keying system.

C. Furnish all cylinders in the Schlage Full Size Interchangeable Core (FSIC). Pack change keys independently (PKI)

D. Furnish construction keying for doors requiring locking during construction.

1. For FSIC systems provide 23-030-ICX Full Size Construction Cores
2. For FSIC systems provide ten 48-101-ICX Construction Keys
3. For FSIC systems provide two 48-056-ICX Control Keys (const.)
4. For FSIC systems provide two control keys for installing the permanent cores (49-056 for “Classic” keyways, 48-052-XP for “Classic Primus”) (49-003 for “Everest Conventional”, 48-005–XP for “Everest Primus”)

E. Furnish all keys with visual key control.

1. Stamp key “Do Not Duplicate”.
2. Stamp (BHMA) key symbol on key.

F. Furnish all cylinders with visual key control

1. Stamp (BHMA) key symbol on face of cylinder plug (VKC).

G. Furnish mechanical keys as follows:

1. Furnish 2 cut change keys for each different change key code.
2. Furnish 1 uncut key blank for each change key code.
3. Furnish 6 cut masterkeys for each different masterkey set.
4. Furnish 3 uncut key blanks for each masterkey set.
5. Furnish 2 cut control keys cut to the top masterkey for permanent I/C cylinders.
6. Furnish 1 cut control key cut to each SKD combination.
7. Furnish KS43D2200 padlock for use with non-I/C Schlage cylinders. Furnish 47-413 (conventional) or 47-743-XP (PrimusXP) with above.
8. Furnish KS43G3200 padlock for use with FSIC Schlage cylinders. Furnish 23-030 (Classic / Everest) or 20-740 (PrimusXP) with above.
9. Furnish KS41D1200 padlock for use with SFIC Schlage cylinders. Furnish 80-037 (Everest-B) with above.

H. Furnish Schlage Padlocks and the cylinders to tie them into the masterkey system for gates,

storage boxes, utility valve security, roof hatches and roll-up doors keyed as directed in the keying schedule.

1. Furnish KS43D2200 padlock for use with non-I/C Schlage cylinders. Furnish 47-413 (conventional) or 47-743-XP (PrimusXP) with above.
2. Furnish KS43G3200 padlock for use with FSIC Schlage cylinders. Furnish 23-030 (Classic / Everest) or 20-740 (PrimusXP) with above.
3. Furnish KS41D1200 padlock for use with SFIC Schlage cylinders. Furnish 80-037 (Everest-B) with above.

I. Furnish one Schlage cabinet lock for each cabinet door or drawer so designated on the drawings or keying schedule to match the masterkey system.

1. Furnish CL100PB for use with non-I/C Schlage cylinders.
2. Furnish CL771R for use with FSIC Schlage cylinders.
3. Furnish CL721G for use with SFIC Schlage cylinders.

2.04 FINISHES

A. Generally to be satin chrome US26D (626 on bronze and 652 on steel) unless otherwise noted.

B. Furnish push plates, pull plates and kick or armor plates in satin stainless steel US32D (630) unless otherwise noted.

C. Door closers shall be powder-coated to match other hardware, unless otherwise noted.

D. Aluminum items to be finished anodized aluminum except thresholds which can be furnished as standard mill finish.

2.05 FASTENERS

A. Screws for strikes, face plates and similar items shall be flat head, countersunk type, provide machine screws for metal and standard wood screws for wood.

B. Screws for butt hinges shall be flathead, countersunk, full-thread type.

C. Fastening of closer bases or closer shoes to doors shall be by means of sex bolts and spray painted to match closer finish.

D. Provide expansion anchors for attaching hardware items to concrete or masonry.

E. All exposed fasteners shall have a phillips head.

F. Finish of exposed screws to match surface finish of hardware or other adjacent work.

G. All Exit Devices and Lock Protectors shall be fastened to the door by the means of sex bolts or through bolts.

PART 3 - EXECUTION

3.01 INSPECTION

A. Verify that doors and frames are square and plumb and ready to receive work and dimensions are as instructed by the manufacturer.

B. Beginning of installation means acceptance of existing conditions.

3.02 INSTALLATION

A. Install hardware in accordance with manufacturer's instructions and requirements of DHI.

B. Use the templates provided by hardware item manufacturer.

C. Mounting heights for hardware shall be as recommended by the Door and Hardware Institute. Operating hardware will to be located between 34" and 44" AFF.

D. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.

E. Drill and countersink units that are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.

F. Set thresholds for exterior doors in full bed of butyl-rubber sealant.

G. If hand of door is changed during construction, make necessary changes in hardware at no additional cost.

H. Hardware Installer shall coordinate with security contractor to route cable to connect electrified locks, panic hardware and fire exit hardware to power transfers or electric hinges at the time these items are installed so as to avoid disassembly and reinstallation of hardware.

I. Hardware Installer shall also be present with the security contractor when the power is turned on for the testing of the electronic hardware applications. Installer shall make adjustments to solenoids, latches, vertical rods and closers to insure proper and secure operation.

J. All wiring for electro-mechanical hardware mounted on the door shall be connected through the power transfer and terminated in the interface junction box specified for in the Electrical Section.

K. Conductors shall be minimum 18 gage stranded, multicolored. A minimum 12 in. loop of conductors shall be coiled in the interface junction box. Each conductor shall be permanently marked with its function.

L. If a power supply is specified in the hardware sets, all conductors shall be terminated in the power supply. Make all connections required for proper operation between the power supply and the electro-mechanical hardware. Provide the proper size conductors as specified in the manufacturer's technical documentation.

3.03 ADJUST AND CLEAN

A. Adjust and check each operating item of hardware and each door, to ensure proper operation or function of every unit. Replace units which cannot be adjusted to operate freely and smoothly as intended for the application made.

B. Clean adjacent surface soiled by hardware installation.

C. Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy, return to that work area and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.

D. Instruct Owner's Personnel in proper adjustment and maintenance of hardware finishes, during the final adjustment of hardware.

E. Continued Maintenance Service: Approximately six months after the completion of the project, the Contractor accompanied by the Architectural Hardware Consultant, shall return to the project

and re-adjust every item of hardware to restore proper functions of doors and hardware. Consult with and instruct Owner's personnel in recommended additions to the maintenance procedures. Replace hardware items which have deteriorated or failed due to faulty design, materials or installation of hardware units. Prepare a written report of current and predictable problems (of substantial nature) in the performance of the hardware.

3.04 HARDWARE LOCATIONS

A. Conform to CCR, Title 24, Part 2; and ADAAG; and the drawings for access-compliant positioning requirements for the disabled.

3.05 FIELD QUALITY CONTROL

A. Contractor is responsible for providing the services of an Architectural Hardware Consultant (AHC) or a proprietary product technician to inspect installation and certify that hardware and its installation have been furnished and installed in accordance with manufacturers' instructions and as specified herein.

3.06 SCHEDULE

A. The items listed in the following schedule shall conform to the requirements of the foregoing specifications.

B. While the hardware schedule is intended to cover all doors, and other movable parts of the building, and establish type and standard of quality, the contractor is responsible for examining the Plans and Specifications and furnishing proper hardware for all openings whether listed or not. If there are any omissions in hardware groups in regard to regular doors they shall be called to the attention of the Architect prior to bid opening for instruction; otherwise, list will be considered Complete. No extras will be allowed for omissions.

C. The Door Schedule on the Drawings indicates which hardware set is used with each door.

Abbreviation	Name
IVE	H.B. Ives
LCN	LCN Commercial Division
SCH	Schlage Lock Company
ZER	Zero International Inc

GATE

HARDWARE GROUP NO. 01

For use on Door #(s):
PR GATE PR GATE ENCL

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	CI3000		630	DDT
2	EA	Door Cord	788-18		626	SCE
1	EA	MULLION	BY GATE MANUFACTURER			
1	EA	ELEC PANIC HARDWARE	RX-QELX-PA-AX-99-L-DT-06		626	VON
1	EA	ELEC PANIC HARDWARE	RX-QELX-PA-AX-99-L-KC-06		626	VON
1	EA	RIM CYLINDER	20-057		626	SCH
2	EA	CLOSER	VERTICLOSE-2-ZILV		630	LOX
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1			CARD READER - WORK OF DIVISION 28			
1			POWER SUPPLY - WORK OF DIVISION 28			

GATE

HARDWARE GROUP NO. 02

For use on Door #(s):
SGL GATE

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	CI3000		630	DDT
1	EA	Door Cord	788-18		626	SCE
1	EA	ELEC PANIC HARDWARE	RX-QELX-PA-AX-99-L-KC-06		626	VON
1	EA	RIM CYLINDER	20-057		626	SCH
1	EA	CLOSER	VERTICLOSE-2-ZILV		630	LOX
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1			CARD READER - WORK OF DIVISION 28			
1			POWER SUPPLY - WORK OF DIVISION 28			

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GROUP NO. 01 - RESTROOM

3	EA	HINGE	5BB1HW 4.5 X 4.5	630	IVE
1	EA	PRIVACY W/DB & IND	L9496T 06A L583-363	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	4040XP	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS401/402CVX	626	IVE
1	EA	GASKETING	188SBK PSA	BK	ZER
1	EA	DOOR SWEEP	153A	A	ZER
1	EA	THRESHOLD	PER DETAIL	A	ZER

GROUP NO. 02 - JANITOR

3	EA	HINGE	5BB1HW 4.5 X 4.5	630	IVE
1	EA	VANDL STOREROOM LOCK	ND96TD RHO	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	4040XP SHCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	188SBK PSA	BK	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	PER DETAIL	A	ZER

END OF SECTION

SECTION 088000 - GLAZING

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 glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:

1. Hollow Metal Doors and Frames

1.3 DEFINITIONS

A. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.

B. Glass Thicknesses: Indicated by thickness designations in millimeters according to ASTM C 1036.

C. Interspace: Space between lites of an insulating-glass unit.

1.4 PERFORMANCE REQUIREMENTS

A. General: Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

B. Delegated Design: Design glass, including comprehensive engineering analysis according to ASTM E 1300 by a qualified professional engineer, using the following design criteria:

1. Design Wind Pressures: As indicated on Drawings.
2. Design Wind Pressures: Determine design wind pressures applicable to Project according to ASCE/SEI 7, based on heights above grade indicated on Drawings.

    a. Wind Design Data: As indicated on Drawings.
    b. Basic Wind Speed: 90 mph (40 m/s).

3. Vertical Glazing: For glass surfaces sloped 15 degrees or less from vertical, design glass to resist design wind pressure based on glass type factors for short-duration load.

4. Glass Type Factors for Wired, Patterned, and Sandblasted Glass:

    a. Short-Duration Glass Type Factor for Wired Glass: 0.5.
    b. Long-Duration Glass Type Factor for Wired Glass: 0.3.
    c. Short-Duration Glass Type Factor for Patterned Glass: 1.0.
    d. Long-Duration Glass Type Factor for Patterned Glass: 0.6.
    e. Short-Duration Glass Type Factor for Sandblasted Glass: 0.5.

5. Thickness of Patterned Glass: Base design of patterned glass on thickness at thinnest part of the glass.
6. Probability of Breakage for Sloped Glazing: For glass surfaces sloped more than 15 degrees from vertical, design glass for a probability of breakage not greater than 0.001.
7. Maximum Lateral Deflection: For glass supported on all four edges, limit center-of-glass deflection at design wind pressure to not more than 1/50 times the short-side length or 1 inch (25 mm), whichever is less.
8. Differential Shading: Design glass to resist thermal stresses induced by differential shading within individual glass lites.

C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components.

1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

1.5 PRECONSTRUCTION TESTING

A. Preconstruction Adhesion and Compatibility Testing: Test each glazing material type, tape sealant, gasket, glazing accessory, and glass-framing member for adhesion to and compatibility with elastomeric glazing sealants.

1. Testing will not be required if data are submitted based on previous testing of current sealant products and glazing materials matching those submitted.
2. Use ASTM C 1087 to determine whether priming and other specific joint-preparation techniques are required to obtain rapid, optimum adhesion of glazing sealants to glass, tape sealants, gaskets, and glazing channel substrates.
3. Test no fewer than eight Samples of each type of material, including joint substrates, shims, sealant backings, secondary seals, and miscellaneous materials.
4. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
5. For materials failing tests, submit sealant manufacturer's written instructions for corrective measures including the use of specially formulated primers.

1.6 ACTION SUBMITTALS

A. Product Data: For each glass product and glazing material indicated.

B. Glass Samples: For each type of the following products; 12 inches (300 mm) square.

1. Tinted glass.
2. Patterned glass.

3. Coated glass.

C. Glazing Accessory Samples: For gaskets, sealants and colored spacers, in 12-inch (300-mm) lengths. Install sealant Samples between two strips of material representative in color of the adjoining framing system.

D. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.

E. Delegated-Design Submittal: For glass indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.7 INFORMATIONAL SUBMITTALS

A. Qualification Data: For installers, manufacturers of insulating-glass units with sputter-coated, low-e coatings, glass testing agency and sealant testing agency.

B. Product Certificates: For glass and glazing products, from manufacturer.

C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for tinted glass, coated glass, insulating glass, glazing sealants and glazing gaskets.

1. For glazing sealants, provide test reports based on testing current sealant formulations within previous 36-month period.

D. Preconstruction adhesion and compatibility test report.

E. Warranties: Sample of special warranties.

1.8 QUALITY ASSURANCE

A. Manufacturer Qualifications for Insulating-Glass Units with Sputter-Coated, Low-E Coatings: A qualified insulating-glass manufacturer who is approved and certified by coated-glass manufacturer.

B. Installer Qualifications: A qualified installer who employs glass installers for this Project who are certified under the National Glass Association's Certified Glass Installer Program.

C. Glass Testing Agency Qualifications: A qualified independent testing agency accredited according to the NFRC CAP 1 Certification Agency Program.

D. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.

E. Source Limitations for Glass: Obtain ultraclear float glass, tinted float glass, coated float glass, laminated glass and insulating glass from single source from single manufacturer for each glass type.

F. Source Limitations for Glazing Accessories: Obtain from single source from single manufacturer for each product and installation method.

G. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.

1. GANA Publications: GANA's "Glazing Manual."
2. AAMA Publications: AAMA GDSG-1, "Glass Design for Sloped Glazing," and AAMA TIR-A7, "Sloped Glazing Guidelines."
3. IGMA Publication for Sloped Glazing: IGMA TB-3001, "Guidelines for Sloped Glazing."
4. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."

H. Safety Glazing Labeling: Where safety glazing labeling is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction or the manufacturer. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.

I. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.

J. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Install glazing in mockups specified in Section 085113 "Aluminum Windows" to match glazing systems required for Project, including glazing methods.
2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

K. Preinstallation Conference: Conduct conference at Project site.

1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Review temporary protection requirements for glazing during and after installation.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Protect glazing materials according to manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

B. Comply with insulating-glass manufacturer's written recommendations for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

1.10 PROJECT CONDITIONS

A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.

1. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or below 40 deg F (4.4 deg C).

1.11 WARRANTY

A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer's standard form in which coated-glass manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.

1. Warranty Period: 10 years from date of Substantial Completion.

B. Manufacturer's Special Warranty on Laminated Glass: Manufacturer's standard form in which laminated-glass manufacturer agrees to replace laminated-glass units that deteriorate within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.

1. Warranty Period: 10 years from date of Substantial Completion.

C. Manufacturer's Special Warranty on Insulating Glass: Manufacturer's standard form in which insulating-glass manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GLASS PRODUCTS, GENERAL

A. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass lites in thicknesses as needed to comply with requirements indicated.

1. Minimum Glass Thickness for Exterior Lites: Not less than 6.0 mm.
2. Thickness of Tinted Glass: Provide same thickness for each tint color indicated throughout Project.

B. Strength: Where float glass is indicated, provide annealed float glass, Kind HS heat-treated float glass, or Kind FT heat-treated float glass. Where heat-strengthened glass is indicated, provide Kind HS heat-treated float glass or Kind FT heat-treated float glass. Where fully tempered glass is indicated, provide Kind FT heat-treated float glass.

C. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:

1. For monolithic-glass lites, properties are based on units with lites 6.0 mm thick.
2. For laminated-glass lites, properties are based on products of construction indicated.
3. For insulating-glass units, properties are based on units of thickness indicated for overall unit and for each lite.
4. U-Factors: Center-of-glazing values, according to NFRC 100 and based on LBL's WINDOW 5.2 computer program, expressed as Btu/sq. ft. x h x deg F (W/sq. m x K).
5. Solar Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, according to NFRC 200 and based on LBL's WINDOW 5.2 computer program.
6. Visible Reflectance: Center-of-glazing values, according to NFRC 300.

2.2 GLASS PRODUCTS

A. Float Glass: ASTM C 1036, Type I, Quality-Q3, Class I (clear) unless otherwise indicated.

B. Ultraclear Float Glass: ASTM C 1036, Type I, Quality-Q3, Class I, complying with other requirements specified and with visible light transmission not less than 91 percent.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. AFG Industries, Inc.; Krystal Klear.
b. Guardian Industries Corp.; Ultrawhite.
c. Pilkington North America; Optiwhite.
d. PPG Industries, Inc.; Starphire.

C. Tempered Patterned Glass: ASTM C 1048, Kind FT (fully tempered), Type II, Class 1 (clear), Form 3; Quality-Q6,

1. Products: Subject to compliance with requirements.

2.3 LAMINATED GLASS

A. Manufacturers: Subject to compliance with requirements.

B. Laminated Glass: ASTM C 1172, and complying with testing requirements in 16 CFR 1201 for Category II materials, and with other requirements specified. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.

1. Construction: Laminate glass with polyvinyl butyral interlayer or cast-in-place and cured-transparent-resin interlayer to comply with interlayer manufacturer's written recommendations.
2. Interlayer Thickness: Provide thickness not less than that indicated and as needed to comply with requirements.
3. Interlayer Color: Clear unless otherwise indicated.

C. Windborne-Debris-Impact-Resistant Laminated Glass: ASTM C 1172, and complying with testing requirements in 16 CFR 1201 for Category II materials, with "Windborne-Debris-Impact Resistance" Paragraph in "Glass Products, General" Article, and with other requirements specified. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.

1. Construction: Laminate glass with one of the following to comply with interlayer manufacturer's written recommendations:

   a. Polyvinyl butyral interlayer.
   b. Polyvinyl butyral interlayers reinforced with polyethylene terephthalate film.
   c. Ionoplast interlayer.
   d. Cast-in-place and cured-transparent-resin interlayer.
   e. Cast-in-place and cured-transparent-resin interlayer reinforced with polyethylene terephthalate film.

2. Interlayer Thickness: Provide thickness not less than that indicated and as needed to comply with requirements.
3. Interlayer Color: Clear unless otherwise indicated.

D. Glass: Comply with applicable requirements in "Glass Products" Article as indicated by designations in "Laminated-Glass Types" Article.

2.4 GLAZING GASKETS

A. Dense Compression Gaskets: Molded or extruded gaskets of profile and hardness required to maintain watertight seal, made from one of the following:

1. Neoprene complying with ASTM C 864.
2. EPDM complying with ASTM C 864.
3. Silicone complying with ASTM C 1115.
4. Thermoplastic polyolefin rubber complying with ASTM C 1115.

B. Soft Compression Gaskets: Extruded or molded, closed-cell, integral-skinned neoprene, EPDM, silicone or thermoplastic polyolefin rubber gaskets complying with ASTM C 509, Type II, black; of profile and hardness required to maintain watertight seal.

1. Application: Use where soft compression gaskets will be compressed by inserting dense compression gaskets on opposite side of glazing or pressure applied by means of pressure-glazing stops on opposite side of glazing.

C. Lock-Strip Gaskets: Neoprene extrusions in size and shape indicated, fabricated into frames with molded corner units and zipper lock-strips, complying with ASTM C 542, black.

2.5 GLAZING SEALANTS

A. General:

1. Compatibility: Provide glazing sealants that are compatible with one another and with other materials they will contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
3. Sealants used inside the weatherproofing system, shall have a VOC content of not more than 250 g/L when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
4. Sealants used inside the weatherproofing system shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
5. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.

B. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 100/50, Use NT.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Dow Corning Corporation; 790.
b. GE Advanced Materials - Silicones; SilPruf LM SCS2700.
c. May National Associates, Inc.; Bondaflex Sil 290.
d. Pecora Corporation; 890.
e. Sika Corporation, Construction Products Division; SikaSil-C990.
f. Tremco Incorporated; Spectrem 1.

C. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 50, Use NT.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. BASF Building Systems; Omniseal 50.
b. Dow Corning Corporation
c. GE Advanced Materials - Silicones
d. May National Associates, Inc.; Bondaflex Sil 295.
e. Pecora Corporation
f. Polymeric Systems, Inc.; PSI-641.
g. Sika Corporation, Construction Products Division; SikaSil-C995.
h. Tremco Incorporated

D. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 25, Use NT.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

    a. Dow Corning Corporation; 799.
    b. GE Advanced Materials - Silicones
    c. May National Associates, Inc.
    d. Polymeric Systems, Inc.; PSI-631.
    e. Schnee-Morehead, Inc., an ITW company; SM5731 Poly-Glaze Plus.
    f. Tremco Incorporated

2.6 GLAZING TAPES

A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C 1281 and AAMA 800 for products indicated below:

1. AAMA 804.3 tape, where indicated.
2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.

B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:

1. AAMA 810.1, Type 1, for glazing applications in which tape acts as the primary sealant.
2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

2.7 MISCELLANEOUS GLAZING MATERIALS

A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.

B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

C. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.

D. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.

E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

F. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

G. Perimeter Insulation for Fire-Resistive Glazing: Product that is approved by testing agency that listed and labeled fire-resistant glazing product with which it is used for application and fire-protection rating indicated.

2.8 FABRICATION OF GLAZING UNITS

A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.

B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites to produce square edges with slight chamfers at junctions of edges and faces.

C. Grind smooth and polish exposed glass edges and corners.

2.9 MONOLITHIC-GLASS TYPES

A. Glass Type: Tempered patterned glass.

1. Thickness: 5.0 mm.
2. Provide safety glazing labeling.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:

1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
2. Presence and functioning of weep systems.
3. Minimum required face and edge clearances.
4. Effective sealing between joints of glass-framing members.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that will leave visible marks in the completed work.

3.3 GLAZING, GENERAL

A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.

B. Adjust glazing channel dimensions as required by Project conditions during installation to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

C. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.

D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.

E. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

G. Provide spacers for glass lites where length plus width is larger than 50 inches (1270 mm).

1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
2. Provide 1/8-inch (3-mm) minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.

H. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.

I. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.

J. Set glass lites with proper orientation so that coatings face exterior or interior as specified.

K. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.

L. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

3.4 TAPE GLAZING

A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.

B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.

C. Cover vertical framing joints by applying tapes to heads and sills first and then to jambs. Cover horizontal framing joints by applying tapes to jambs and then to heads and sills.

D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.

E. Do not remove release paper from tape until right before each glazing unit is installed.

F. Apply heel bead of elastomeric sealant.

G. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.

H. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.5 GASKET GLAZING (DRY)

A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.

B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.

C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

E. Install gaskets so they protrude past face of glazing stops.

3.6 SEALANT GLAZING (WET)

A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.

B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.

C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.7 LOCK-STRIP GASKET GLAZING

A. Comply with ASTM C 716 and gasket manufacturer's written instructions. Provide supplementary wet seal and weep system unless otherwise indicated.

3.8 CLEANING AND PROTECTION

A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer.

C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains; remove as recommended in writing by glass manufacturer.

D. Remove and replace glass that is broken, chipped, cracked, or abraded or that is damaged from natural causes, accidents, and vandalism, during construction period.

E. Wash glass on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

END OF SECTION 088000

SECTION 09 24 00

PORTLAND CEMENT PLASTERING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Exterior Portland cement plasterwork (stucco) on metal lath. Includes acrylic modified finish coat.
2. Slip Sheet.

B. Related Sections:

1. Section 061600 "Sheathing" for sheathing and water-resistant barriers included in Portland cement plaster assemblies.
2. Section 072100 "Thermal Insulation" for thermal insulations and vapor retarders included in Portland cement plaster assemblies.
3. Section 072500 “Weather Barriers.”
4. Section 076200 “Sheet Metal Flashing and Trim.”

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Show locations and installation of control and expansion joints including plans, elevations, sections, details of components, and attachments to other work.

C. Samples for Initial Selection: For each type of factory-prepared finish coat indicated.

D. Samples for Verification: For each type of colored finish coat indicated; 12 by 12 inches, and prepared on rigid backing.

E. Qualification Data: For Installer

F. Warranties: Special warranties specified in this Section.

1.4 QUALITY ASSURANCE

A. Mockups: Before plastering, install mockups of at least 100 sq. ft. in surface area to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Install mockups for each type of finish indicated.
2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

B. Preinstallation Conference: Conduct conference at Project site after approval of a complete submittal.

C. Applicator's Qualifications: Engage an experienced installer, who is certified, in writing by Plaster System as being qualified to install the plaster systems. The installer shall have 10 years' experience with the products to be used on this project and have successfully completed the installation of a minimum of 50,000 square feet of the specified product.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes.

1.6 PROJECT CONDITIONS

A. Comply with ASTM C 926 requirements.

B. Exterior Plasterwork:

1. Apply and cure plaster to prevent plaster drying out during curing period. Use procedures required by climatic conditions, including moist curing, providing coverings, and providing barriers to deflect sunlight and wind.
2. Apply plaster when ambient temperature is greater than 40 deg F.
3. Protect plaster coats from freezing for not less than 48 hours after set of plaster coat has occurred.

1.7 WARRANTY

A. Special Warranty: Standard form in which manufacturer agrees to repair or replace plaster system finishes that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
   a. Manufacturing defects.
   b. Structural failures including cracking in excess of 3/32 inch or by PCA standards.
   c. Shrinkage.
   d. Finish coat color fading.
   e. Failure of system to resist penetration of water.
   f. Failure of system to resist damage from wind.
   g. Hairline cracking due to temperature or shrinkage not considered structural failure.
2. Sole Source; System Warranty Period: 15 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 WEATHER BARRIER

A. Weather-Resistive Barrier and accessories underlying plaster assemblies as specified in Section 072500. Types as indicated on Drawings.

2.2 SLIP SHEET

A. Membrane: Two-ply asphalt saturated kraft Grade D breather type sheathing paper.

1. Type: “Professional Two-Ply Super Jumbo Tex 60 Minute” (Fortifiber Building Systems Group), or equal. Contractor may provide weather barrier that includes cement plaster lath and exclude this product from Section 092400. Product shall meet Federal Specification UU-B-790a, Type 1, Grade D, Style 2.
2. Moisture Vapor Transmission: 35 grams minimum; ASTM F1249.
3. Water Resistance: 150 minutes (professional), ASTM D779.

2.3 METAL LATH

A. Self-Furring, Welded Wire Lath: Structa Wire Corp “Megalath”, or equal. No. 17 ga. by no. 16 ga. galvanized steel is welded to form 0.7 in. by 1.5 in. openings. Five additional secondary cold rolled longitudinal wires, spaced 6.5 in. form a twin trac for attachment.

2.4 ACCESSORIES

A. General: Comply with ASTM C 1063 and coordinate depth of trim and accessories with thicknesses and number of plaster coats required.

B. Metal Accessories:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following, or equal:
   a. Alabama Metal Industries Corporation; a Gibraltar Industries company.
   b. CEMCO, basis of design.
   c. Clark Western Building Systems.
2. Foundation Weep Screed: Fabricated from hot-dip galvanized-steel sheet, ASTM A 653/A 653M, G90 zinc coating. Cemco "#36 Foundation Sill Screed."
3. Cornerite: Fabricated from metal lath with ASTM A 653/A 653M, G90, hot-dip galvanized zinc coating.
4. External-Corner Reinforcement: Fabricated from metal lath with ASTM A 653/A 653M, G90, hot-dip galvanized zinc coating.
5. Cornerbeads: Fabricated from zinc.
   a. Small nose cornerbead with expanded flanges; use unless otherwise indicated.
   b. Bull nose cornerbead, radius 3/4 inch minimum, with expanded flanges; use at locations indicated on Drawings.
6. Casing Beads: Fabricated from G90 galvanized zinc coating; square-edged style; with expanded flanges. Cemco "#66" square edge and extended leg.
7. Control Joints: Fabricated from G90 galvanized zinc coating; one-piece-type, folded pair of unperforated screeds in M-shaped configuration; with perforated flanges and removable protective tape on plaster face of control joint. Cemco "#XJ-15 Double J Expanded Wing Expansion Control Joint."
8. Expansion Joints As Applicable: Fabricated from G90 galvanized zinc coating; folded pair of unperforated screeds in M-shaped configuration; with expanded flanges.
9. Two-Piece Expansion Joints: Fabricated from G90 galvanized zinc coating; formed to produce slip-joint and square-edged reveal that is adjustable from 1/4 to 5/8 inch wide; with perforated flanges. Cemco "M-Slide Expansion Joint."

2.5 MISCELLANEOUS MATERIALS

A. Water for Mixing: Potable and free of substances capable of affecting plaster set or of damaging plaster, lath, or accessories.

B. Fiber for Base Coat: Alkaline-resistant glass or polypropylene fibers, 1/2 inch long, free of contaminants, manufactured for use in Portland cement plaster.

C. Bonding Compound: ASTM C 932.

D. Steel Drill Screws: For metal-to-metal fastening, ASTM C 1002 or ASTM C 954, as required by thickness of metal being fastened; with pan head that is suitable for application; in lengths required to achieve penetration through joined materials of no fewer than three exposed threads.

E. Fasteners for Attaching Metal Lath to Substrates: Complying with ASTM C 1063.

F. Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, not less than 0.0475-inch diameter, unless otherwise indicated.

2.6 PLASTER MATERIALS

A. Ready Mixed Plaster: No job-mixed plasters will be accepted.

B. Basis of Design: Provide BMI 690 Plaster, a Premixed, Reinforced and Engineered Portland cement plaster manufactured by BMI Products Milpitas, CA. www.bmi-products.com

1. Provide ready mixed products in minimum 90 lb. sacks, supersacks or delivered on-site in pre-mixed silos.
2. ICC-ES Report ESR 2535.

C. Products: Provide assemblies from BMI Products, Inc., La Habra, or equal

1. Portland Cement: ASTM C150, Type I.
2. Lime: ASTM C206, Type S or ASTM C207, Type S.
3. Sand Aggregate: ASTM C897. Provide white aggregate when used for finish coats.
4. Fiber: Propex “Fibercast 500.” ASTM C1116. Type III, performance level I.

D. Ready-Mixed Finish-Coat Plaster: Mill-mixed Portland cement, aggregates, and proprietary ingredients. Provide acylic-emulsion coating systems.

1. Products: Provide assemblies from BMI Products, Inc., La Habra, or equal. BMI Products “100% Acrylic Finish” is the basis of design. Provide recommended primers and sealing topcoats.

2.7 PLASTER MIXES

A. General: Comply with ASTM C 926 for applications indicated.

1. Fiber Content: Add fiber to scratch and brown mixes after ingredients have mixed at least two minutes. Comply with fiber manufacturer's written instructions for fiber quantities in mixes, but do not exceed 1 lb of fiber/cu. yd. of cementitious materials.

B. Base-Coat Mixes for Use over Metal Lath: Scratch and brown coats for three-coat plasterwork as follows:

1. Portland Cement Mixes:
   a. Scratch Coat: For cementitious material, mix 1 part Portland cement and 0 to 3/4 parts lime. Use 2-1/2 to 4 parts aggregate per part of cementitious material.
   b. Brown Coat: For cementitious material, mix 1 part Portland cement and 0 to 3/4 parts lime. Use 3 to 5 parts aggregate per part of cementitious material, but not less than volume of aggregate used in scratch coat.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Protect adjacent work from soiling, spattering, moisture deterioration, and other harmful effects caused by plastering.

B. Prepare solid substrates for plaster that are smooth or that do not have the suction capability required to bond with plaster according to ASTM C 926.

3.3 INSTALLING WEATHER BARRIER

A. Refer to Section 072500 for installation of weather barrier and accessories.

3.4 INSTALLING SLIP SHEET

A. Install in accordance with manufacturer’s recommendations.

3.5 INSTALLING METAL LATH

A. Self-Furring Lath: Install according to ASTM C 1063.

3.6 INSTALLING ACCESSORIES

A. Install according to ASTM C 1063 and at locations indicated on Drawings.

B. Reinforcement for External Corners:

1. Install lath-type, external-corner reinforcement at exterior locations.

C. Control Joints: Install control joints in specific locations approved by Architect for visual effect as follows:

1. As required to delineate plasterwork into areas (panels) of the following maximum sizes:
   a. Vertical Surfaces: 144 sq. ft.
   b. Horizontal and other Nonvertical Surfaces: 100 sq. ft.
2. At distances between control joints of not greater than 18 feet o.c.
3. As required to delineate plasterwork into areas (panels) with length-to-width ratios of not greater than 2-1/2:1.
4. Where control joints occur in surface of construction directly behind plaster.
5. Where plasterwork areas change dimensions, to delineate rectangular-shaped areas (panels) and to relieve the stress that occurs at the corner formed by the dimension change.
6. Cut metal lath at control joints. Fasten cut edges of lath into solid framing or metal strapping. Secure control joints into place using tie wire.

3.7 PLASTER APPLICATION

A. General: Comply with ASTM C 926.

1. Do not deviate more than plus or minus 1/4 inch in 10 feet from a true plane in finished plaster surfaces, as measured by a 10-foot straightedge placed on surface.
2. Finish plaster flush with metal frames and other built-in metal items or accessories that act as a plaster ground unless otherwise indicated. Where casing bead does not terminate plaster at metal frame, cut base coat free from metal frame before plaster sets and groove finish coat at junctures with metal.
3. Provide plaster surfaces that are ready to receive field-applied finishes indicated.

B. Walls; Base-Coat Mixes for Use over Metal Lath: Scratch and brown coats for three-coat plasterwork on exterior sheathing. Apply scratch coat to a nominal thickness of 3/8 in., brown coat to a nominal thickness of 3/8 in.

1. Portland cement mixes.

C. Plaster Finish Coats: Apply to provide finish to match Architect's sample. Apply finish coat to a nominal thickness of 1/8 in. over self-furring reinforcement surfaces for a total of 7/8 in. minimum.

D. Concealed Exterior Plasterwork: Where plaster application will be used as a base for adhered finishes, omit finish coat.

E. Curing: Moist cure base coats per CBC Table 2512.6.

1. Maintain moist conditions by fine fog spraying.
2. Cure scratch coat for a minimum of 48 hours, and maintain a minimum of 48 hours between application of scratch coat and brown coat.
3. Cure brown coat for a minimum of 48 hours, and maintain a minimum of 7 days between the application of the brown coat and finish coat. Comply with ASTM C 926 otherwise.
4. Protect work from uneven and excessive evaporation during hot, dry weather and from strong blasts of wind.

3.8 PLASTER REPAIRS

A. Repair or replace work to eliminate cracks, dents, blisters, buckles, crazing and check cracking, dry outs, efflorescence, sweat outs, and similar defects and where bond to substrate has failed.

1. Upon completion, point-up plaster around trim and other locations where plaster meets dissimilar materials.
2. Cut out and patch defective and damaged plaster.
3. Cut out and patch stained or discolored finish.
4. Repair or replace work to eliminate blisters, buckles, check cracking dry outs, efflorescence, excessive pinholes, and similar defects.
5. Repair scaffold tie holes to match and blend with adjacent surfaces.
6. Repair or replace work as necessary to comply with visual effects.

3.9 CLEANING

A. Remove plaster and protective materials from control and expansion joints, perimeter beads, and adjacent surfaces.

B. Remove stains that would adversely affect subsequent finishes on plaster.

C. When complete, plaster surfaces shall be flat or uniformly curved, true to plane; and free from scaffold and tool marks, stains, or other damage or defects and shall be uniform in texture and color.

3.10 PROTECTION

A. Remove temporary protection and enclosure of other work. Promptly remove plaster from door frames, windows, and other surfaces not indicated to be plastered. Repair

floors, walls, and other surfaces stained, marred, or otherwise damaged during plastering.

END OF SECTION

SECTION 092900 - GYPSUM BOARD

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. Interior gypsum board.
2. Exterior gypsum board for ceilings and soffits.
3. Tile backing panels.

B. Related Requirements:

1. Section 061600 "Sheathing" for gypsum sheathing for exterior walls.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For the following products:

1. Trim Accessories: Full-size Sample in 12-inch- (300-mm-) long length for each trim accessory indicated.
2. Textured Finishes: Manufacturer's standard size for each textured finish indicated and on same backing indicated for Work.

1.4 QUALITY ASSURANCE

A. Mockups: Before beginning gypsum board installation, install mockups of at least 100 sq. ft. (9 sq. m) in surface area to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Install mockups for the following:

a. Each level of gypsum board finish indicated for use in exposed locations.
b. Each texture finish indicated.

2. Apply or install final decoration indicated, including painting and wallcoverings, on exposed surfaces for review of mockups.
3. Simulate finished lighting conditions for review of mockups.

4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE AND HANDLING

A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.6 FIELD CONDITIONS

A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.

B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.

C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

C. Low-Emitting Materials: For ceiling and wall assemblies, provide materials and construction identical to those tested in assembly and complying with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.2 GYPSUM BOARD, GENERAL

A. Recycled Content of Gypsum Panel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 50 percent.

B. Regional Materials: Gypsum panel products shall be manufactured within 500 miles (800 km) of Project site from materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles (800 km) of Project site.

C. Regional Materials: Gypsum panel products shall be manufactured within 500 miles (800 km) of Project site.

D. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.3 INTERIOR GYPSUM BOARD

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. American Gypsum.
2. CertainTeed Corp.
3. Georgia-Pacific Gypsum LLC.
4. Lafarge North America Inc.
5. National Gypsum Company.
6. PABCO Gypsum.
7. Temple-Inland.
8. USG Corporation.

B. Gypsum Wallboard: ASTM C 1396/C 1396M.

1. Thickness: 1/2 inch (12.7 mm).
2. Long Edges: Tapered.

C. Gypsum Board, Type X: ASTM C 1396/C 1396M.

1. Thickness: 5/8 inch (15.9 mm).
2. Long Edges: Tapered.

D. Gypsum Ceiling Board: ASTM C 1396/C 1396M.

1. Thickness: 1/2 inch (12.7 mm).
2. Long Edges: Tapered.

E. Abuse-Resistant Gypsum Board: ASTM C 1629/C 1629M, Level 2.

1. Core: 1/2 inch (12.7 mm), regular type.
2. Long Edges: Tapered.
3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

F. Moisture- and Mold-Resistant Gypsum Board: ASTM C 1396/C 1396M. With moisture- and mold-resistant core and paper surfaces.

1. Core: 1/2 inch (12.7 mm), regular type.
2. Long Edges: Tapered.
3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.4 SPECIALTY GYPSUM BOARD

A. Gypsum Board, Type C: ASTM C 1396/C 1396M. Manufactured to have increased fire-resistive capability.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. American Gypsum; Firebloc Type C.
b. CertainTeed Corp.; ProRoc Type C.
c. Georgia-Pacific Gypsum LLC; Fireguard C.
d. Lafarge North America Inc.; Firecheck Type C.
e. National Gypsum Company; Gold Bond Fire-Shield C.
f. PABCO Gypsum; Flame Curb Type Super C.
g. Temple-Inland; Type TG-C.
h. USG Corporation; Firecode C Core.

2. Thickness: As required by fire-resistance-rated assembly indicated on Drawings.
3. Long Edges: Tapered.

B. Glass-Mat Interior Gypsum Board: ASTM C 1658/C 1658M. With fiberglass mat laminated to both sides. Specifically designed for interior use.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Georgia-Pacific Gypsum LLC; DensArmour Plus.

2. Core: 1/2 inch (12.7 mm), regular type.
3. Long Edges: Tapered.
4. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

C. Acoustically Enhanced Gypsum Board: ASTM C 1396/C 1396M. Multilayer products constructed of two layers of gypsum boards sandwiching a viscoelastic sound-absorbing polymer core.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. National Gypsum Company; Sound Break.
b. Quiet Solution, Quiet Rock.

2. Core: 1/2 inch (12.7 mm), regular type.
3. Long Edges: Tapered.

D. Skim-Coated Gypsum Board: ASTM C 1396/C 1396M. Manufactured with a factory-applied skim coat.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Lafarge North America Inc.; Rapid Deco L5.

2. Core: 1/2 inch (12.7 mm), regular type.
3. Long Edges: Tapered.

2.5 TILE BACKING PANELS

A. Glass-Mat, Water-Resistant Backing Board: ASTM C 1178/C 1178M, with manufacturer's standard edges.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. CertainTeed Corp.; GlasRoc Tile Backer.
b. Georgia-Pacific Gypsum LLC; DensShield Tile Backer.

2. Core: 1/2 inch (12.7 mm), regular type.
3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

B. Cementitious Backer Units: ANSI A118.9 and ASTM C 1288 or 1325, with manufacturer's standard edges.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. C-Cure; C-Cure Board 990.
b. CertainTeed Corp.
c. Custom Building Products
d. FinPan, Inc.
e. James Hardie Building Products, Inc.
f. National Gypsum Company, Permabase Cement Board.
g. USG Corporation; DUROCK Cement Board.

2. Thickness: 1/2 inch (12.7 mm).
3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

C. Water-Resistant Gypsum Backing Board: ASTM C 1396/C 1396M, with manufacturer's standard edges.

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. American Gypsum.
b. CertainTeed Corp.
c. Georgia-Pacific Gypsum LLC.
d. Lafarge North America Inc.
e. PABCO Gypsum.
f. Temple-Inland.
g. USG Corporation.

2. Core: 1/2 inch (12.7 mm), regular type.

2.6 TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.

1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-faced galvanized steel sheet.
2. Shapes:

a. Cornerbead.
b. Bullnose bead.
c. LC-Bead: J-shaped; exposed long flange receives joint compound.
d. L-Bead: L-shaped; exposed long flange receives joint compound.
e. U-Bead: J-shaped; exposed short flange does not receive joint compound.
f. Expansion (control) joint.
g. Curved-Edge Cornerbead: With notched or flexible flanges.

B. Exterior Trim: ASTM C 1047.

1. Material: Hot-dip galvanized steel sheet, plastic, or rolled zinc.
2. Shapes:

a. Cornerbead.
b. LC-Bead: J-shaped; exposed long flange receives joint compound.
c. Expansion (Control) Joint: One-piece, rolled zinc with V-shaped slot and removable strip covering slot opening.

2.7 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:

1. Interior Gypsum Board: Paper.
2. Exterior Gypsum Soffit Board: Paper.
3. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.
4. Tile Backing Panels: As recommended by panel manufacturer.

C. Joint Compound for Interior Gypsum Board: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.

1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.
2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use drying-type, all-purpose compound.

a. Use setting-type compound for installing paper-faced metal trim accessories.

3. Fill Coat: For second coat, use drying-type, all-purpose compound.
4. Finish Coat: For third coat, use drying-type, all-purpose compound.
5. Skim Coat: For final coat of Level 5 finish, use drying-type, all-purpose compound.

D. Joint Compound for Exterior Applications:

1. Exterior Gypsum Soffit Board: Use setting-type taping compound and setting-type, sandable topping compound.
2. Glass-Mat Gypsum Sheathing Board: As recommended by sheathing board manufacturer.

E. Joint Compound for Tile Backing Panels:

1. Glass-Mat, Water-Resistant Backing Panel: As recommended by backing panel manufacturer.
2. Cementitious Backer Units: As recommended by backer unit manufacturer.
3. Water-Resistant Gypsum Backing Board: Use setting-type taping compound and setting-type, sandable topping compound.

2.8 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.

B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.

1. Laminating adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
2. Laminating adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

C. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.

1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.
2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

D. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.

1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.
2. Recycled Content of Blankets: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 50 percent.

E. Acoustical Joint Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Accumetric LLC; BOSS 824 Acoustical Sound Sealant.
b. Grabber Construction Products; Acoustical Sealant GSC.
c. Pecora Corporation
d. Specified Technologies, Inc.; Smoke N Sound Acoustical Sealant.
e. USG Corporation; SHEETROCK Acoustical Sealant.

2. Acoustical joint sealant shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
3. Acoustical joint sealant shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

F. Thermal Insulation: As specified in Section 072100 "Thermal Insulation."

G. Vapor Retarder: As specified in Section 072100 "Thermal Insulation."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates including welded hollow-metal frames and framing, with Installer present, for compliance with requirements and other conditions affecting performance.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLYING AND FINISHING PANELS, GENERAL

A. Comply with ASTM C 840.

B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.

C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch (1.5 mm) of open space between panels. Do not force into place.

D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered

edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

E. Form control and expansion joints with space between edges of adjoining gypsum panels.

F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.

1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. (0.7 sq. m) in area.
2. Fit gypsum panels around ducts, pipes, and conduits.
3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- (6.4- to 9.5-mm-) wide joints to install sealant.

G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch- (6.4- to 12.7-mm-) wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

I. Wood Framing: Install gypsum panels over wood framing, with floating internal corner construction. Do not attach gypsum panels across the flat grain of wide-dimension lumber, including floor joists and headers. Float gypsum panels over these members or provide control joints to counteract wood shrinkage.

J. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written recommendations for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.

K. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

3.3 APPLYING INTERIOR GYPSUM BOARD

A. Install interior gypsum board in the following locations:

1. Wallboard Type: Vertical surfaces unless otherwise indicated.
2. Type X: As indicated on Drawings.
3. Flexible Type: As indicated on Drawings.
4. Ceiling Type: Ceiling surfaces.
5. Abuse-Resistant Type: As indicated on Drawings.
6. Moisture- and Mold-Resistant Type: As indicated on Drawings.
7. Skim-Coated Type: As indicated on Drawings.

B. Single-Layer Application:

1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
2. On partitions/walls, apply gypsum panels vertically (parallel to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.

    a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
    b. At stairwells and other high walls, install panels horizontally unless otherwise indicated or required by fire-resistance-rated assembly.

3. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

C. Multilayer Application:

1. On ceilings, apply gypsum board indicated for base layers before applying base layers on walls/partitions; apply face layers in same sequence. Apply base layers at right angles to framing members and offset face-layer joints one framing member, 16 inches (400 mm) minimum, from parallel base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly.
2. On partitions/walls, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.
3. On Z-furring members, apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.
4. Fastening Methods: Fasten base layers and face layers separately to supports with screws.

D. Laminating to Substrate: Where gypsum panels are indicated as directly adhered to a substrate (other than studs, joists, furring members, or base layer of gypsum board), comply with gypsum board manufacturer's written recommendations and temporarily brace or fasten gypsum panels until fastening adhesive has set.

3.4 INSTALLING TRIM ACCESSORIES

A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

B. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect.

C. Interior Trim: Install in the following locations:

1. Cornerbead: Use at outside corners.
2. Bullnose Bead: Use at outside corners.
3. LC-Bead: Use at exposed panel edges.
4. L-Bead: Use where indicated.
5. U-Bead: Use at exposed panel edges.

D. Exterior Trim: Install in the following locations:

1. Cornerbead: Use at outside corners.
2. LC-Bead: Use at exposed panel edges.

3.5 FINISHING GYPSUM BOARD

A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

B. Prefill open joints and damaged surface areas.

C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:

1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
2. Level 2: Where indicated on Drawings.
3. Level 3: Where indicated on Drawings.
4. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.

    a. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."

5. Level 5: Where indicated on Drawings.

    a. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."

E. Glass-Mat Gypsum Sheathing Board: Finish according to manufacturer's written instructions for use as exposed soffit board.

F. Glass-Mat Faced Panels: Finish according to manufacturer's written instructions.

G. Cementitious Backer Units: Finish according to manufacturer's written instructions.

3.6 PROTECTION

A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.

B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

C. Remove and replace panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 092900

SECTION 096723 - RESINOUS FLOORING

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. High-performance resinous flooring systems.

B. Related Sections:

   1. Section 079200 "Joint Sealants" for sealants installed at joints in resinous flooring systems.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include manufacturer's technical data, application instructions, and recommendations for each resinous flooring component required.

B. Samples for Initial Selection: For each type of exposed finish required.

C. Samples for Verification: For each resinous flooring system required, 6 inches (150 mm) square, applied to a rigid backing by Installer for this Project.

D. Product Schedule: For resinous flooring.

1.4 INFORMATIONAL SUBMITTALS

A. Installer Certificates: Signed by manufacturer certifying that installers comply with specified requirements.

B. Material Certificates: For each resinous flooring component, from manufacturer.

C. Material Test Reports: For each resinous flooring system.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For resinous flooring to include in maintenance manuals.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of flooring systems required for this Project.

1. Engage an installer who is certified in writing by resinous flooring manufacturer as qualified to apply resinous flooring systems indicated.

B. Source Limitations: Obtain primary resinous flooring materials, including primers, resins, hardening agents, grouting coats, and topcoats, from single source from single manufacturer. Provide secondary materials, including patching and fill material, joint sealant, and repair materials, of type and from source recommended by manufacturer of primary materials.

C. Mockups: Apply mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Apply full-thickness mockups on 48-inch- (1200-mm-) square floor area selected by Architect.

a. Include 48-inch (1200-mm) length of integral cove base with inside corner.

2. Simulate finished lighting conditions for Architect's review of mockups.
3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

D. Preinstallation Conference: Conduct conference at Project site.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original packages and containers, with seals unbroken, bearing manufacturer's labels indicating brand name and directions for storage and mixing with other components.

1.8 PROJECT CONDITIONS

A. Environmental Limitations: Comply with resinous flooring manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting resinous flooring application.

B. Lighting: Provide permanent lighting or, if permanent lighting is not in place, simulate permanent lighting conditions during resinous flooring application.

C. Close spaces to traffic during resinous flooring application and for not less than 24 hours after application unless manufacturer recommends a longer period.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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:

B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

1. American Hi-Tech Flooring Company.
2. Arizona Polymer Flooring, Inc.
3. Atlas Minerals & Chemicals, Inc.; Polymer Flooring Division.
4. BASF Construction Chemicals, Inc.; BASF Building Systems.
5. ChemMasters.
6. CornerStone Flooring & Linings.
7. Crawford Laboratories Inc.; Florock.
8. Crossfield Products Corp.; Dex-O-Tex.
9. Crown Polymers, LLC.
10. Delta Polymers, Inc.
11. DUDICK Inc.
12. Dur-A-Flex, Inc.
13. Epoxy Systems, Inc.
14. ICS Garland Inc.
15. International Coatings Inc.
16. ITW Resin Technologies.
17. Key Resin Company.
18. Marbelite International Corp.
19. Micor Company, Inc.
20. NEOGARD; Division of JONES-BLAIR.
21. Northern Industries, Inc.
22. Nox-Crete Products Group.
23. Pacific Polymers, Inc.
24. Palma, Inc.
25. POLY-CARB, Inc.
26. Polymerica, Incorporated.
27. PolySpec.
28. PPG Industries, Inc.
29. Protective Floorings & Linings, Inc.; a division of Chesterton.
30. RBC Industries, Inc.
31. ROCK-TRED Corporation.
32. Rust-Oleum Corporation.
33. Sauereisen.
34. Sherwin-Williams Company; General Polymers.
35. Specifier Products Inc.; Stonecarpet.
36. Stonhard, Inc.
37. Tamms Industries, Inc.; a division of The Euclid Chemical Company.
38. Tnemec Company, Inc.
39. Tufco International Inc.
40. Valspar Flooring.

2.2 MATERIALS

A. VOC Content of Liquid-Applied Flooring Components: Mot more than 100 g/L when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

B. Low-Emitting Materials: Flooring system shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.3 HIGH-PERFORMANCE RESINOUS FLOORING

A. Resinous Flooring: Abrasion-, impact- and chemical-resistant, high-performance-aggregate-filled, resin-based, monolithic floor surfacing designed to produce a seamless floor and integral cove base.

B. System Characteristics:

1. Color and Pattern: As selected by Architect from manufacturer's full range.
2. Wearing Surface: Textured for slip resistance.
3. Overall System Thickness: 1/8 inch (3.2 mm).

C. Body Coats:

1. Resin: Epoxy.
2. Formulation Description: High solids.
3. Application Method: Self-leveling slurry with broadcast aggregates.
    a. Thickness of Coats: 1/16 inch (1.6 mm).
    b. Number of Coats: Two.
4. Aggregates: Manufacturer's standard.

D. Topcoat: Sealing or finish coats.

1. Resin: Epoxy.
2. Formulation Description: High solids.
3. Type: Clear.
4. Finish: Matte.
5. Number of Coats: One.

E. System Physical Properties: Provide resinous flooring system with the following minimum physical property requirements when tested according to test methods indicated:

1. Compressive Strength: per ASTM C 579.
2. Tensile Strength: per ASTM C 307.
3. Flexural Modulus of Elasticity: per ASTM C 580.
4. Water Absorption: per ASTM C 413.
5. Coefficient of Thermal Expansion: per ASTM C 531.

6. Indentation: percent maximum per MIL-D-3134.
7. Impact Resistance: No chipping, cracking, or delamination and not more than 1/16-inch (1.6-mm) permanent indentation per MIL-D-3134.
8. Resistance to Elevated Temperature: No slip or flow of more than 1/16 inch (1.6 mm) per MIL-D-3134.
9. Abrasion Resistance: maximum weight loss per ASTM D 4060.
10. Flammability: Self-extinguishing per ASTM D 635.
11. Critical Radiant Flux: 0.45 W/sq. cm or greater per NFPA 253.
12. Hardness: Shore D per ASTM D 2240.
13. Bond Strength: 100 percent concrete failure per ACI 503R.

F. System Chemical Resistance: Test specimens of cured resinous flooring system are unaffected when tested according to ASTM D 543, Procedure A, for immersion.

2.4 ACCESSORIES

A. Primer: Type recommended by manufacturer for substrate and body coats indicated.

1. Formulation Description: High solids.

B. Waterproofing Membrane: Type recommended by manufacturer for substrate and primer and body coats indicated.

1. Formulation Description: High solids.

C. Reinforcing Membrane: Flexible resin formulation that is recommended by manufacturer for substrate and primer and body coats indicated and that prevents substrate cracks from reflecting through resinous flooring.

1. Formulation Description: High solids.

a. Provide fiberglass scrim embedded in reinforcing membrane.

D. Patching and Fill Material: Resinous product of or approved by resinous flooring manufacturer and recommended by manufacturer for application indicated.

PART 3 - EXECUTION

3.1 PREPARATION

A. General: Prepare and clean substrates according to resinous flooring manufacturer's written instructions for substrate indicated. Provide clean, dry substrate for resinous flooring application.

B. Concrete Substrates: Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants incompatible with resinous flooring.

1. Roughen concrete substrates as follows:

a. Shot-blast surfaces with an apparatus that abrades the concrete surface, contains the dispensed shot within the apparatus, and recirculates the shot by vacuum pickup.
b. Comply with ASTM C 811 requirements unless manufacturer's written instructions are more stringent.

2. Repair damaged and deteriorated concrete according to resinous flooring manufacturer's written instructions.
3. Verify that concrete substrates are dry and moisture-vapor emissions are within acceptable levels according to manufacturer's written instructions.

a. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with application of resinous flooring only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m) of slab area in 24 hours.
b. Perform plastic sheet test, ASTM D 4263. Proceed with application only after testing indicates absence of moisture in substrates.
c. Perform relative humidity test using in situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.

4. Alkalinity and Adhesion Testing: Verify that concrete substrates have pH within acceptable range. Perform tests recommended by manufacturer. Proceed with application only after substrates pass testing.

C. Resinous Materials: Mix components and prepare materials according to resinous flooring manufacturer's written instructions.

D. Use patching and fill material to fill holes and depressions in substrates according to manufacturer's written instructions.

E. Treat control joints and other nonmoving substrate cracks to prevent cracks from reflecting through resinous flooring according to manufacturer's written instructions.

3.2 APPLICATION

A. General: Apply components of resinous flooring system according to manufacturer's written instructions to produce a uniform, monolithic wearing surface of thickness indicated.

1. Coordinate application of components to provide optimum adhesion of resinous flooring system to substrate, and optimum intercoat adhesion.
2. Cure resinous flooring components according to manufacturer's written instructions. Prevent contamination during application and curing processes.
3. At substrate expansion and isolation joints, comply with resinous flooring manufacturer's written instructions.

B. Apply primer over prepared substrate at manufacturer's recommended spreading rate.

C. Apply waterproofing membrane, where indicated, in manufacturer's recommended thickness.

1. Apply waterproofing membrane to integral cove base substrates.

D. Apply reinforcing membrane to entire substrate surface.

E. Integral Cove Base: Apply cove base mix to wall surfaces before applying flooring. Apply according to manufacturer's written instructions and details including those for taping, mixing, priming, troweling, sanding, and topcoating of cove base. Round internal and external corners.

1. Integral Cove Base: 6 inches high.

F. Apply self-leveling slurry body coats in thickness indicated for flooring system.

1. Broadcast aggregates at rate recommended by manufacturer and, after resin is cured, remove excess aggregates to provide surface texture indicated.

G. Apply troweled or screeded body coats in thickness indicated for flooring system. Hand or power trowel and grout to fill voids. When cured, remove trowel marks and roughness using method recommended by manufacturer.

H. Apply grout coat, of type recommended by resinous flooring manufacturer, to fill voids in surface of final body coat and to produce wearing surface indicated.

I. Apply topcoats in number indicated for flooring system and at spreading rates recommended in writing by manufacturer.

3.3 FIELD QUALITY CONTROL

A. Core Sampling: At the direction of Owner and at locations designated by Owner, take one core sample per 1000 sq. ft. (92.9 sq. m) of resinous flooring, or portion of, to verify thickness. For each sample that fails to comply with requirements, take two additional samples. Repair damage caused by coring and correct deficiencies.

B. Material Sampling: Owner may at any time and any number of times during resinous flooring application require material samples for testing for compliance with requirements.

1. Owner will engage an independent testing agency to take samples of materials being used. Material samples will be taken, identified, sealed, and certified in presence of Contractor.
2. Testing agency will test samples for compliance with requirements, using applicable referenced testing procedures or, if not referenced, using testing procedures listed in manufacturer's product data.
3. If test results show applied materials do not comply with specified requirements, pay for testing, remove noncomplying materials, prepare surfaces coated with unacceptable materials, and reapply flooring materials to comply with requirements.

3.4 PROTECTION

A. Protect resinous flooring from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by resinous flooring manufacturer.

END OF SECTION 096723

SECTION 097720 – DECORATIVE FIBERGLASS REINFORCED WALL PANELS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: Prefinished polyester glass reinforced plastic sheets and adhered to unfinished cementitious wallboard, trim and base.

1.02 REFERENCES

A. American Society for Testing and Materials: Standard Specifications (ASTM):

1. ASTM D 790 – Flexural Strengths (psi).
2. ASTM D 790 – Flexural Modulus (psi)
3. ASTM D 638 – Tensile Strengths (psi)
4. ASTM D 638 – Tensile Modulus (psi)
5. ASTM D 2583 – Barcol Hardness
6. ASTM D 256 - Izod Impact Strengths (ft #/in)
7. ASTM D 696 – Thermal Coefficient of Lineal Expansion (in/in/F)
8. ASTM D 570 – Water Absorption (%)
9. ASTM D 792 – Specific Gravity
10. ASTM D 3359 – Cross-cut Adhesion
11. ASTM D 3273 – Mold & Mildew
12. ASTM D 5319 - Standard Specification for Glass-Fiber Reinforced Polyester Wall and Ceiling Panels.
13. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's data to indicate compliance with these specifications, including: Storage, handling and preparation instructions and recommendations.

B. Shop Drawings: Submit elevations of each wall showing location of paneling and trim members with respect to all discontinuities in the wall elevation.

C. Selection Samples: Submit manufacturer’s standard color pattern selection samples representing manufacturer's full range of available colors and patterns.

D. Samples for Verification: Submit appropriate section of panel for each finish selected indicating the color, texture, and pattern required.

1. Submit complete with specified applied finish.
2. For selected patterns show complete pattern repeat.

3. Exposed Trim Molding: Provide samples of each type, finish, and color.

E. Manufacturers Safety Data Sheets (SDS) for adhesives, sealants and other pertinent materials prior to their delivery to the site (available as downloads for most Marlite's products at http://www.marlite.com/tech-details.aspx or by contacting Marlite at info@marlite.com).

1.04 QUALITY ASSURANCE

A. Conform to building code requirements for interior finish for smoke and flame spread requirements as tested in accordance with: ASTM E 84 (Method of test for surface burning characteristics of building Materials)

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver materials factory packaged on strong pallets.

B. Store panels and trim lying flat, under cover and protected from the elements. Allow panels and adhesive to acclimate to room temperature (range of 60 to 75°F) for 48 hours prior to installation.

1.06 PROJECT CONDITIONS

A. Environmental Limitations: Building are to be fully enclosed prior to installation with heat (70° or similar room temperature) and ventilation consistent with good working conditions for finish work.

B. During installation and for not less than 48 hours before, maintain an ambient temperature and relative humidity within limits required by type of adhesive used and recommendation of adhesive manufacturer. Provide ventilation to disperse fumes during application of adhesive as recommended by the adhesive manufacturer

1.07 WARRANTY

A. Furnish one-year guarantee against defects in material.

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURER

A. Marlite; 1 Marlite Drive, Dover, OH 44622. 800-377-1221 FAX (330) 343-4668 Email: info@marlite.com www.marlite.com.

B. Product: Symmetrix™ SmartSeam FRP Panels with Sani-coat Sealer.

2.02 PANELS

A. Fiberglass reinforced thermosetting polyester resin panel sheets complying with ASTM D 5319. Finishing: BlueSky™ Advanced Finishing System: Spray-applied Sani-coat Sealer covers entire panel including grooves and features water-based coatings and controlled, low-temperature inline curing.

B. Properties: Resistant to rot, corrosion, denting, peeling, and splintering.

1. Flexural Strength – 0.9 x 10^4 psi per ASTM D 790
2. Flexural Modulus – 6.0 x 10^6 psi per ASTM D 790
3. Tensile Strength – 11.5 x 10^3 psi per ASTM D 638
4. Tensile Modulus – 0.45 x 10^6 psi per ASTM D 638
5. Barcol Hardness (scratch resistance) – 28 per ASTM D 2583
6. Izod Impact Strength – 6.0 ft. lbs./in ASTM D 256
7. Thermal Coefficient of Lineal Expansion – 2.22 x 10^{-5} in/in/F per ASTM D 696
8. Water Absorption – 0.15% per ASTM D 570
9. Specific Gravity – 1.8 per ASTM D 792
10. Cross-cut Adhesion – 0 removed per ASTM D 3359
11. Mold & Mildew – Pass per ASTM D 3273
12. Standard Specification for FRP Wall Panels – per ASTM D 5319
13. Standard Test Method Surface Burning Characteristics of Building Materials – Class C per ASTM E 84.

C. Back Surface: Smooth. Imperfections which do not affect functional properties are not cause for rejection.

D. Height: As indicated on Drawings.

E. Colors: As selected by Architect from full range of industry colors.

2.03 BASE

A. Marlite Base Molding for 0.090” (2.29mm) thick FRP Panels.

B. Profiles:

1. M 612 FRP Base Molding, 10’ length.
2. M 651 Inside Corner

C. Colors: As selected by Architect from full range of industry colors.

2.04 ACCESSORIES

A. Adhesive: Either of the following construction adhesives complying with ASTM C 557.
1. Marlite C-551 FRP Adhesive - Water- resistant, non-flammable adhesive.
2. Titebond Advanced Polymer Panel Adhesive – VOC compliant, non-flammable, environmentally safe adhesive.
3. Marlite C-109 Low VOC Cartridge Adhesive required for interlocking SmartSeam Panels.

B. Sealant:
   1. Marlite Brand MS-250 Clear Silicone Sealant.
   2. Marlite Brand MS-251 White Silicone Sealant.
   3. Marlite Brand - Color Match Sealant.

PART 3 – EXECUTION

3.01 PREPARATION

A. Examine sub wall to determine that corners are plumb and straight, surfaces are smooth, uniform, clean and free from foreign matter, nails countersunk, joints and cracks filled flush and smooth with the adjoining surface. Verify that stud spacing does not exceed 24” (61cm) on-center.

B. Repair defects prior to installation. Level wall surfaces to panel manufacturer’s requirements. Remove protrusions and fill indentations.

3.02 INSTALLATION

A. Comply with manufacturer's recommended procedures and installation sequence.

B. Cut panels to meet supports allowing 1/8” clearance for every 8 foot of panel. Cut and drill with carbide tipped saw blades or drill bits, or cut with shears.

C. Apply panels to board substrate, above base, vertically oriented with seams plumb and pattern aligned with adjoining panels. Install panels with manufacturer's recommended gap for panel field and corner joints. Adhesive trowel and application method to conform to adhesive manufacturer’s recommendations. For interlocking SmartSeam Panels (non-continuous vertical joints, i.e. subway groove configuration), apply Marlite C-109 Low VOC Cartridge adhesive using swirl technique at jagged panel edges.

D. Apply panel moldings to all panel edges using silicone sealant providing for required clearances. All moldings must provide for a minimum 1/8” of panel expansion at joints and edges, to insure proper installation. Apply sealant to all moldings, channels and joints between the system and different materials to assure watertight installation.

3.03 CLEANING

A. Remove excess sealant from panels and moldings. Wipe panel down using a damp cloth and mild soap solution or cleaner.

B. Refer to manufacturer's specific cleaning recommendations Do not use abrasive cleaners.

END OF SECTION

SECTION 099113 - EXTERIOR PAINTING

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 surface preparation and the application of paint systems on the following exterior substrates:
   1. Steel.
   2. Aluminum (not anodized or otherwise coated).
   3. Wood.
   4. Exterior Portland cement plaster (stucco).

1.3 DEFINITIONS

A. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.

B. Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

C. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.

D. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.

E. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.

F. Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

B. Samples for Initial Selection: For each type of topcoat product.

C. Samples for Verification: For each type of paint system and each color and gloss of topcoat.

   1. Submit Samples on rigid backing, 8 inches (200 mm) square.
   2. Step coats on Samples to show each coat required for system.

3. Label each coat of each Sample.
4. Label each Sample for location and application area.

D. Product List: For each product indicated, include the following:

1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
2. Printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
3. VOC content.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Paint: 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.

1.6 QUALITY ASSURANCE

A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.

a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).
b. Other Items: Architect will designate items or areas required.

2. Final approval of color selections will be based on mockups.

a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.

3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.8 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).

B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following
1. Benjamin Moore & Co.
2. Dunn-Edwards Corporation.
3. Kelly-Moore Paints.
4. Sherwin-Williams Company (The).

B. Products: Subject to compliance with requirements, provide product listed in other Part 2 articles for the paint category indicated.

2.2 PAINT, GENERAL

A. MPI Standards: Provide products that comply with MPI standards indicated and that are listed in its "MPI Approved Products List."

B. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

C. VOC Content: Provide materials that comply with VOC limits of authorities having jurisdiction.

D. Colors: As selected by Architect from manufacturer's full range.

2.3 PRIMERS/SEALERS

A. Primer, Alkali Resistant, Water Based: MPI #3.

B. Primer, Bonding, Water Based: MPI #17.

C. Primer, Bonding, Solvent Based: MPI #69.

2.4 METAL PRIMERS

A. Primer, Alkyd, Anti-Corrosive for Metal: MPI #79.

B. Primer, Alkyd, Quick Dry, for Metal: MPI #76.

C. Primer, Galvanized, Water Based: MPI #134.

D. Primer, Galvanized: As recommended in writing by topcoat manufacturer.

E. Primer, Quick Dry, for Aluminum: MPI #95.

2.5 WOOD PRIMERS

A. Primer, Latex for Exterior Wood: MPI #6.

B. Primer, Alkyd for Exterior Wood: MPI #5.

C. Primer, Oil for Exterior Wood: MPI #7.

2.6 WATER-BASED PAINTS

A. Latex, Exterior Flat (Gloss Level 1): MPI #10.

B. Latex, Exterior Low Sheen (Gloss Level 3-4): MPI #15.

C. Latex, Exterior Semi-Gloss (Gloss Level 5): MPI #11.

D. Latex, Exterior, Gloss (Gloss Level 6: MPI #119.

E. Light Industrial Coating, Exterior, Water Based (Gloss Level 3): MPI #161.

F. Light Industrial Coating, Exterior, Water Based, Semi-Gloss (Gloss Level 5): MPI #163.

G. Light Industrial Coating, Exterior, Water Based, Gloss (Gloss Level 6): MPI #164.

2.7 SOLVENT-BASED PAINTS

A. Alkyd, Exterior Flat (Gloss Level 1): MPI #8.

B. Alkyd, Exterior, Semi-Gloss (Gloss Level 5): MPI #94.

C. Alkyd, Exterior Gloss (Gloss Level 6): MPI #9.

D. Alkyd, Quick Dry, Semi-Gloss (Gloss Level 5): MPI #81.

E. Alkyd, Quick Dry, Gloss (Gloss Level 7): MPI #96.

2.8 SOURCE QUALITY CONTROL

A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:

1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
2. Testing agency will perform tests for compliance with product requirements.
3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Wood: 15 percent.
2. Portland Cement Plaster: 12 percent.

C. Portland Cement Plaster Substrates: Verify that plaster is fully cured.

D. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

E. Proceed with coating application only after unsatisfactory conditions have been corrected.

1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates and paint systems indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

D. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer, but not less than the following:

1. SSPC-SP 2, "Hand Tool Cleaning."
2. SSPC-SP 3, "Power Tool Cleaning."
3. SSPC-SP 7/NACE No. 4, "Brush-off Blast Cleaning."
4. SSPC-SP 11, "Power Tool Cleaning to Bare Metal."

E. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

F. Aluminum Substrates: Remove loose surface oxidation.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Manual."

1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.
3. Paint both sides and edges of exterior doors and entire exposed surface of exterior door frames.
4. Paint entire exposed surface of window frames and sashes.
5. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
6. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

B. Tint undercoats same color as topcoat, but tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Provide sufficient difference in shade of undercoats to distinguish each separate coat.

C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

E. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:

1. Paint the following work where exposed to view:

a. Equipment, including panelboards and switch gear.
b. Uninsulated metal piping.
c. Uninsulated plastic piping.
d. Pipe hangers and supports.
e. Metal conduit.
f. Plastic conduit.

3.4 FIELD QUALITY CONTROL

A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.

1. Contractor shall touch up and restore painted surfaces damaged by testing.
2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 EXTERIOR PAINTING SCHEDULE

A. Steel Substrates:

1. Water-Based Light Industrial Coating System:

a. Prime Coat: Primer, alkyd, anti-corrosive for metal, MPI #79.

b. Prime Coat: Shop primer specified in Section where substrate is specified.
c. Intermediate Coat: Light industrial coating, exterior, water based, matching topcoat.
d. Topcoat: Light industrial coating, exterior, water based (Gloss Level 3), MPI #161.
e. Topcoat: Light industrial coating, exterior, water based, semi-gloss (Gloss Level 5), MPI #163.
f. Topcoat: Light industrial coating, exterior, water based, gloss (Gloss Level 6), MPI #164.

2. Alkyd System:

a. Prime Coat: Primer, alkyd, anticorrosive for metal, MPI #79.
b. Prime Coat: Shop primer specified in Section where substrate is specified.
c. Intermediate Coat: Exterior alkyd enamel matching topcoat.
d. Topcoat: Alkyd, exterior, flat (Gloss Level 1), MPI #8.
e. Topcoat: Alkyd, exterior, semi-gloss (Gloss Level 5), MPI #94.
f. Topcoat: Alkyd, exterior, gloss (Gloss Level 6), MPI #9.

3. Quick-Drying Enamel System:

a. Prime Coat: Primer, alkyd, quick dry, for metal, MPI #76.
b. Intermediate Coat: Alkyd, quick dry, matching topcoat.
c. Topcoat: Alkyd, quick dry, semi-gloss (Gloss Level 5), MPI #81.
d. Topcoat: Alkyd, quick dry, gloss (Gloss Level 7), MPI #96.

4. Aluminum Paint System:

a. Prime Coat: Primer, alkyd, anti-corrosive for metal, MPI #79.
b. Prime Coat: Shop primer specified in Section where substrate is specified.
c. Intermediate Coat: Aluminum paint, MPI #1.
d. Topcoat: Aluminum paint, MPI #1.

B. Aluminum Substrates:

1. Latex System:

a. Prime Coat: Primer, quick dry, for aluminum, MPI #95.
b. Intermediate Coat: Latex, exterior, matching topcoat.
c. Topcoat: Latex, exterior flat (Gloss Level 1), MPI #10.
d. Topcoat: Latex, exterior, low sheen (Gloss Level 3-4), MPI #15.
e. Topcoat: Latex, exterior semi-gloss (Gloss Level 5), MPI #11.
f. Topcoat: Latex, exterior gloss (Gloss Level 6), MPI #119.

2. Water-Based Light Industrial Coating System:

a. Prime Coat: Primer, quick dry, for aluminum, MPI #95.
b. Intermediate Coat: Light industrial coating, exterior, water based, matching topcoat.
c. Topcoat: Light industrial coating, exterior, water based (Gloss Level 3), MPI #161.

d. Topcoat: Light industrial coating, exterior, water based, semi-gloss (Gloss Level 5), MPI #163.
e. Topcoat: Light industrial coating, exterior, water based, gloss (Gloss Level 6)[, MPI #164].

3. Alkyd System:

a. Prime Coat: Primer, quick dry, for aluminum, MPI #95].
b. Intermediate Coat: Exterior alkyd enamel matching topcoat.
c. Topcoat: Alkyd, exterior, flat (Gloss Level 5), MPI #8.
d. Topcoat: Alkyd, exterior, semi-gloss (Gloss Level 5), MPI #94.
e. Topcoat: Alkyd, exterior, gloss (Gloss Level 5), MPI #9.

C. Wood Substrates: Including wood trim and wood siding.

1. Latex System:

a. Prime Coat: Primer, latex for exterior wood, MPI #6.
b. Intermediate Coat: Latex, exterior, matching topcoat.
c. Topcoat: Latex, exterior flat (Gloss Level 1), MPI #10.
d. Topcoat: Latex, exterior, low sheen (Gloss Level 3-4), MPI #15.
e. Topcoat: Latex, exterior semi-gloss (Gloss Level 5), MPI #11.
f. Topcoat: Latex, exterior gloss (Gloss Level 6), MPI #119.

2. Latex over Alkyd Primer System:

a. Prime Coat: Primer, alkyd for exterior wood, MPI #5.
b. Prime Coat: Primer, oil for exterior woo[, MPI #7.
c. Intermediate Coat: Latex, exterior, matching topcoat.
d. Topcoat: Latex, exterior flat (Gloss Level 1), MPI #10.
e. Topcoat: Latex, exterior, low sheen (Gloss Level 3-4), MPI #15.
f. Topcoat: Latex, exterior semi-gloss (Gloss Level 5), MPI #11.
g. Topcoat: Latex, exterior gloss (Gloss Level 6), MPI #119.

3. Alkyd System:

a. Prime Coat: Primer, alkyd for exterior wood, MPI #5.
b. Prime Coat: Primer, oil for exterior wood, MPI #7.
c. Intermediate Coat: Exterior alkyd enamel matching topcoat.
d. Topcoat: Alkyd, exterior, flat (Gloss Level 5), MPI #8.
e. Topcoat: Alkyd, exterior, semi-gloss (Gloss Level 5), MPI #94.
f. Topcoat: Alkyd, exterior, gloss (Gloss Level 5), MPI #9.

D. Portland Cement Plaster Substrates:

1. Latex System:

a. Prime Coat: Latex, exterior, matching topcoat.
b. Intermediate Coat: Latex, exterior, matching topcoat.
c. Topcoat: Latex, exterior flat (Gloss Level 1), MPI #10.
d. Topcoat: Latex, exterior, low sheen (Gloss Level 3-4), MPI #15.

e. Topcoat: Latex, exterior semi-gloss (Gloss Level 5), MPI #11.
f. Topcoat: Latex, exterior gloss (Gloss Level 6), MPI #119.

2. Latex over Alkali-Resistant Primer System:

a. Prime Coat: Primer, alkali resistant, water based, MPI #3.
b. Intermediate Coat: Latex, exterior, matching topcoat.
c. Topcoat: Latex, exterior flat (Gloss Level 1), MPI #10.
d. Topcoat: Latex, exterior, low sheen (Gloss Level 3-4), MPI #15.
e. Topcoat: Latex, exterior semi-gloss (Gloss Level 5), MPI #11.
f. Topcoat: Latex, exterior gloss (Gloss Level 6), MPI #119.

3. High-Build Latex System: Dry film thickness not less than 10 mils (0.25 mm).

a. Prime Coat: As recommended in writing by topcoat manufacturer.
b. Intermediate Coat: As recommended in writing by topcoat manufacturer.
c. Topcoat: Latex, exterior, high build, MPI #40.

END OF SECTION 099113

SECTION 099123 - INTERIOR PAINTING

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 surface preparation and the application of paint systems on the following interior substrates:
   1. Wood.
   2. Gypsum board.

1.3 DEFINITIONS

A. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.

B. Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

C. Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

D. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.

E. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.

F. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.

G. Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

B. Samples for Initial Selection: For each type of topcoat product.

C. Samples for Verification: For each type of paint system and in each color and gloss of topcoat.

   1. Submit Samples on rigid backing, 8 inches (200 mm) square.

2. Step coats on Samples to show each coat required for system.
3. Label each coat of each Sample.
4. Label each Sample for location and application area.

D. Product List: For each product indicated, include the following:

1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
2. Printout of current "MPI Approved Products List" for each product category specified in Part 2, with the proposed product highlighted.
3. VOC content.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Paint: 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.7 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).

B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Benjamin Moore & Co.
2. Dunn-Edwards Corporation.
3. Kelly-Moore Paints.
4. Sherwin-Williams Company (The).

B. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 articles for the paint category indicated.

2.2 PAINT, GENERAL

A. MPI Standards: Provide products that comply with MPI standards indicated and that are listed in its "MPI Approved Products List."

B. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

C. VOC Content: Products shall comply with VOC limits of authorities having jurisdiction and, for interior paints and coatings applied at Project site, the following VOC limits, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

1. Flat Paints and Coatings: 50 g/L.
2. Nonflat Paints and Coatings: 150 g/L.
3. Dry-Fog Coatings: 400 g/L.
4. Primers, Sealers, and Undercoaters: 200 g/L.
5. Anticorrosive and Antirust Paints Applied to Ferrous Metals: 250 g/L.
6. Zinc-Rich Industrial Maintenance Primers: 340 g/L.
7. Pretreatment Wash Primers: 420 g/L.
8. Floor Coatings: 100 g/L.
9. Shellacs, Clear: 730 g/L.
10. Shellacs, Pigmented: 550 g/L.

D. Low-Emitting Materials: Interior paints and coatings shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

E. Colors: As selected by Architect from manufacturer's full range.

2.3 PRIMERS/SEALERS

A. Primer Sealer, Latex, Interior: MPI #50.

B. Primer, Alkali Resistant, Water Based: MPI #3.

C. Primer Sealer, Interior, Institutional Low Odor/VOC: MPI #149.

D. Primer, Latex, for Interior Wood: MPI #39.

E. Primer Sealer, Alkyd, Interior: MPI #45.

F. Primer, Bonding, Water Based: MPI #17.

G. Primer, Bonding, Solvent Based: MPI #69.

H. Wood-Knot Sealer: Sealer recommended in writing by topcoat manufacturer for use in paint systems indicated.

2.4 WATER-BASED PAINTS

A. Latex, Interior, Flat, (Gloss Level 1): MPI #53.

B. Latex, Interior, (Gloss Level 2): MPI #44.

C. Latex, Interior, (Gloss Level 3): MPI #52.

D. Latex, Interior, (Gloss Level 4): MPI #43.

E. Latex, Interior, Semi-Gloss, (Gloss Level 5): MPI #54.

F. Latex, Interior, Gloss, (Gloss Level 6, except minimum gloss of 65 units at 60 degrees): MPI #114.

G. Latex, Interior, Institutional Low Odor/VOC, Flat (Gloss Level 1): MPI #143.

H. Latex, Interior, Institutional Low Odor/VOC, (Gloss Level 2): MPI #144.

I. Latex, Interior, Institutional Low Odor/VOC, (Gloss Level 3): MPI #145.

J. Latex, Interior, Institutional Low Odor/VOC, Semi-Gloss (Gloss Level 5): MPI #147.

K. Latex, Interior, High Performance Architectural, (Gloss Level 2): MPI #138.

L. Latex, Interior, High Performance Architectural, (Gloss Level 3): MPI #139.

M. Latex, Interior, High Performance Architectural, (Gloss Level 4): MPI #140

N. Latex, Interior, High Performance Architectural, Semi-Gloss (Gloss Level 5): MPI #141.

O. Light Industrial Coating, Interior, Water Based (Gloss Level 3): MPI #151.

P. Light Industrial Coating, Interior, Water Based, Semi-Gloss (Gloss Level 5): MPI #153.

Q. Light Industrial Coating, Interior, Water Based, Gloss (Gloss Level 6): MPI #154.

2.5 SOLVENT-BASED PAINTS

A. Alkyd, Interior, Flat (Gloss Level 1): MPI #49.

B. Alkyd, Interior, (Gloss Level 3): MPI #51.

C. Alkyd, Interior, Semi-Gloss (Gloss Level 5): MPI #47.

D. Alkyd, Interior, Gloss (Gloss Level 6): MPI #48.

E. Alkyd, Quick Dry, Semi-Gloss (Gloss Level 5): MPI #81.

F. Alkyd, Quick Dry, Gloss (Gloss Level 7): MPI #96.

2.6 SOURCE QUALITY CONTROL

A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:

1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
2. Testing agency will perform tests for compliance with product requirements.
3. Owner may direct Contractor to stop applying coatings if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Wood: 15 percent.
2. Gypsum Board: 12 percent.

C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.

D. Plaster Substrates: Verify that plaster is fully cured.

E. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

F. Proceed with coating application only after unsatisfactory conditions have been corrected.

1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

D. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

E. Aluminum Substrates: Remove loose surface oxidation.

F. Wood Substrates:

1. Scrape and clean knots, and apply coat of knot sealer before applying primer.
2. Sand surfaces that will be exposed to view, and dust off.
3. Prime edges, ends, faces, undersides, and backsides of wood.
4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."

1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

E. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:

1. Paint the following work where exposed in equipment rooms:

a. Equipment, including panelboards and switch gear.
b. Uninsulated metal piping.
c. Uninsulated plastic piping.
d. Pipe hangers and supports.
e. Metal conduit.
f. Plastic conduit.
g. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.

2. Paint the following work where exposed in occupied spaces:

a. Equipment, including panelboards.
b. Uninsulated metal piping.
c. Uninsulated plastic piping.
d. Pipe hangers and supports.
e. Metal conduit.
f. Plastic conduit.
g. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
h. Other items as directed by Architect.

3. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.

3.4 FIELD QUALITY CONTROL

A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.

1. Contractor shall touch up and restore painted surfaces damaged by testing.
2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 INTERIOR PAINTING SCHEDULE

A. Wood Substrates: Including wood trim and wood-based panel products.

1. Latex System:

   a. Prime Coat: Primer, latex, for interior wood, MPI #39.
   b. Intermediate Coat: Latex, interior, matching topcoat.
   c. Topcoat: Latex, interior, flat, (Gloss Level 1), MPI #53.
   d. Topcoat: Latex, interior, (Gloss Level 2), MPI #44.
   e. Topcoat: Latex, interior, (Gloss Level 3), MPI #52.
   f. Topcoat: Latex, interior, (Gloss Level 4), MPI #43.
   g. Topcoat: Latex, interior, semi-gloss, (Gloss Level 5), MPI #54.
   h. Topcoat: Latex, interior, gloss, (Gloss Level 6, except minimum gloss of 65 units at 60 degrees), MPI #114.

2. Latex over Alkyd Primer System:

   a. Prime Coat: Primer sealer, alkyd, interior, MPI #45.
   b. Intermediate Coat: Latex, interior, matching topcoat.
   c. Topcoat: Latex, interior, flat, (Gloss Level 1), MPI #53.
   d. Topcoat: Latex, interior, (Gloss Level 2), MPI #44.
   e. Topcoat: Latex, interior, (Gloss Level 3), MPI #52.
   f. Topcoat: Latex, interior, (Gloss Level 4), MPI #43.
   g. Topcoat: Latex, interior, semi-gloss, (Gloss Level 5), MPI #54.
   h. Topcoat: Latex, interior, gloss, (Gloss Level 6, except minimum gloss of 65 units at 60 degrees), MPI #114.

3. Institutional Low-Odor/VOC Latex System:

   a. Prime Coat: Primer, latex, for interior wood, MPI #39.
   b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
   c. Topcoat: Latex, interior, institutional low odor/VOC, flat (Gloss Level 1), MPI #143.
   d. Topcoat: Latex, interior, institutional low odor/VOC, (Gloss Level 2), MPI #144.

e. Topcoat: Latex, interior, institutional low odor/VOC, (Gloss Level 3), MPI #145.
f. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss (Gloss Level 5), MPI #147.

4. Alkyd System:

a. Prime Coat: Primer sealer, alkyd, interior, MPI #45.
b. Intermediate Coat: Alkyd, interior, matching topcoat.
c. Topcoat: Alkyd, interior, flat (Gloss Level 1), MPI #49.
d. Topcoat: Alkyd, interior, (Gloss Level 3), MPI #51.
e. Topcoat: Alkyd, interior, semi-gloss (Gloss Level 5), MPI #47.
f. Topcoat: Alkyd, interior, gloss (Gloss Level 6), MPI #48.

B. Gypsum Board and Plaster Substrates:

1. Latex System:

a. Prime Coat: Primer sealer, latex, interior, MPI #50.
b. Prime Coat: Latex, interior, matching topcoat.
c. Intermediate Coat: Latex, interior, matching topcoat.
d. Topcoat: Latex, interior, flat, (Gloss Level 1), MPI #53.
e. Topcoat: Latex, interior, (Gloss Level 2), MPI #44.
f. Topcoat: Latex, interior, (Gloss Level 3), MPI #52.
g. Topcoat: Latex, interior, (Gloss Level 4), MPI #43.
h. Topcoat: Latex, interior, semi-gloss, (Gloss Level 5), MPI #54.
i. Topcoat: Latex, interior, gloss, (Gloss Level 6, except minimum gloss of 65 units at 60 degrees), MPI #114.

2. Institutional Low-Odor/VOC Latex System:

a. Prime Coat: Primer sealer, interior, institutional low odor/VOC, MPI #149.
b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
c. Topcoat: Latex, interior, institutional low odor/VOC, flat (Gloss Level 1), MPI #143.
d. Topcoat: Latex, interior, institutional low odor/VOC, (Gloss Level 2), MPI #144.
e. Topcoat: Latex, interior, institutional low odor/VOC, (Gloss Level 3), MPI #145.
f. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss (Gloss Level 5), MPI #147.

3. Water-Based Light Industrial Coating System:

a. Prime Coat: Primer sealer, latex, interior, MPI #50.
b. Intermediate Coat: Light industrial coating, interior, water based, matching topcoat.
c. Topcoat: Light industrial coating, interior, water based (Gloss Level 3), MPI #151.
d. Topcoat: Light industrial coating, interior, water based, semi-gloss (Gloss Level 5), MPI #153.
e. Topcoat: Light industrial coating, interior, water based, gloss (Gloss Level 6), MPI #154.

4. Alkyd over Latex Primer System:

    a. Prime Coat: Primer sealer, latex, interior, MPI #50.
    b. Intermediate Coat: Alkyd, interior, matching topcoat.
    c. Topcoat: Alkyd, interior, flat (Gloss Level 1), MPI #49.
    d. Topcoat: Alkyd, interior, (Gloss Level 3), MPI #51.
    e. Topcoat: Alkyd, interior, semi-gloss (Gloss Level 5), MPI #47.
    f. Topcoat: Alkyd, interior, gloss (Gloss Level 6), MPI #48.

END OF SECTION 099123

SECTION 101423 - PANEL SIGNAGE

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. Panel signs.
2. Room-identification signs.
3. Field-applied, vinyl-character signs.

1.3 DEFINITIONS

A. Accessible: In accordance with the accessibility standard.

1.4 COORDINATION

A. Furnish templates for placement of sign-anchorage devices embedded in permanent construction by other installers.

B. Furnish templates for placement of electrical service embedded in permanent construction by other installers.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For panel signs.

1. Include fabrication and installation details and attachments to other work.
2. Show sign mounting heights, locations of supplementary supports to be provided by others, and accessories.
3. Show message list, typestyles, graphic elements, including raised characters and Braille, and layout for each sign at least half size.
4. Show locations of electrical service connections.
5. Include diagrams for power, signal, and control wiring.

C. Samples for Initial Selection: For each type of sign assembly, exposed component, and exposed finish.

1. Include representative Samples of available typestyles and graphic symbols.

D. Samples for Verification: For each type of sign assembly showing all components and with the required finish(es), in manufacturer's standard size unless otherwise indicated and as follows:

1. Panel Signs: Full-size Sample.
2. Room-Identification Signs: Full-size Sample.

E. Sign Schedule: Use same designations specified or indicated on Drawings or in a sign schedule.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer and manufacturer.

B. Sample Warranty: For special warranty.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For signs to include in maintenance manuals.

1.8 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer of products. An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.9 FIELD CONDITIONS

A. Field Measurements: Verify locations of anchorage devices and electrical service embedded in permanent construction by other installers by field measurements before fabrication, and indicate measurements on Shop Drawings.

1.10 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Deterioration of finishes beyond normal weathering.
b. Deterioration of embedded graphic image.
c. Separation or delamination of sheet materials and components.

2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PANEL SIGNS, GENERAL

A. Regional Materials: Panel signs shall be manufactured within 500 miles of Project site.

2.2 PERFORMANCE REQUIREMENTS

A. Thermal Movements: For exterior signs, allow for thermal movements from ambient and surface temperature changes.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

B. Accessibility Standard: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities for signs.

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.

2.3 SIGNS

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:

B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated or comparable product by one of the following:

1. Ace Sign Systems, Inc.
2. Advance Corporation; Braille-Tac Division.
3. Allen Industries, Inc.
4. Allen Markings International.
5. APCO Graphics, Inc.
6. ASE, Inc.
7. ASI Sign Systems, Inc.
8. Best Sign Systems Inc.
9. Bunting Graphics, Inc.
10. Clarke Systems.
11. Diskey Sign Company.
12. Fossil Industries, Inc.
13. InPro Corporation.
14. Mohawk Sign Systems.
15. Nelson-Harkins Industries.
16. Poblocki Sign Company, LLC.
17. Seton Identification Products.
18. Supersine Company (The); Division of Stamp-Rite, Inc.
19. Vista System.
20. Vomar Products, Inc.

C. Panel Sign: Sign with smooth, uniform surfaces; with message and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:

1. Basis-of-Design Product: Indicated on Drawings.

2. Solid-Sheet Sign: Acrylic, Fiberglass, PVC sheet with finish specified in "Surface Finish and Applied Graphics" Subparagraph below and as follows:

   a. Thickness: Manufacturer's standard for size of sign 0.060 inch (1.52 mm).
   b. Surface-Applied Graphics: Applied vinyl film.
   c. Etched and Filled Graphics: Sign face etched or routed to receive enamel-paint infill.

3. Laminated-Sheet Sign: Photopolymer face sheet with raised graphics laminated over subsurface graphics to acrylic backing sheet to produce composite sheet.

   a. Composite-Sheet Thickness: Manufacturer's standard for size of sign 0.125 inch (3.18 mm).
   b. Surface-Applied Graphics: Applied vinyl film.

4. Mounting: Manufacturer's standard method for substrates indicates with concealed anchors, countersunk flathead through fasteners or adhesive.

5. Text and Typeface: Accessible raised characters and Braille, Times Roman, typeface as indicated by manufacturer's designation. Finish raised characters to contrast with background color, and finish Braille to match background color.

D. Room-Identification Sign: Sign with smooth, uniform surfaces; with message and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:

1. Basis-of-Design Product: Indicated on Drawings.
2. Laminated-Sheet Sign: Photopolymer face sheet with raised graphics laminated over subsurface graphics to acrylic backing sheet to produce composite sheet.

   a. Composite-Sheet Thickness: Manufacturer's standard for size of sign 0.125 inch (3.18 mm).
   b. Surface-Applied Graphics: Applied vinyl film.
   c. Color(s): As selected by Architect from manufacturer's full range.

3. Sign-Panel Perimeter: Finish edges smooth.

4. Mounting: Manufacturer's standard method for substrates indicated, Surface mounted to wall with concealed anchors, countersunk flathead through fasteners or adhesive.

5. Text and Typeface: Accessible raised characters and Braille, Times Roman, typeface as indicated by manufacturer's designation, typeface as selected by Architect from manufacturer's full range. Finish raised characters to contrast with background color, and finish Braille to match background color.

2.4 PANEL-SIGN MATERIALS

A. Aluminum Sheet and Plate: ASTM B 209 (ASTM B 209M), alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.

B. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.

C. Steel Materials:

1. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coating, either commercial or forming steel.
2. Steel Sheet: Uncoated, cold-rolled, ASTM A 1008/A 1008M, commercial steel, Type B, exposed or electrolytic zinc-coated, ASTM A 879/A 879M, Coating Designation 08Z (24G), with steel-sheet substrate according to ASTM A 1008/A 1008M, commercial steel, exposed.
3. Steel Members Fabricated from Plate or Bar Stock: ASTM A 529/A 529M or ASTM A 572/A 572M, 42,000-psi (290-MPa) minimum yield strength.
4. For steel exposed to view on completion, provide materials having flat, smooth surfaces without blemishes. Do not use materials whose surfaces exhibit pitting, seam marks, roller marks, rolled trade names, or roughness.

D. Acrylic Sheet: ASTM D 4802, category as standard with manufacturer for each sign, Type UVF (UV filtering).

E. Polycarbonate Sheet: ASTM C 1349, Appendix X1, Type II (coated, mar-resistant, UV-stabilized polycarbonate), with coating on both sides.

F. Fiberglass Sheet: Multiple laminations of glass-fiber-reinforced polyester resin with UV-light stable, colorfast, nonfading, weather- and stain-resistant, colored polyester gel coat, and with manufacturer's standard finish.

G. PVC Sheet: Manufacturer's standard, UV-light stable, PVC plastic.

H. Plastic-Laminate Sheet: NEMA LD 3, general-purpose HGS grade, 0.048-inch (1.2-mm) nominal thickness.

I. Vinyl Film: UV-resistant vinyl film of nominal thickness indicated, with pressure-sensitive, permanent adhesive on back; die cut to form characters or images as indicated and suitable for exterior applications.

J. Paints and Coatings for Sheet Materials: Inks, dyes, and paints that are recommended by manufacturer for optimum adherence to surface and are UV and water resistant for colors and exposure indicated.

2.5 ACCESSORIES

A. Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of signage, noncorrosive and compatible with each material joined, and complying with the following:

1. Use concealed fasteners and anchors unless indicated to be exposed.
2. For exterior exposure, furnish nonferrous-metal, stainless-steel or hot-dip galvanized devices unless otherwise indicated.
3. Exposed Metal-Fastener Components, General:

    a. Fabricated from same basic metal and finish of fastened metal unless otherwise indicated.
    b. Fastener Heads: For nonstructural connections, use flathead screws and bolts with tamper-resistant Allen-head slots unless otherwise indicated.

4. Sign Mounting Fasteners:

    a. Concealed Studs: Concealed (blind), threaded studs welded or brazed to back of sign material or screwed into back of sign assembly, unless otherwise indicated.
    b. Projecting Studs: Threaded studs with sleeve spacer, welded or brazed to back of sign material or screwed into back of sign assembly, unless otherwise indicated.
    c. Through Fasteners: Exposed metal fasteners matching sign finish, with type of head indicated, installed in predrilled holes.

5. Inserts: Furnish inserts to be set by other trades into concrete or masonry work.

B. Adhesives: As recommended by sign manufacturer and with a VOC content of 70 g/L or less for adhesives used inside the weatherproofing system and applied on-site when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

C. Adhesives: As recommended by sign manufacturer and that comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

2.6 FABRICATION

A. General: Provide manufacturer's standard sign assemblies according to requirements indicated.

1. Preassemble signs and assemblies in the shop to greatest extent possible. Disassemble signs and assemblies only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation; apply markings in locations concealed from view after final assembly.
2. Mill joints to a tight, hairline fit. Form assemblies and joints exposed to weather to resist water penetration and retention.
3. Comply with AWS for recommended practices in welding and brazing. Provide welds and brazes behind finished surfaces without distorting or discoloring exposed side. Clean exposed welded and brazed connections of flux, and dress exposed and contact surfaces.
4. Conceal connections if possible; otherwise, locate connections where they are inconspicuous.
5. Internally brace signs for stability and for securing fasteners.

6. Provide rebates, lugs, and brackets necessary to assemble components and to attach to existing work. Drill and tap for required fasteners. Use concealed fasteners where possible; use exposed fasteners that match sign finish.

B. Surface-Engraved Graphics: Machine engrave characters and other graphic devices into panel surface indicated to produce precisely formed copy, incised to uniform depth.

1. Engraved Metal: Fill engraved graphics with manufacturer's standard baked enamel.
2. Engraved Opaque Acrylic Sheet: Fill engraved graphics with manufacturer's standard enamel.
3. Engraved Plastic Laminate: Engrave through exposed face ply of plastic-laminate sheet to expose contrasting core ply.

C. Brackets: Fabricate brackets, fittings, and hardware for bracket-mounted signs to suit sign construction and mounting conditions indicated. Modify manufacturer's standard brackets as required.

1. Aluminum Brackets: Factory finish brackets with baked-enamel or powder-coat finish to match sign-background color unless otherwise indicated.

2.7 GENERAL FINISH REQUIREMENTS

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Directional Finishes: Run grain with long dimension of each piece and perpendicular to long dimension of finished trim or border surface unless otherwise indicated.

D. Organic, Anodic, and Chemically Produced Finishes: Apply to formed metal after fabrication but before applying contrasting polished finishes on raised features unless otherwise indicated.

2.8 METALLIC-COATED STEEL FINISHES

A. Surface Preparation: Clean surfaces of oil and other contaminants. Use cleaning methods that do not leave residue. After cleaning, apply a conversion coating compatible with the organic coating to be applied over it. Clean welds, mechanical connections, and abraded areas and apply galvanizing repair paint, complying with SSPC-Paint 20, to comply with ASTM A 780/A 780M.

B. Factory Prime Finish: After cleaning and pretreating, apply an air-dried primer compatible with the organic coating to be applied over it.

C. Baked-Enamel or Powder-Coat Finish: After cleaning and pretreating, apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat to a minimum dry film thickness of 2 mils (0.05 mm).

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of signage work.

B. Verify that sign-support surfaces are within tolerances to accommodate signs without gaps or irregularities between backs of signs and support surfaces unless otherwise indicated.

C. Verify that anchor inserts are correctly sized and located to accommodate signs.

D. Verify that electrical service is correctly sized and located to accommodate signs.

E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Install signs using mounting methods indicated and according to manufacturer's written instructions.

1. Install signs level, plumb, true to line, and at locations and heights indicated, with sign surfaces free of distortion and other defects in appearance.
2. Install signs so they do not protrude or obstruct according to the accessibility standard.
3. Before installation, verify that sign surfaces are clean and free of materials or debris that would impair installation.
4. Corrosion Protection: Coat concealed surfaces of exterior aluminum in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.

B. Room-Identification Signs and Other Accessible Signage: Install in locations on walls as indicated and according to accessibility standard.

C. Mounting Methods:

1. Concealed Studs: Using a template, drill holes in substrate aligning with studs on back of sign. Remove loose debris from hole and substrate surface.
   a. Thin or Hollow Surfaces: Place sign in position and flush to surface, install washers and nuts on studs projecting through opposite side of surface, and tighten.

2. Projecting Studs: Using a template, drill holes in substrate aligning with studs on back of sign. Remove loose debris from hole and substrate surface.
   a. Thin or Hollow Surfaces: Place spacers on studs, place sign in position with spacers pinched between sign and substrate, and install washers and nuts on stud ends projecting through opposite side of surface, and tighten.

3. Through Fasteners: Drill holes in substrate using predrilled holes in sign as template. Countersink holes in sign if required. Place sign in position and flush to surface. Install through fasteners and tighten.

4. Brackets: Remove loose debris from substrate surface and install backbar or bracket supports in position so that signage is correctly located and aligned.
5. Adhesive: Clean bond-breaking materials from substrate surface and remove loose debris. Apply linear beads or spots of adhesive symmetrically to back of sign and of suitable quantity to support weight of sign after cure without slippage. Keep adhesive away from edges to prevent adhesive extrusion as sign is applied and to prevent visibility of cured adhesive at sign edges. Place sign in position, and push to engage adhesive. Temporarily support sign in position until adhesive fully sets.
6. Shim-Plate Mounting: Provide 1/8-inch- (3-mm-) thick, concealed aluminum shim plates with predrilled and countersunk holes, at locations indicated, and where other direct mounting methods are impractical. Attach plate with fasteners and anchors suitable for secure attachment to substrate. Attach signs to plate using method specified above.

3.3 ADJUSTING AND CLEANING

A. Remove and replace damaged or deformed signs and signs that do not comply with specified requirements. Replace signs with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.

B. Remove temporary protective coverings and strippable films as signs are installed.

C. On completion of installation, clean exposed surfaces of signs according to manufacturer's written instructions, and touch up minor nicks and abrasions in finish. Maintain signs in a clean condition during construction and protect from damage until acceptance by Owner.

END OF SECTION 101423

SECTION 102800 - TOILET, BATH, AND LAUNDRY ACCESSORIES

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. Public-use washroom accessories.
2. Underlavatory guards.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include the following:

1. Construction details and dimensions.
2. Anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
3. Material and finish descriptions.
4. Features that will be included for Project.
5. Manufacturer's warranty.

B. Samples: Full size, for each accessory item to verify design, operation, and finish requirements.

1. Approved full-size Samples will be returned and may be used in the Work.

C. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.

1. Identify locations using room designations indicated.
2. Identify products using designations indicated.

1.4 INFORMATIONAL SUBMITTALS

A. Warranty: Sample of special warranty.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For toilet and bath accessories to include in maintenance manuals.

1.6 QUALITY ASSURANCE

A. Source Limitations: For products listed together in the same Part 2 articles, obtain products from single source from single manufacturer.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

1.7 COORDINATION

A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.

B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Stainless Steel: ASTM A 666, Type 304, 0.031-inch (0.8-mm) minimum nominal thickness unless otherwise indicated.

B. Steel Sheet: ASTM A 1008/A 1008M, Designation CS (cold rolled, commercial steel), 0.036-inch (0.9-mm) minimum nominal thickness.

C. Galvanized-Steel Sheet: ASTM A 653/A 653M, with G60 (Z180) hot-dip zinc coating.

D. Galvanized-Steel Mounting Devices: ASTM A 153/A 153M, hot-dip galvanized after fabrication.

E. Fasteners: Screws, bolts, and other devices of same material as accessory unit and tamper-and-theft resistant where exposed, and of galvanized steel where concealed.

F. Chrome Plating: ASTM B 456, Service Condition Number SC 2 (moderate service).

G. ABS Plastic: Acrylonitrile-butadiene-styrene resin formulation.

2.2 PUBLIC-USE WASHROOM ACCESSORIES

A. See Editing Instruction No. 1 in the Evaluations for cautions about naming manufacturers. Retain one of first two paragraphs and list of manufacturers below. See Section 016000 "Product Requirements."

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:

C. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

1. A & J Washroom Accessories, Inc.
2. American Specialties, Inc.
3. Bobrick Washroom Equipment, Inc.
4. Bradley Corporation.
5. GAMCO Specialty Accessories; a division of Bobrick Washroom Equipment, Inc.
6. Tubular Specialties Manufacturing, Inc.

D. Combination Toilet Tissue Dispenser:

1. Basis-of-Design Product: Bobrick.
2. Description: Combination unit with double-roll toilet tissue dispenser and the following:
    a. Removable sanitary-napkin waste receptacle with self-closing, disposal-opening cover.
    b. Seat-cover dispenser with minimum capacity of 500 single or half-fold seat covers.
3. Mounting: Recessed.
4. Toilet Tissue Dispenser Capacity: 4-1/2- or 5-inch- (114- or 127-mm-) diameter tissue rolls.
5. Toilet Tissue Dispenser Operation: Noncontrol delivery with theft-resistant spindles.
6. Material and Finish: Stainless steel, No. 4 finish (satin).
7. Lockset: Tumbler type.

E. Liquid-Soap Dispenser:

1. Basis-of-Design Product: Purell ES8
2. Description: Designed for dispensing soap in liquid form.
3. Mounting: Vertically oriented, surface mounted.
4. Lockset: Tumbler type.
5. Refill Indicator: Window type.

F. Grab Bar:

1. Basis-of-Design Product: Bobrick.
2. Mounting: Flanges with concealed fasteners.
3. Material: Stainless steel, 0.05 inch (1.3 mm) thick.
    a. Finish: Smooth, No. 4 finish (satin).

4. Outside Diameter: 1-1/2 inches (38 mm).
5. Configuration and Length: As indicated on Drawings.

G. Sanitary-Napkin Vendor Unit:

1. Basis-of-Design Product: Bobrick.
2. Mounting: Surface mounted.
3. Door or Cover: Self-closing, disposal-opening cover and hinged face panel with tumbler lockset.
4. Receptacle: Removable.
5. Material and Finish: Stainless steel, No. 4 finish (satin).

2.3 FABRICATION

A. General: Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.

B. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of **six** keys to Owner's representative.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.

B. Grab Bars: Install to withstand a downward load of at least 250 lbf (1112 N), when tested according to ASTM F 446.

3.2 ADJUSTING AND CLEANING

A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.

B. Remove temporary labels and protective coatings.

C. Clean and polish exposed surfaces according to manufacturer's written recommendations.

END OF SECTION 102800

SECTION 22 00 00

PLUMBING GENERAL REQUIREMENTS

PART 1 – GENERAL

1.1 CONDITIONS AND REQUIREMENTS

A. Refer to the General Conditions, Supplementary Conditions, and Division 01 General Requirements.

1.2 SCOPE OF WORK

A. Provide all labor, apparatus, and materials that are required to provide a complete installation as indicated on the drawings and in the specifications, including that reasonably inferred for proper execution of this Division.

B. Consult all other Sections to determine the extent of this work specified elsewhere.

C. Coordinate all utility requirements for equipment furnished under this Division. Rough-in required systems and make final connections.

1.3 REGULATIONS AND STANDARDS

A. Install all work to meet or exceed requirements prescribed by governmental bodies having jurisdiction and in accordance with all federal, state, and local codes and ordinances, and all OSHA requirements. These codes include, but are not limited to the latest applicable edition of the following:

1. California Building Code
2. California Electrical Code
3. California Plumbing Code
4. California Mechanical Code
5. California Energy Code
6. California Green Buildings Standard
7. California Fire Code
8. National Fire Protection Association

1.4 QUALITY ASSURANCE

A. Comply with current governing codes, ordinance and regulations of the Authority Having Jurisdiction and the regulations and requirements of the Owner’s insurance underwriter.

B. Where requirements differ between drawings, specifications, codes and standards, apply the more stringent.

C. Should any change in drawings or specifications be required to comply with governing regulations, notify the Architect prior to submitting bid.

D. After contract is awarded, if minor changes or additions are required by the aforementioned authorities, even though such work is not shown on drawings or overtly covered in the specifications, they shall be included at the Contractor's expense.

E. Execute work in strict accordance with the best practices of the trades in a thorough, substantial, skillful and well-executed manner by competent workers. Provide a competent, experienced full-time Superintendent who is authorized to make decisions on behalf of the Contractor.

F. The Architect or Architect's Representative may conduct unannounced field reviews of any work completed or in progress. A report will be issued for all items that are found to be inconsistent with the contract documents. All items in the report shall be addressed in writing by the Contractor within two (2) weeks.

1.5 SAFETY

A. Contractors must conduct a weekly safety meeting with their employees and maintain documentation of attendance and topics of discussion. Contractor shall comply with all OSHA regulations. Contractor is required to obtain and pay for insurance required to cover all activities withing Contractor's scope of work.

1.6 PERMITS, FEES, AND UTILITIES

A. Secure and pay for all permits, licenses, inspections, and fees required.

B. Coordinate with other Sections and schedule sequence of accomplishing the work in such a manner as not to interrupt existing services and utilities at a time that will inconvenience the Owner. Provide Owner a minimum 48 hour notice when utilities will be interrupted.

1.7 PAINTING

A. Paint all exposed piping and supports.

B. See Division 09 for painting.

1.8 COORDINATION

A. Coordinate with work performed by other Sections in order to ensure adequate space and proper location of all necessary work on this project whether or not work is under this Section. Coordination shall be done prior to order or manufacture of any systems or components.

B. At a minimum, coordinate location of each piece of equipment, requirements for access panels, space required for supports, power requirements for each piece of equipment, and control requirements for each piece of equipment.

C. Coordination meetings shall happen within the first two weeks of construction start. Coordination meeting minutes shall be submitted to the Architect for review.

D. Prepare complete set of construction coordination shop drawings indicating equipment actually purchased and exact routing of all piping and ductwork. Requirement for coordination shop drawings shall not be construed as authorization for contractor to make unauthorized changes to Contract Documents. Prior to final acceptance, contractor shall submit the coordination shop drawings as part of the record drawings.

E. Wherever the work is of sufficient complexity, prepare additional detail drawings to scale to coordinate the work with the work of other trades. At completion, include a set of these drawings with the record drawings.

F. Install the work in cooperation with other trades. Before installation, make proper provisions to avoid interferences.

G. Pipes which pitch have right-of-way over those which do not pitch. For example, condensate drains and waste normally have right-of-way.

H. No additional costs will be considered for work which has to be relocated due to conflicts with other trades or for additional equipment/parts that need to be installed due to a lack of coordination prior to, or during, construction.

PART 2 – PRODUCTS

2.1 EQUIPMENT AND MATERIALS

A. Provide products and materials that are new, clean, free of defects, damage and corrosion. Inspect all materials and remove defective materials from the site.

B. Provide materials and equipment bearing the label of, or listed by, the Underwriter's Laboratories (UL), unless the material or equipment is of a type for which label or listing service is not provided.

C. Furnish all materials and equipment of the same type by the same manufacturer.

2.2 ALTERNATE EQUIPMENT AND MATERIALS

A. No substitute materials or equipment may be installed without the written approval of the Architect.

B. Contract documents are based on materials specified and equipment manufacturers indicated. Acceptance of alternative equipment manufacturers does not relieve Contractor of the responsibility to provide equipment and materials which meet the quality and performance stated or implied in the contract documents.

C. All submittals for substitution must include comparison to show equal with scheduled equipment. Submit proposals to supply alternate materials or equipment, in writing, with sufficient lead time for review prior to the date equipment must be ordered to maintain project schedule.

D. No increase in the contract price will be considered to accommodate the use of alternative equipment, including revisions required by other trades.

2.3 SUBMITTALS

A. Submit shop drawings, manufacturer's data, samples and test reports as specified.

B. The review of submittals is for general compliance with the design concept and contract documents. Comments or absence of comments does not relieve the Contractor/Vendor/Manufacturer from compliance with the contract documents. The Contractor remains solely responsible for details and accuracy, for confirming and correlating all quantities and dimensions, for selecting fabrication processes, for techniques of construction, for performing the work in a safe manner, and for coordinating the work with that of other trades.

C. No part of the work shall be ordered, procured, or installed until that work has been submitted, reviewed, and returned without comment.

D. Items indicated in submittal comments shall be provided and installed by contractor.

E. The Engineer and/or Architect shall review the submitted documents for general conformance with the design concept of the project. The review does not relieve the Contractor of the responsibility of deviations from the requirements stated in the contract documents.

F. The Engineer's and/or Architect's review shall not be construed as a completed detailed check of the work submitted, nor shall it relieve the Manufacturer or Contractor of responsibility for errors or omissions of any sort or from the necessity of furnishing any work required by the contract documents.

G. Submittals are not reviewed for quantities, dimensions, weights, fabrication processes, construction methods, coordination with work of other trades, construction safety practices, service clearance, location of control and electrical panels, and other layout constraints. These items shall remain the sole responsibility of the Contractor.

H. A minimum period of ten (10) working days will be required in the Engineer's office each time a submittal is sent for review. Contractor shall prioritize submittal reviews where multiple submittals are sent for review. This time period must be considered by the Contractor in the scheduling of the work.

I. Submittals will be returned to indicate appropriate action taken as follows:

1. No Exceptions Taken.
2. Make Corrections Noted. No Resubmittal Required.
3. Revise and Resubmit.
4. Rejected.
5. Not Reviewed.

J. Use electronic form acceptable to Architect for electronic submittals, containing the following information:

1. Project name.
2. Date.
3. Name and address of Architect and Engineer.

4. Name of Owner.
5. Name, address and contact information of Contractor.
6. Names and contact information of sub-contractor, manufacturer, and supplier.
7. Name of entity that prepared submittal.
8. Category and type of submittal.
9. Specification Section number and title.
10. Drawing number and detail references, as appropriate.
11. Transmittal number, numbered consecutively, and revision number clearly identified.
12. Each item submitted labeled or identified the same as on the drawings.

K. Identify each sheet of submittal pages (using arrows, underlining or circling) to show applicable sizes, types, model numbers, ratings, capacities and options actually being proposed. Cross out non-applicable information.

L. Organize submittals to keep all related items together; break submittal into sections and provide appropriate identifying tags on submittal pages to indicate item being submitted.

M. Provide a bookmark for each submittal section. Include a table of contents at beginning of submittal.

N. Submit all items related to specification section in single submittal file. Partial submittals will be deemed incomplete and not reviewed.

O. Inadequate or incomplete submittals will not be reviewed and will be returned to the Contractor for resubmittal.

P. Place orders for all equipment in time to prevent any delay in construction schedule or completion of project. No additional costs will be considered for any special handling charges or expedited processing required for materials or equipment not ordered in time.

2.4 REQUEST FOR INFORMATION

A. While every effort has been made to coordinate the locations of equipment covered under other sections or divisions of these specifications, it is the responsibility of the Contractor to coordinate the exact requirements governed by actual job conditions. Check all information and report any discrepancies before submitting bid or fabricating work.

B. Report discrepancies in time to avoid unnecessary work, and make changes as directed by the Architect.

C. Do not make changes or additions that are subject to additional compensation without written authorization, based upon an agreed price. Any changes made without the above-mentioned authorization shall be at Contractor's own risk and expense.

D. Follow manufacturer’s instructions where they cover points not specifically indicated. However, if they are in conflicts with these drawings and specifications, obtain clarifications from the Architect before starting work.

E. All requests for information shall be accompanied with Contractor's proposed solution.

PART 3 – EXECUTION

3.1 EXAMINATION OF SITE

A. The Contract Documents do not make representations regarding the character or the extent of the subsoils, water levels, existing structural, mechanical, plumbing, and electrical installations, above or below grade, or other sub-surface conditions which may be encountered during the work.

B. Evaluate existing conditions that may affect methods or cost of performing the work, based on examination of the site or other information. Failure to examine the Drawings or other information does not relieve the Contractor of responsibility for satisfactory completion of the work.

3.2 DRAWINGS

A. Drawings show general arrangement and location of piping and equipment. Drawings are diagrammatic and intended to show approximate location and routing. Dimensions on drawings shall take precedence over scaled dimensions on drawings. Allow for supports, expansion, and pitch of piping. Field verify all dimensions.

B. The exact locations of equipment and piping shall be ascertained from the Architect or the Owner's representative in the field. The Architect reserves the right to make minor changes in the location of piping and equipment up to the time of installation without additional cost.

C. Furnish and install any incidental work not shown or specified which can reasonably be inferred as part of the work and necessary to provide a complete and workable system. This includes any wiring of sensors, switches, etc.

D. Execute any work or apparatus shown on the Drawings and not specifically mentioned in the Specifications, or vice versa. Omission from Drawings or Specifications of any minor details of construction, installation, materials, or essential specialties does not relieve Contractor from furnishing complete workable system.

3.3 RECORD DRAWINGS

A. Contractor shall maintain a complete set of documents on site that are marked up during the construction process indicating all changes that have been made. Record drawings shall be maintained up to date throughout construction. Indicate clearly all work installed differently from that shown.

B. Upon completion of work, certify all record drawings with a stamp including the date and name of Contractor. Submit one (1) complete, bookmarked, set of electronic record drawings to the Architect for final review.

C. Record drawings must include the following as a minimum:

1. Actual equipment locations.
2. Revisions or substitutions to equipment schedules.

3. Pipe size and routing.
4. Dimensional changes to drawings.
5. Revisions to details shown on drawings.
6. Changes made by RFIs, Addenda, or Change Orders.
7. Locations of access panels and shut-off valves.
8. Locations and depths of underground utilities.

3.4 PROTECTION OF BUILDING

A. Protect new and existing building structures and adjacent finished surfaces during construction. Patch, repair, and refinish existing work damaged by work under this Division to match adjacent undisturbed areas.

3.5 DELIVERY, DRAYAGE AND HAULING

A. Include all drayage, hauling, hoisting, shoring and placement in the building of equipment specified and be responsible for the timely delivery of equipment to the project as required by the construction schedule.

B. Provide proper protection and storage of all items and tools required.

C. If equipment is not delivered or installed at the project site in a timely manner as required by the construction schedule, the Contractor shall be responsible for disassembly, re-assembly, manufacturer's supervision, shoring, general construction modification, delays, overtime costs, etc. at no additional cost to the Owner.

3.6 EQUIPMENT AND MATERIAL PROTECTION

A. Protect the work, equipment, and material of other trades from damage by work or workers of this trade, and correct damage caused without additional cost to the Owner.

B. The Contractor shall be responsible for all work, materials, and equipment until finally inspected, tested, and accepted. Protect work against theft, injury, or damage. Carefully store material and equipment received on site that is not immediately installed.

C. Cover open ends of work with temporary covers or plugs during construction to prevent entry of dust, dirt, water or other obstructing material. Cover and protect equipment and materials from damage due to water, humidity, paint, spray-on fireproofing, construction debris, etc. Store equipment subject to moisture damage, such as insulation or electrical components in dry, heated spaces.

D. Provide adequate means for fully protecting finished parts of the materials and equipment against damage from whatever cause during the process of the work until final acceptance.

E. Do not install damaged items. Take immediate steps to obtain replacement or repair. Replace all wet or damp insulation or acoustic lining.

F. Do not operate water systems until piping has been cleaned, disinfected and start-up strainers are in place.

3.7 QUALITY OF WORK

A. The quality of work shall be of a standard generally accepted in the respective trade. Use only experienced, competent, and properly equipped workers. Replace work falling below this standard as directed by the Architect.

B. Systems shall be worked into a complete and integrated arrangement with like elements arranged neatly with adequate head room and passageway free from obstructions.

3.8 FURRING AND PIPE SPACES

A. Spaces provided in the design of the building shall be utilized and the work shall be kept within the furring lines established on the Drawings.

B. Ensure necessary clearances on trim plates at exposed penetrations of walls and floors. If sufficient room is not available above suspended ceiling or vertical shafts obtain clarification from Architect before work is started.

3.9 CUTTING AND PATCHING

A. Do not cut, channel or drill unfinished masonry, tile, etc. unless written permission is obtained from the Architect. Perform this work in a manner acceptable to the Architect. Cutting of structural members or footings is prohibited without the prior written consent of the Structural Engineer.

B. Where cutting, channeling or drilling of floors, walls, partitions, ceilings, or other surfaces is necessary from the proper installation, support or anchorage of piping or equipment, lay out the work carefully in advance. Repair any damage to the building, piping, equipment or finishes using skilled tradesmen for all required work.

C. Provide slots, chases, openings and recesses through floors, walls, ceilings and roofs as required. Where these openings are not provided, provide cutting and patching to accommodate penetrations.

D. Provide sleeves for all piping passing through new floors, walls, partitions, and any other building construction, of adequate diameter to allow minimum of 1” clearance all around between sleeve and piping. When piping is insulated, insulation shall pass continuously through sleeve with 1” clearance between insulation and sleeve or hole in existing construction.

3.10 ACCESS

A. Indicating equipment or specialties requiring reading, adjusting, inspection, repairing, removal, or replacement shall be conveniently and accessibly located with reference to finished building.

B. No controls, or equipment shall be placed in a location that will be inaccessible after the system is complete. Access panels or doors shall be provided where required whether shown on Drawings or not.

C. Access panels shall be 24” x 24” unless otherwise directed, style as selected by the Architect. Panels shall have the same acoustic barrier or rating as the construction in which panel is installed.

D. Doors shall be Milcor, Newman or equal, with concealed hinges, screwdriver locks, prime coated with rust inhibitive paint, finish painted in field to match adjacent surface. Provide key locks where required by Architect/Owner. All access doors shall be keyed the same. Doors in walls of toilet rooms shall be stainless steel.

E. Continuously check installation manuals for clearance and accessibility of equipment. No allowance of any kind will be made for negligence on part of Contractor to foresee means of installing equipment in proper position.

3.11 SEISMIC RESTRAINTS

A. All equipment, piping, and materials shall be fastened and securely anchored to building structure as required by the Drawings, Specifications, OSHPD Preapproval of Manufacturer’s Certification OPM-0295-13 and OPM-0052-13, and the California Building Code.

B. Piping shall be braced as follows:

1. Brace all gas piping that is 1” nominal diameter and larger.
2. Brace all piping located in mechanical equipment rooms that is 1 1/4” nominal diameter and larger.
3. Brace all piping that is 2 1/2" nominal diameter and larger.
4. Transverse bracings at 40’-0” on center maximum (minimum of one brace per direction of run).
5. Longitudinal bracings at 80’-0” on center maximum (minimum of one brace per direction of run).
6. Transverse bracing shall be 20’-0” on center maximum and longitudinal bracing at 40’-0” on center maximum for gas piping and piping in mechanical rooms.
7. Transverse bracing for one pipe section may also act as longitudinal bracing for the pipe section connected perpendicular to it, if the bracing is installed within 24” of the elbow or tee and is connected to the largest pipe.
8. Do not use branch lines to brace main lines.
9. Provide flexibility in joints where pipes pass through building seismic or expansion joints or where rigidly supported pipes connect to equipment with vibration isolators.
10. At vertical pipe risers, support the weight of the riser at a point or points above the center of gravity of the riser wherever possible. Provide lateral guides at the top and bottom of the riser and at intermediate points not to exceed 30’-0” on center.
11. No bracing is required if the top of single pipe is suspended 12” or less from the connection point at the supporting structural member.

3.12 MANUFACTURER'S DIRECTIONS

A. Materials and equipment shall be installed in accordance with manufacturer's application and recommendations, requirements, and instructions, and in accordance with Contract Documents.

B. Conflicts between manufacturer's instructions and Contract Documents shall be brought to the Architect's attention for resolution prior to installation.

C. Where requirements indicated in Contract Documents exceed manufacturer's requirements, Contract Documents shall govern.

3.13 ELECTRICAL EQUIPMENT AND ELECTRICAL ROOM PRECAUTIONS

A. Do not install piping, equipment, plumbing, or any piping systems not included as part of the electrical work in the following rooms: switchgear, transformer, generator, elevator equipment, telephone, fire command, security, dimmer or electrical equipment rooms.

B. Do not install piping or equipment within the code required service space for switchboards, disconnects, panelboards, dimmers, control panels, VFDs, individual motor controllers, electronics, etc.

3.14 CATHODIC PROTECTION

A. Install dielectric unions at points in piping where dissimilar metal pipes are connected together.

3.15 PIPING AND EQUIPMENT IDENTIFICATION

A. Furnish and install engraved nameplates with 1/4" minimum lettering at panel mounted control devices, manual control stations, power disconnects, and pieces of equipment. Nameplates shall be white lettering on black background. For outdoor locations, provide brass engraved nameplates or plastic rated for outdoor use.

B. Each piping system installed under this work shall be identified and the direction of flow indicated. Markings shall be applied after all painting, priming, and cleaning of the piping and insulation is completed. Labels shall be black lettering on colored backgrounds. Lettering shall be easily readable from the floor and background colors easily discernible. Furnish labels in every room and every 20' of pipe length.

C. Tag all valves with 2" diameter brass tags noting the valve number and contents in the pipe. At the completion of the project, provide Owner with a valve listing for all valves installed in the project. Valve listing shall note valve tag number, contents in the pipe and the areas (room numbers, etc.) that are impacted by valve.

3.16 GUARANTEE

A. The Contractor shall guarantee the quality of all work and the quality of the equipment and materials in accordance with the provisions of the General Conditions and Special Conditions. Should any defects occur during this period, the Contractor shall promptly repair or replace defective items as directed by the Architect, without cost to the Owner.

B. Contractor shall be responsible for damage to any part of premises during guaranteed period caused by leaks or breaks in work furnished and/or installed under this Section.

3.17 TESTING

A. Test all equipment, piping, and systems as called for in the Specifications. Notify Architect and inspection authorities prior to testing so that they may be witnessed. Protect all personnel and equipment during testing.

3.18 OPENINGS

A. Locating and sizing of all openings for piping through walls, roof, etc. shall be done under this Division. Framing of openings shall be done by the respective trades in whose work the opening is made.

3.19 CLEAN-UP

A. During the course of work under this Division, all rubbish, debris, surplus materials, tools, etc. resulting from this work shall be removed from work area and shall be disposed of off-site at the end of each working day. The Owner's premises shall be left clean, and in a condition acceptable to the Architect.

B. Clean all work installed under this Contract to satisfaction of Owner.

3.20 PUNCH LIST

A. Respond to Architect's punch list in writing within 10 days of receipt. Include action plan and an estimated timeline for completion.

B. Submit photographs of completed items.

3.21 OPERATING INSTRUCTIONS AND OPERATOR TRAINING

A. Provide the services of factory-trained specialists to supervise the operation of all equipment and train the Owner's operating and maintenance personnel.

B. Instruct the Owner's operating personnel in the basis of design, the available documentation, the proper starting sequences, operation, shut-down, minor adjustments, troubleshooting, recommended spare parts, and regular maintenance procedures.

C. Submit training agenda, schedule and list of representatives to the Owner for review ten (10) days prior to training. Confirm attendance at training by sign-in sheet. At a minimum, the training agenda shall cover all items required to be provided in the operating and maintenance manuals.

3.22 OPERATING AND MAINTENANCE MANUALS

A. Provide operating instructions and maintenance manuals for all equipment and material furnished under this Division.

B. Provide the following equipment and maintenance information where applicable:

1. Systems and Equipment Controls – describe sequence of operation and diagram controls as required.
2. Identifying equipment manufacturer, product name, and model number.
3. Locations.
4. Wiring Diagrams.
5. Manufacturer's recommended operating and maintenance instructions, with all non-applicable information deleted.
6. Assembly and disassembly instructions.
7. Startup procedures.
8. Routine and normal operating instructions.
9. Normal and emergency shutdown instructions.
10. Troubleshooting diagnostic instructions.
11. Parts list and recommended spare parts including name and address of source of supply.

C. Contractor must start compiling above data immediately upon approval of submittals for equipment and materials.

D. Submit one (1) electronic copy of operating and maintenance manuals, indexed and bookmarked, for review by Architect/Engineer.

E. Submit three (3) complete sets of bound hard copies of operating and maintenance manuals, and one (1) electronic copy to Owner within thirty (30) days of issuance of final occupancy permit.

END OF SECTION

SECTION 22 05 00

PLUMBING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 01, and Division 22 Sections apply to this Section.

1.2 SCOPE OF WORK

A. Provide labor, materials, equipment, and services to furnish and install complete plumbing and piping systems which shall include, but not limited to fixtures, equipment, piping, valves, and supports.

1.3 SUBMITTALS

A. Submit for review, within fifteen (15) days after signing Contract, the required number of copies of a complete list of materials proposed for use. This list includes:

1. Plumbing fixtures and trim.
2. Piping and fittings.
3. Insulation.
4. Pipe hangers and supports.
5. Valves.
6. Drains and cleanouts.
7. Trap primers and water hammer arrestors.
8. Coordination Drawings: plans and details, drawn to scale, on which piping is shown and coordinated with other installations, using input from installers of the items involved.
9. Site Survey: Plans, drawn to scale, on which natural-gas piping is shown and coordinated with other services and utilities.
10. Welding certificates.

B. No substitute materials or equipment shall be installed without the written approval of the Architect.

C. No increase in the contract price will be considered to accommodate the use of alternative equipment, including revisions required by other trades.

D. Submit test reports on all systems tested. Tests required by Authorities Having Jurisdiction over the work shall be submitted on appropriate forms to the satisfaction of such authorities.

1.4 QUALITY ASSURANCE

A. Steel support welding qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code – Steel."

B. Pipe welding qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.

C. Each length of pipe, fitting, trap, fixture, or device used in any piping system shall be stamped or indelibly marked with type, weight, quality, and manufacturer's name or mark.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Pipes shall be shipped so as not to bend, dent, or otherwise damage the pipe during transport. Contractor shall take all necessary precautions to prevent damage to pipe and fittings during delivery and unloading. Any pipe found to have been damaged due to improper handling shall be removed from the jobsite at Contractor's expense.

B. Handling flammable liquids: Remove and dispose of liquids from existing natural-gas piping according to requirements of authorities having jurisdiction.

C. Deliver pipes and tubes with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe end damage and to prevent entrance of dirt, debris, and moisture.

D. Store and handle pipes and tubes having factory-applies protective coatings to avoid damaging coating, and to protect from direct sunlight.

E. Protect stored PE pipes and valves from direct sunlight.

PART 2 – PRODUCTS

2.1 PLUMBING FIXTURES, TRIM AND ACCESSORIES

A. See Schedules on Drawings for plumbing fixtures. Furnish and install all fixtures in accordance with Drawings, manufacturer's recommendations, and all applicable codes.

B. Fixture locations and heights as shown on Architectural Drawings.

C. Comply with applicable provisions and recommendations of CALGreen for water conservation measures.

D. Provide fixtures complete with all trim and materials, fittings, supports, fastening devices, faucets, valves, traps, and appurtenances required.

E. Lavatories and sinks shall be provided with required number of holes by faucet only, unless otherwise specified or required.

F. Install fixtures level, plumb and set at right angles to wall, floor, or both unless otherwise indicated.

G. Make connections between fixtures and waste pipe gastight and watertight with neoprene type gaskets or bowl wax.

H. Where fittings, trim, and accessories are exposed or semi-exposed, provide chrome plated 17 gauge seamless brass.

I. Where fixture supplies and drains penetrate walls, provide chrome plated brass escutcheons with setscrews.

J. Vitreous china: unmarked, true, clear, smooth and bright. Color shall be white unless otherwise indicated.

K. Porcelain lined ware: constructed of smooth, sound iron castings, properly finished, and provided with first quality, high temperature enamel.

2.2 WATER PIPING AND FITTING MATERIALS

A. All water piping shall comply with NSF/ANSI Standard 372 for low lead requirements.

B. Above Grade: ASTM B88, Type L copper tubing, hard temper with wrought copper fittings.

C. Below Grade: ASTM B88, Type K copper tubing, hard temper with wrought copper fittings.

D. Joints: 1/2" to 1-1/2” pipe sizes soldered using ASTM B32, lead-free alloys. Include water-flushable flux according to ASTM B813. 100 percent lead free, 95 percent tin and 5 percent antimony composition, silver bearing solders unless otherwise indicated.

E. Joints: 2” and larger pipe sizes brazed using AWS A5.8/A5.8M, AWS BCuP Series copper-phosphorous alloys.

F. Press fittings shall be permitted for use where approved by local authorities having jurisdiction and in compliance with current codes.

G. Water Hammer Arrestors: Provide at quick closing valves such as flush valves, etc. Certified under Plumbing and Drainage Institute Standard WH201 and by ASSE Standard 1010.

H. Select and size water hammer arrestors in accordance with Plumbing and Drainage Institute Standard WH201. Install above ceilings or behind wall access door at each plumbing fixture, or where plumbing fixtures are installed in groups, at each group of fixtures.

I. Insulation: Insulate outdoor piping with 1” Glass Fiber Insulation and 0.016 aluminum jacket.

2.3 WATER PIPING VALVES

A. All valves shall be the product of a single manufacturer. Milwaukee, NIBCO, Stockham, Crane, or approved equal. 125 PSIG steam service rated and 300 PSIG air and water rated. All valves shall be low lead type per NSF/ANSI Standard 372.

B. Provide valves with screwed or flanged ends as required by the piping system in which they are installed.

C. Shut-off valves 2 inches and smaller: Ball Valve. Bronze body, two piece, full port, extended handle that allows operation of valve without disturbing the insulation.

D. Shut-off valves 2 1/2 inches and larger: Gate Valve. Iron body, resilient wedge, outside screw and yoke.

E. Check valves: Bronze body, swing check, screwed. Provide non-slam check on pumped equipment or quick closing fixtures.

F. Relief valves: Bronze body, spring and diaphragm combination pressure and temperature relief valves with test lever and automatically resetting type thermostatic element. Tested under ANSI Z21.22 and rated relief capacities greater than water heater's input rating.

2.4 WASTE AND VENT PIPING AND FITTING MATERIALS

A. Above Grade Waste and Vent: Hubless cast iron soil pipe and fittings, service weight per ASTM A888 and Cast-Iron Soil Pipe Institute Standard (CISPI) 301. Couplings conforming to ASTM and CISPI 310; stainless steel covered neoprene gasket sleeve and stainless steel clamps.

B. Below Grade Waste and Vent: ABS Schedule 40 per ASTM D2661 D2680 or PVC Schedule 40 per ASTM D17885 D2665 with solvent weld socket fittings.

C. Above Grade Vent alternate: ABS Schedule 40 per ASTM D2661 D2680 or PVC Schedule 40 per ASTM D1785 D2665 with solvent weld socket fittings may be used for above grade vent.

D. Traps: Provide traps at all fixtures connected to waste systems, except for fixtures having integral traps. Type of trap(s) shall be approved by local codes and be of same material as piping system. Exposed traps for fixtures shall be chrome plated 17 gauge brass.

E. Trap Primers: Pressure drop activated brass trap seal primer with view holes and removable filter screen and requires no adjustments or air pre-charge. Select appropriate model for number of drains being served. Precision Plumbing Products, MIFAB, or approved equal.

F. Drains: Size of drain outlets shall be same as connecting pipe and as indicated on Drawings. Provide trap primer connections on all drains. Drain outlet as required for connection to piping.

G. Temperature and Pressure Relief Drain: Material shall be rated at not less than the operating temperature of the system and approved for such use or shall comply with ASME A 112.4.1.

H. Cleanouts: Install cleanouts of same diameter as pipe (4 inch maximum) where indicated or required by code. Cleanouts shall be installed at all points of change in direction and in horizontal waste lines over 50 feet inside building and 100 feet outside building. Locate minimum 18 inches away from building construction to allow sufficient space for rodding.

1. Provide cleanouts in waste drop from each sink and urinal. Provide one wrench for each size and type of cleanout used.
2. Floor Cleanouts: ZURN Z1400 series, or approved equal. Nickel-bronze, round top, with vandal proof screws.
3. Wall Cleanouts: ZURN Z1446 series, or approved equal with stainless steel cover and vandal proof screws.
4. Unfinished Areas: Zurn Z1440, or approved equal. Cast iron cleanout.
5. Grass or Planting Area: Zurn Z1449, or approved equal. Locate in concrete box and cover.

2.5 UNIONS AND FLANGES

A. Install Watts, Epco, Nibco, or equal, dielectric unions or flanges at points of connection between copper or brass piping or material and steel or cast iron pipe or material except in drain, waste, or vent piping. Dielectric unions installed in potable water systems shall conform to lead free requirements.

B. Install unions in piping 2” and smaller and flanges in piping 2 1/2" and larger at each connection to all equipment, tanks, and automatic valves.

C. Locate unions for easy removal of equipment, tank, or valve.

2.6 PIPE HANGERS AND SUPPORTS

A. Provide adequate supports, hangers, guides, thrusters, etc. as necessary to allow for proper movement of the piping at the building seismic joints and at the thermal expansion loops and flexible connectors, taking into account the pipe size, flex connection type, required seismic movement and system operating temperature and pressure.

B. Acceptable manufacturers: B-line, Tolco, Superstrut, Unistrut, or approved equal.

C. Plumbers tape or sheetmetal straps shall not be used for hanging or supporting of pipes.

D. Support horizontal piping in accordance with the following schedule:

Pipe Size (inches)	Maximum Hanger Spacing (feet)						Hanger Rod Diameter (inches)		
	Steel	Cast Iron	Copper	Plastic			Steel / Cast Iron	Copper	Plastic
				CPVC	PVC	PP			
Up to 1	7	-	5	3.5	3	2.75	3/8	3/8	3/8
1 1/4	9	-	6	3.5	3	2.75	3/8	3/8	3/8
1 1/2 & 2	9	5	8	3.5	3.5	2.75	3/8	3/8	3/8
2 1/2	12	5	8	3.5	3.5	3.5	1/2	1/2	1/2
3	12	5	10	3.5	3.5	3.5	1/2	1/2	1/2
3 1/2	-	5	10	-	-	-	5/8	1/2	-
4	12	5	10	4	4	4	5/8	5/8	5/8
5	12	5	10	4	4	4	5/8	5/8	5/8
6	12	5	10	4	4	4	3/4	3/4	3/4
8 to 12	12	5	10	4	4	4	7/8	3/4	7/8

E. Provide hangers at each change in direction and both sides of valves 4-inch and larger. Place a hanger within 12 inches of each horizontal elbow, valve, strainer, or similar piping specialty item.

F. Support Steel piping on the roof in accordance with the following schedule:

Nominal Pipe Size (inches)	Spacing of Supports (feet)
1/2	6
3/4 or 1	8
1 1/4 or larger	10
1 1/4 or larger (Vertical)	Every floor level

For pipes on roof other than steel pipe, match support spacing from previous Hanger table above.

PART 3 – EXECUTION

3.1 PREPARATION

A. Close equipment shutoff valves before turning off natural gas to premises or piping section.

B. Inspect natural gas piping according to NFPA 54 to determine that natural gas utilization devices are turned off in piping section affected.

3.2 PIPE SIZES TO EQUIPMENT

A. Pipe sizes indicated, including required valving, shall be carried full size to equipment served. Any change of size to match equipment connection shall be made within 1’-0” of equipment.

3.3 PIPING GENERAL INSTALLATION

A. Thoroughly clean all pipe and maintain in clean condition during construction temporarily capping or plugging ends of pipe when not being worked on.

B. Cut pipes accurately to measurements established at the site and work into place without springing or undue forcing and out of the way of openings, ductwork, and equipment; ream ends of screwed pipes and tubing to original bore before connecting together.

C. Protect all piping located over switchboards, electrical machinery, or equipment against condensation. Insulate piping and install sheetmetal pan underneath piping running above electrical equipment and panels.

D. Where changes in pipe size occur, use only reducing fittings.

E. Provide screwed unions or flanges in locations required for disconnecting and connecting of all equipment.

F. Pipe runs in masonry and concrete floors shall be sleeved for protection.

G. Chase or sleeve all lines rising in footings and where running concealed through walls.

H. Caulk space between pipes and sleeves in exterior walls and in concrete slabs with graphite packing and waterproof plastic compound; caulk with Dow Corning #3 6548 Silicone RTV Foam per manufacturer's recommendations at fire walls.

I. Place escutcheons, stamped with #16 gauge steel and chromium plated, on pipes passing through sleeves in walls, floors or ceiling where exposed to view within a finished area. Grout in all other lines.

J. Support piping where necessary at sufficiently close intervals (and 24" from each fitting and change of direction) to keep it in alignment and to prevent sagging.

K. Anchor vertical risers with hooks, brackets, or clamps to make rigid.

L. All changes of direction of piping shall be made with fittings. Do not bend pipe.

M. Flash roof vent piping through roof with 24 gauge or heavier galvanized flashing. Make watertight with black fibrous mastic. Extend flashing into roofing felt 12” from pipes.

N. Insulate cold water piping outdoors for freeze protection.

3.4 PIPING JOINT CONSTRUCTION

A. Ream ends of pipes and tubes and remove burrs.

B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

C. Threaded Joints:

1. Thread pipe with tapered pipe threads complying with ASME B1.20.1.
2. Cut threads full and clean using sharp dies.
3. Ream threaded pipe ends to remove burrs and restore full inside diameter of pipe.
4. Apply appropriate tape or thread compound to external pipe threads unless dryseal threading is specified.
5. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

D. Welded Joints:

1. Construct joints according to AWS D10.12/D10.12M, using qualified processes and welding operators.
2. Bevel plain ends of steel pipe.
3. Patch factory-applied protective coating as recommended by manufacturer at field welds and where damage to coating occurs during construction.

E. Brazed Joints:

1. Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter.

F. Flanged Joints:

1. Install gasket material, size, type, and thickness appropriate for natural-gas service. Install gasket concentrically positioned.

G. Flared Joints:

1. Cut tubing with roll cutting tool. Flare tube end with tool to result in flare dimensions complying with SAE J513. Tighten finger tight, then use wrench. Do not overtighten.

H. PE Piping Heat-Fusion Joints:

1. Clean and dry joining surfaces by wiping with clean cloth or paper towels. Join according to ASTM D 2657.
2. Plain-End Pipe and Fittings: Use butt fusion.
3. Plain-End Pipe and Socket Fittings: Use socket fusion.

3.5 WASTE, VENT AND CONDENSATE DRAIN PIPING INSTALLATION

A. Lay piping in straight lines at a minimum slope of 2 percent in direction of flow of drainage system, unless otherwise noted on the Drawings.

B. Keep stopper in mouth of pipe when pipe when pipe laying is not in process.

C. Make changes in direction with long sweep or bends. Do not change direction of flow more than 90 degrees.

D. Reducing size of drainage piping in direction of flow is prohibited.

E. Make connections of branches to mains with “Y” fittings and 1/8 or 1/16 bends.

F. Install traps and fresh air inlets where required by code regulations.

G. Install traps with offset drain where required to meet ADA clearances.

H. Install trap primers discharge piping appropriate for trap primers installed. Coordinate discharge piping routing and method of connection to inlet side of floor drain and ensure discharge piping has positive drainage towards connection point floor drain. Slope piping at 1/8” per foot.

I. Install cleanouts at ends of horizontal runs in excess of 5’-0” and every 100’-0” of horizontal run.

J. Makeup cleanout plugs with graphite and oil to facilitate easy removal.

K. Extend vents through roof. Vents may be combined in accordance with California Plumbing Code. Arrange piping passing through roofs to be a minimum of 12 inches from walls or other obstructions so as to permit proper flashing.

L. Do not terminate vent outlet less than ten (10) feet from air intakes.

M. Deliver to the owner at completion of work two (2) suitable wrenches for each type of cleanout installed.

N. Take necessary precautions to protect cleanouts during course of construction.

O. Contractor to inquire from Owner the time to make tie-in to existing systems.

3.6 WATER PIPING INSTALLATION

A. Extend piping for hot and cold water, including mains, risers, and supplies to fixtures and indicated equipment. Carry headers for groups of fixtures full size throughout their length.

B. All domestic water piping shall be arranged to drain to low points and to provide for air elimination at high points.

C. All ferrous to non-ferrous pipe connections shall be made with accepted dielectric pipe or flange union isolating joints to prevent any electrolytic action between dissimilar metals.

D. Insulate all domestic hot and hot water return piping and fittings.

E. Make changes in pipe sizes with reducing tees or reducer fittings.

F. Install a shut off valve at domestic water line to each fixture group so that each group can be shut off without shutting down the other parts of the system.

G. Provide shut off valves for all plumbing equipment, fixtures, and fixture trim which do not have supply stop or integral isolation valves included.

H. Arrange and orientate valves, trap primers, water hammer arrestors, etc. in manner accessible for maintenance and/or removal.

I. No water piping will be permitted below slab on grade unless shown on Drawings.

J. Contractor to inquire from Owner the time to make tie-in to existing systems.

3.7 HANGER AND SUPPORT INSTALLATION

A. Support exposed piping tight to wall with support channels and pipe clamps. All pipe clamps shall include rubber cushion.

B. Install hangers, supports, clamps, and attachments as required to properly support piping from building structure. Comply with OSHPD Preapproval of Manufacturer’s Certification OPM-0295-13 and OPM-0052-13, and the California Building Code.

C. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories.

D. Install lateral bracing with pipe hangers and supports to prevent swaying.

E. Install hangers and supports so piping live and dead loads and stresses from movement will not be transmitted to connected equipment.

F. Install hangers and supports to provide indicated pipe slopes and so maximum pipe deflections allowed by ASME B31.9 are not exceeded.

G. Adjust hangers to distribute loads equally on attachments.

H. Trim excess length of continuous-thread hanger and support rods to 1 1/2 inches.

3.8 EXCAVATION AND BACKFILL

A. Provide excavation for the work of this Division. Excavate all material encountered, to the depths indicated on the Drawings or as required. Remove excavated materials not required or suitable for backfill from the site. Provide grading as may be necessary to prevent surface water from flowing into trenches or other excavations. Remove any water that accumulates. Provide sheeting and shoring as may be necessary for the protection of the work and for the safety of personnel.

A. Provide trenches of widths necessary for the proper execution of the work. Grade bottom of the trenches accurately to provide uniform bearing and supp ort the work on undisturbed soil at every point along its entire length.

B. Bedding shall be on minimum 6” deep layer of sand placed on leveled trench bottom. Sand removed to necessary depth for piping bells and couplings to maintain contact of pipe on sand for entire length. All other piping laid on smooth level trench bottom to maintain contact for entire length.

C. All backfill shall be bank run sand and/or gravel to 6” above piping up to slab on interior piping below slabs. All backfill placed in layers not exceeding 8” deep and compacted to 95% maximum density at optimum moisture content per AASHTO Standards.

D. Following backfilling, grade all trenches to level of surrounding subgrade. All excess soil shall be located per Owner’s instructions.

E. Do not backfill trenches until all required tests have been performed and the installation observed by the Architect.

F. After backfilling, remove all surplus earth resulting from this work from the premises and dispose off site.

3.9 PAINTING

A. Paint exposed, exterior metal piping, valves, service regulators, earthquake valves, and piping specialties except components with factory-applied paint or protective coating.

1. Alkyd System: MPI EXT 5.1D.
    a. Prime Coat: Alkyd anticorrosive metal primer.
    b. Intermediate Coat: Exterior alkyd enamel matching topcoat.
    c. Topcoat: Exterior alkyd enamel (flat).
    d. Color: Gray or as selected by Architect.

B. Paint exposed, interior metal piping, valves, service regulators, earthquake valves, and piping specialties except components, with factory-applied paint or protective coating.

2. Latex Over Alkyd Primer System: MPI INT 5.1Q.
    a. Prime Coat: Alkyd anticorrosive metal primer.
    b. Intermediate Coat: Interior latex matching topcoat.
    c. Topcoat: Interior latex (flat).

d. Color: Gray or as selected by Architect.

C. Damage and Touchup: Repair marred and damaged factory-applied finishes with materials and by procedures to match original factory finish.

D. Refer to Division 09 for additional painting requirements.

3.10 TESTING, ADJUSTING, AND CLEANING

A. Provide testing of all installed gas, domestic water, drainage and vent systems during progress of work. Such tests shall be done in the presence of the Owner's representative, and all Authorities Having Jurisdiction. The inspection authority having jurisdiction and the Engineer shall be notified a minimum of 48 hours prior to performance of all tests so that they may be witnessed.

B. Provide the Architect with certified copies of the test results in written format. At a minimum include the date of the test, witnesses present, sections tested, length of tests, starting and final pressures.

C. Contractor shall provide all apparatus, temporary work, or any other requirements necessary for such tests. Take all due precautions to prevent damage to the building or its contents that may be incurred by such tests as the Contractor will be required to repair and make good, at own expense, any damage caused.

D. Any defects or deficiencies discovered as result of tests shall be immediately repaired and tests shall be repeated until all test requirements are fully met. No caulking of pipe joints to remedy leaks shall be permitted.

E. Gas Piping: All gas piping shall be tested per NFPA 54 to 60 psig for 1 hour without drop in pressure. Equipment and personnel shall be protected from this test procedure. Measure natural gas system test pressure with a water manometer or an equivalent device calibrated in increments not greater than 0.1 inch water column. System shall not be approved until it can be demonstrated that there is no measurable loss of test pressure during test period.

F. Waste and Condensate Drain Piping: All waste and condensate drain systems shall be tested hydraulically by filling to the highest vent point with water. Piping may be tested in sections. Each section of drainage piping tested shall have all openings tightly closed with screw plugs, or equal device, and stand without loss of level for a period of 4 hours when filled with water which produces at least a 10-foot head at the highest point of the section tested.

G. Water Piping: All water piping shall be tested to 100 psig with potable water and held for 8 hours without drop in pressure before it is covered and concealed. Equipment and personnel shall be protected from this test pressure. After fixtures are connected, test system for 2 hours at 75 psig or prevailing water pressure, whichever is higher.

H. Adjust and regulate all faucets, valves, water heating equipment, etc. and turn over to the Owner in perfect working order.

I. Upon completion of work, clean all equipment and piping installed under this Section.

3.11 DISINFECTION

A. Upon completion of all tests and necessary replacements, all domestic water piping shall be disinfected. Chlorination shall be accomplished by personnel in direct employ of a firm licensed to do this type of work. After work has been accomplished, provide the Owner and Architect with a statement from the laboratory indicating the water is suitable for human consumption.

B. Prior to testing, flush piping with clean water until clean water free of silt or grit is observed for at least one minute.

C. Comply with local requirements where local code requirements are more stringent. Provide necessary labor, equipment, material, and test kits for chlorine application and tests. Make all arrangements with jurisdictional water authority for witnessing chlorination tests and tests of proper disinfection.

D. Sterilize all parts of building water system with water solution containing 50 ppm of available chlorine for at least a 24 hour contact period. After contact period, flush all parts of system with clear water until system tests at no more than 0.2 ppm residual chlorine.

E. Flush thoroughly and submit bacteriological samples to a certified laboratory which shall certify in writing that the water is suitable for drinking.

3.12 TRAINING AND O&MS

A. Refer to Section 22 00 00 Plumbing General Requirements and Division 01 for Training requirements, Operating and Maintenance Manuals, and other Closeout procedures.

END OF SECTION

SECTION 23 00 00

MECHANICAL GENERAL REQUIREMENTS

PART 1 – GENERAL

1.1 CONDITIONS AND REQUIREMENTS

A. Refer to the General Conditions, Supplementary Conditions, and Division 01 General Requirements.

1.2 SCOPE OF WORK

A. Provide all labor, apparatus, and materials that are required to provide a complete installation as indicated on the drawings and in the specifications, including that reasonably inferred for proper execution of this Division.

B. Consult all other Sections to determine the extent of this work specified elsewhere.

C. Coordinate all utility requirements for equipment furnished under this Division. Rough-in required systems and make final connections.

1.3 REGULATIONS AND STANDARDS

A. Install all work to meet or exceed requirements prescribed by governmental bodies having jurisdiction and in accordance with all federal, state, and local codes and ordinances, and all OSHA requirements. These codes include, but are not limited to the latest applicable edition of the following:

1. California Building Code
2. California Electrical Code
3. California Plumbing Code
4. California Mechanical Code
5. California Energy Code
6. California Green Buildings Standard
7. California Fire Code
8. National Fire Protection Association

1.4 QUALITY ASSURANCE

A. Comply with current governing codes, ordinance and regulations of the Authority Having Jurisdiction and the regulations and requirements of the Owner’s insurance underwriter.

B. Where requirements differ between drawings, specifications, codes and standards, apply the more stringent.

C. Should any change in drawings or specifications be required to comply with governing regulations, notify the Architect prior to submitting bid.

D. After contract is awarded, if minor changes or additions are required by the aforementioned authorities, even though such work is not shown on drawings or overtly covered in the specifications, they shall be included at the Contractor's expense.

E. Execute work in strict accordance with the best practices of the trades in a thorough, substantial, skillful and well-executed manner by competent workers. Provide a competent, experienced full-time Superintendent who is authorized to make decisions on behalf of the Contractor.

F. The Architect or Architect's Representative may conduct unannounced field reviews of any work completed or in progress. A report will be issued for all items that are found to be inconsistent with the contract documents. All items in the report shall be addressed in writing by the Contractor within two (2) weeks.

1.5 SAFETY

A. Contractors must conduct a weekly safety meeting with their employees and maintain documentation of attendance and topics of discussion. Contractor shall comply with all OSHA regulations. Contractor is required to obtain and pay for insurance required to cover all activities withing Contractor's scope of work.

1.6 PERMITS, FEES, AND UTILITIES

A. Secure and pay for all permits, licenses, inspections, and fees required.

B. Coordinate with other Sections and schedule sequence of accomplishing the work in such a manner as not to interrupt existing services and utilities at a time that will inconvenience the Owner. Provide Owner a minimum 48 hour notice when utilities will be interrupted.

1.7 PAINTING

A. See Division 09 for painting.

1.8 COORDINATION

A. Coordinate with work performed by other Sections in order to ensure adequate space and proper location of all necessary work on this project whether or not work is under this Section. Coordination shall be done prior to order or manufacture of any systems or components.

B. At a minimum, coordinate location of each piece of equipment, requirements for access panels, space required for supports, power requirements for each piece of equipment, and control requirements for each piece of equipment.

C. Coordination meetings shall happen within the first two weeks of construction start. Coordination meeting minutes shall be submitted to the Architect for review.

D. Prepare complete set of construction coordination shop drawings indicating equipment actually purchased and exact routing of all piping and ductwork. Requirement for coordination shop drawings shall not be construed as authorization for contractor to make unauthorized changes to Contract Documents. Prior to final acceptance, contractor shall submit the coordination shop drawings as part of the record drawings.

E. Wherever the work is of sufficient complexity, prepare additional detail drawings to scale to coordinate the work with the work of other trades. At completion, include a set of these drawings with the record drawings.

F. Install the work in cooperation with other trades. Before installation, make proper provisions to avoid interferences.

G. No additional costs will be considered for work which has to be relocated due to conflicts with other trades or for additional equipment/parts that need to installed due to a lack of coordination prior to, or during, construction.

PART 2 – PRODUCTS

2.1 EQUIPMENT AND MATERIALS

B. Provide products and materials that are new, clean, free of defects, damage and corrosion. Inspect all materials and remove defective materials from the site.

C. Provide materials and equipment bearing the label of, or listed by, the Underwriter's Laboratories (UL), unless the material or equipment is of a type for which label or listing service is not provided.

D. Furnish all materials and equipment of the same type by the same manufacturer.

E. Statically and dynamically balance rotating equipment for minimum vibration and lowest operating noise level.

2.2 ALTERNATE EQUIPMENT AND MATERIALS

A. No substitute materials or equipment may be installed without the written approval of the Architect.

B. Contract documents are based on materials specified and equipment manufacturers indicated. Acceptance of alternative equipment manufacturers does not relieve Contractor of the responsibility to provide equipment and materials which meet the quality and performance stated or implied in the contract documents.

C. All submittals for substitution must include comparison to show equal with scheduled equipment. Submit proposals to supply alternate materials or equipment, in writing, with sufficient lead time for review prior to the date equipment must be ordered to maintain project schedule.

D. No increase in the contract price will be considered to accommodate the use of alternative equipment, including revisions required by other trades.

2.3 SUBMITTALS

A. Submit shop drawings, manufacturer's data, samples and test reports as specified.

B. The review of submittals is for general compliance with the design concept and contract documents. Comments or absence of comments does not relieve the Contractor/Vendor/Manufacturer from compliance with the contract documents. The Contractor remains solely responsible for details and accuracy, for confirming and correlating all quantities and dimensions, for selecting fabrication processes, for techniques of construction, for performing the work in a safe manner, and for coordinating the work with that of other trades.

C. No part of the work shall be ordered, procured, or installed until that work has been submitted, reviewed, and returned without comment.

D. Items indicated in submittal comments shall be provided and installed by contractor.

E. The Engineer and/or Architect shall review the submitted documents for general conformance with the design concept of the project. The review does not relieve the Contractor of the responsibility of deviations from the requirements stated in the contract documents.

F. The Engineer's and/or Architect's review shall not be construed as a completed detailed check of the work submitted, nor shall it relieve the Manufacturer or Contractor of responsibility for errors or omissions of any sort or from the necessity of furnishing any work required by the contract documents.

G. Submittals are not reviewed for quantities, dimensions, weights, fabrication processes, construction methods, coordination with work of other trades, construction safety practices, service clearance, location of control and electrical panels, and other layout constraints. These items shall remain the sole responsibility of the Contractor.

H. A minimum period of ten (10) working days will be required in the Engineer's office each time a submittal is sent for review. Contractor shall prioritize submittal reviews where multiple submittals are sent for review. This time period must be considered by the Contractor in the scheduling of the work.

I. Submittals will be returned to indicate appropriate action taken as follows:

1. No Exceptions Taken.
2. Make Corrections Noted. No Resubmittal Required.
3. Revise and Resubmit.
4. Rejected.
5. Not Reviewed.

J. Use electronic form acceptable to Architect for electronic submittals, containing the following information:

1. Project name.
2. Date.
3. Name and address of Architect and Engineer.

4. Name of Owner.
5. Name, address and contact information of Contractor.
6. Names and contact information of sub-contractor, manufacturer, and supplier.
7. Name of entity that prepared submittal.
8. Category and type of submittal.
9. Specification Section number and title.
10. Drawing number and detail references, as appropriate.
11. Transmittal number, numbered consecutively and revision number clearly identified.
12. Each item submitted labeled or identified the same as on the drawings.

K. Identify each sheet of submittal pages (using arrows, underlining or circling) to show applicable sizes, types, model numbers, ratings, capacities and options actually being proposed. Cross out non-applicable information.

L. Organize submittals to keep all related items together; break submittal into sections and provide appropriate identifying tags on submittal pages to indicate item being submitted.

M. Provide a bookmark for each submittal section. Include a table of contents at beginning of submittal.

N. Submit all items related to specification section in single submittal file. Partial submittals will be deemed incomplete and not reviewed.

O. Inadequate or incomplete submittals will not be reviewed and will be returned to the Contractor for resubmittal.

P. Place orders for all equipment in time to prevent any delay in construction schedule or completion of project. No additional costs will be considered for any special handling charges or expedited processing required for materials or equipment not ordered in time.

2.4 REQUEST FOR INFORMATION

A. While every effort has been made to coordinate the locations of equipment covered under other sections or divisions of these specifications, it is the responsibility of the Contractor to coordinate the exact requirements governed by actual job conditions. Check all information and report any discrepancies before submitting bid or fabricating work.

B. Report discrepancies in time to avoid unnecessary work, and make changes as directed by the Architect.

C. Do not make changes or additions that are subject to additional compensation without written authorization, based upon an agreed price. Any changes made without the above-mentioned authorization shall be at Contractor's own risk and expense.

D. Follow manufacturer’s instructions where they cover points not specifically indicated. However, if they are in conflicts with these drawings and specifications, obtain clarifications from the Architect before starting work.

E. All requests for information shall be accompanied with Contractor's proposed solution.

PART 3 – EXECUTION

3.1 EXAMINATION OF SITE

A. The Contract Documents do not make representations regarding the character or the extent of the subsoils, water levels, existing structural, mechanical, plumbing, and electrical installations, above or below grade, or other sub-surface conditions which may be encountered during the work.

B. Evaluate existing conditions that may affect methods or cost of performing the work, based on examination of the site or other information. Failure to examine the Drawings or other information does not relieve the Contractor of responsibility for satisfactory completion of the work.

3.2 DRAWINGS

A. Drawings show general arrangement and location of ductwork, piping, and equipment. Drawings are diagrammatic and intended to show approximate location and routing. Dimensions on drawings shall take precedence over scaled dimensions on drawings. Allow for supports, expansion, and pitch of ducts and piping. Field verify all dimensions.

B. The exact locations of equipment, ducts, piping, and registers shall be ascertained from the Architect or the Owner's representative in the field. The Architect reserves the right to make minor changes in the location of ducts, registers, piping, and equipment up to the time of installation without additional cost.

C. Furnish and install any incidental work not shown or specified which can reasonably be inferred as part of the work and necessary to provide a complete and workable system. This includes any wiring of sensors, switches, etc.

D. Execute any work or apparatus shown on the Drawings and not specifically mentioned in the Specifications, or vice versa. Omission from Drawings or Specifications of any minor details of construction, installation, materials, or essential specialties does not relieve Contractor from furnishing complete workable system.

3.3 RECORD DRAWINGS

A. Contractor shall maintain a complete set of documents on site that are marked up during the construction process indicating all changes that have been made. Record drawings shall be maintained up to date throughout construction. Indicate clearly all work installed differently from that shown.

B. Upon completion of work, certify all record drawings with a stamp including the date and name of Contractor. Submit one (1) complete, bookmarked, set of electronic record drawings to the Architect for final review.

C. Record drawings must include the following as a minimum:

1. Actual equipment locations.

2. Revisions or substitutions to equipment schedules.
3. Duct/pipe size and routing.
4. Dimensional changes to drawings.
5. Revisions to details shown on drawings.
6. Changes made by RFIs, Addenda, or Change Orders.
7. Locations of access panels and shut-off valves.
8. Locations and depths of underground utilities.
9. Controls sequence of operations.

3.4 PROTECTION OF BUILDING

A. Protect new and existing building structures and adjacent finished surfaces during construction. Patch, repair, and refinish existing work damaged by work under this Division to match adjacent undisturbed areas.

3.5 DELIVERY, DRAYAGE AND HAULING

A. Include all drayage, hauling, hoisting, shoring and placement in the building of equipment specified and be responsible for the timely delivery of equipment to the project as required by the construction schedule.

B. Provide proper protection and storage of all items and tools required.

C. If equipment is not delivered or installed at the project site in a timely manner as required by the construction schedule, the Contractor shall be responsible for disassembly, re-assembly, manufacturer's supervision, shoring, general construction modification, delays, overtime costs, etc. at no additional cost to the Owner.

3.6 EQUIPMENT AND MATERIAL PROTECTION

A. Protect the work, equipment, and material of other trades from damage by work or workers of this trade, and correct damage caused without additional cost to the Owner.

B. The Contractor shall be responsible for all work, materials, and equipment until finally inspected, tested, and accepted. Protect work against theft, injury, or damage. Carefully store material and equipment received on site that is not immediately installed.

C. Cover open ends of work with temporary covers or plugs during construction to prevent entry of dust, dirt, water or other obstructing material. Cover and protect equipment and materials from damage due to water, humidity, paint, spray-on fireproofing, construction debris, etc. Store equipment subject to moisture damage, such as insulation or electrical components in dry, heated spaces.

D. Provide adequate means for fully protecting finished parts of the materials and equipment against damage from whatever cause during the process of the work until final acceptance.

E. Do not install damaged items. Take immediate steps to obtain replacement or repair. Replace all wet or damp insulation or acoustic lining.

3.7 QUALITY OF WORK

A. The quality of work shall be of a standard generally accepted in the respective trade. Use only experienced, competent, and properly equipped workers. Replace work falling below this standard as directed by the Architect.

B. Systems shall be worked into a complete and integrated arrangement with like elements arranged neatly with adequate head room and passageway free from obstructions.

3.8 CUTTING AND PATCHING

A. Do not cut, channel or drill unfinished masonry, tile, etc. unless written permission is obtained from the Architect. Perform this work in a manner acceptable to the Architect. Cutting of structural members or footings is prohibited without the prior written consent of the Structural Engineer.

B. Where cutting, channeling or drilling of floors, walls, partitions, ceilings, or other surfaces is necessary from the proper installation, support or anchorage of ductwork, piping, or equipment, lay out the work carefully in advance. Repair any damage to the building, piping, equipment or finishes using skilled tradesmen for all required work.

C. All core drilling, bolt anchor insertion, or cutting of existing structural concrete shall be approved prior to execution of any construction. At all structural concrete to be drilled, cut or bolt anchors inserted, the contractor shall find and mark all reinforcing in both faces located by means of x-ray, pach-ometer, or prof-ometer. Submit sketch showing location of rebar and proposed cuts, cores, or bolt anchor locations for approval.

D. Provide slots, chases, openings and recesses through floors, walls, ceilings and roofs as required. Where these openings are not provided, provide cutting and patching to accommodate penetrations.

E. Provide sleeves for all ductwork and piping passing through new floors, walls, partitions, and any other building construction, of adequate diameter to allow minimum of 1” clearance all around between sleeve and ductwork or piping. When ductwork or piping is insulated, insulation shall pass continuously through sleeve with 1” clearance between insulation and sleeve or hole in existing construction.

3.9 ACCESS

A. Damper operators, filters, and indicating equipment or specialties requiring reading, adjusting, inspection, repairing, removal, or replacement shall be conveniently and accessibly located with reference to finished building.

B. No dampers, controls, or equipment shall be placed in a location that will be inaccessible after the system is complete. Access panels or doors shall be provided where required whether shown on Drawings or not.

C. Access panels shall be 24” x 24” unless otherwise directed, style as selected by the Architect. Panels shall have the same acoustic barrier or rating as the construction in which panel is installed.

D. Doors shall be Milcor, Newman or equal, with concealed hinges, screwdriver locks, prime coated with rust inhibitive paint, finish painted in field to match adjacent surface. Provide key locks where required by Architect/Owner. All access doors shall be keyed the same. Doors in walls of toilet rooms shall be stainless steel.

E. Continuously check installation manuals for clearance and accessibility of equipment. No allowance of any kind will be made for negligence on part of Contractor to foresee means of installing equipment in proper position.

3.10 SEISMIC RESTRAINTS

A. All equipment, ductwork, piping, and materials shall be fastened and securely anchored to building structure as required by the Drawings, Specifications, OSHPD Preapproval of Manufacturer's Certification OPM-0295-13 and OPM-0052-13, and the California Building Code.

3.11 MANUFACTURER'S DIRECTIONS

A. Materials and equipment shall be installed in accordance with manufacturer's application and recommendations, requirements, and instructions, and in accordance with Contract Documents.

B. Conflicts between manufacturer's instructions and Contract Documents shall be brought to the Architect's attention for resolution prior to installation.

C. Where requirements indicated in Contract Documents exceed manufacturer's requirements, Contract Documents shall govern.

3.12 BELT DRIVES

A. Belt drives for fans and equipment shall consist of "V" belts and sheaves.

B. Drives that require not more than two belts shall be provided with variable pitch, driving sheaves to provide some speed adjustment above and below the normal required operating speed; the adjustments to be as near equal as practicable.

C. Belts shall be furnished in matching sets.

D. Fan drives for blower-type fans shall be selected for the proper fan speeds required for the air volumes specified or shown on the Drawings at the static pressures indicated. The static pressures indicated show estimated conditions, which may vary under actual operating conditions. Should it be necessary to adjust the fan speeds to obtain the proper air volume, the Contractor shall make the necessary changes to the drives without additional cost the Owner.

3.13 ELECTRICAL MOTORS FOR HVAC EQUIPMENT

A. Provide electric motors for driving the mechanical equipment. Motors shall be of proper power, construction and speed to suit the specified equipment.

B. Motors and motor control equipment shall conform to NEMA standards and shall be UL listed.

C. Coordinate the NEMA type of each motor with the torque and inertia load of the equipment served, and the in-rush current characteristics of the motor with the motor starter selection, so that all items furnished constitute a complete motor control and protection package. Motor shall not operate in the 15% service factor range.

D. Motors located in ducted air streams or subject to outside air elements shall be totally enclosed fan cooled; others shall be open drip-proof design.

E. Motors used with variable frequency drives shall be designed specifically for use on AC inverter power and adjustable speed applications.

F. Each motor shall be factory-wired to a junction box mounted on the motor or on the driven piece of equipment to facilitate single point of field power connection under Division 26.

G. Motors 1/2 HP and smaller shall be rated 120 VAC – single phase – 60 hertz and shall be provided with integral thermal overload protection, unless otherwise indicated.

H. Motors 3/4 HP and larger shall be rated for 208 VAC or 460 VAC – 3 phase – 60 hertz, unless otherwise indicated.

3.14 COORDINATION WITH ELECTRICAL CONTRACTOR

A. Coordinate with the Electrical Contractor on furnishing and installing of controls, motors, starters, etc. Provide copies of submittal and installation data to Electrical Contractor for all items requiring electrical connection.

B. Furnish and install all line voltage and low-voltage temperature control wiring in the Mechanical work, including all interlock wiring between motor starter coils, interlock relays, and temperature control equipment. Conduit for temperature control wiring shall be responsibility of Mechanical Contractor and shall be of type specified in Division 26.

C. Electrical Contractor shall furnish disconnect switches, motor starters, conduit and wiring for line voltage power to the equipment. See Division 26 and Drawings.

3.15 ELECTRICAL EQUIPMENT AND ELECTRICAL ROOM PRECAUTIONS

A. Do not install piping, equipment, or ductwork, plumbing, or any piping systems not included as part of the electrical work in the following rooms: switchgear, transformer, generator, elevator equipment, telephone, fire command, security, dimmer or electrical equipment rooms.

B. Do not install piping, equipment, or ductwork within the code required service space for switchboards, disconnects, panelboards, dimmers, control panels, VFDs, individual motor controllers, electronics, etc.

3.16 LUBRICATION

A. Provide means for lubricating all bearings and other machine parts. If a part requiring lubrication is concealed or inaccessible, extend a metallic lubrication tube with suitable fitting to an accessible location and identify it with permanent laminated plastic nameplates. Identify this location in the maintenance manual.

B. After installation, properly lubricate all parts requiring lubrication and keep them adequately lubricated with a lubricant recommended by the equipment manufacturer until Owner acceptance.

3.17 EQUIPMENT GUARDS

A. Provide easily (without tools) removable expanded metal guards for all hot surfaces, belts, couplings, exposed fan inlets and outlets, and other moving parts or machinery. Provide access openings for greasing, oiling, adjusting, etc. All guards shall comply with OSHA requirements and applicable codes.

3.18 CATHODIC PROTECTION

A. Install dielectric unions at points in piping where dissimilar metal pipes are connected together.

3.19 PIPING AND EQUIPMENT IDENTIFICATION

A. Furnish and install engraved nameplates with 1/4” minimum lettering at panel mounted control devices, manual control stations, power disconnects, motor starters, and pieces of equipment. Nameplates shall be white lettering on black background. For outdoor locations, provide brass engraved nameplates or plastic rated for outdoor use.

B. Label each thermostat and switch with equipment connected to the thermostat or switch with black lettering on white background.

C. Each piping system installed under this work shall be identified and the direction of flow indicated. Markings shall be applied after all painting, priming, and cleaning of the piping and insulation is completed. Labels shall be black lettering on colored backgrounds. Lettering shall be easily readable from the floor and background colors easily discernible. Furnish labels in every room and every 20’ of pipe length.

D. Tag all valves with 2” diameter brass tags noting the valve number and contents in the pipe. At the completion of the project, provide Owner with a valve listing for all valves installed in the project. Valve listing shall note valve tag number, contents in the pipe and the areas (room numbers, etc.) that are impacted by valve.

3.20 GUARANTEE

A. The Contractor shall guarantee the quality of all work and the quality of the equipment and materials in accordance with the provisions of the General Conditions and Special Conditions. Should any defects occur during this period, the Contractor shall promptly repair or replace defective items as directed by the Architect, without cost to the Owner.

B. Contractor shall be responsible for damage to any part of premises during guaranteed period caused by leaks or breaks in work furnished and/or installed under this Section.

3.21 TESTING

A. Test all ductwork, equipment, piping, and systems as called for in the Specifications. Notify Architect and inspection authorities prior to testing so that they may be witnessed. Protect all personnel and equipment during testing.

3.22 OPENINGS

A. Locating and sizing of all openings for ductwork and piping through walls, roof, etc. shall be done under this Division. Framing of openings shall be done by the respective trades in whose work the opening is made.

3.23 CLEAN-UP

A. During the course of work under this Division, all rubbish, debris, surplus materials, tools, etc. resulting from this work shall be removed from work area and shall be disposed of off-site at the end of each working day. The Owner's premises shall be left clean and in a condition acceptable to the Architect.

B. Clean all work installed under this Contract to satisfaction of Owner.

C. Remove debris and trash from ductwork, fan units, and all air handling equipment. Vacuum clean fan housing, coils, and ducts in vicinity of openings before grilles and registers are installed. Replace construction filters with new filters prior to project completion.

3.24 PUNCH LIST

A. Respond to Architect's punch list in writing within 10 days of receipt. Include action plan and an estimated timeline for completion.

B. Submit photographs of completed items.

3.25 ACCEPTANCE TESTING

A. Equipment and systems requiring acceptance testing certification for Code Compliance shall have Certificate of Acceptance completed and submitted to enforcement agency. See Drawings for equipment and systems requiring acceptance certification. Tests shall be performed by Certified Mechanical Acceptance Test Technician. Contractor shall be responsible for procuring the required test forms from the California Energy Commission website.

B. The acceptance testing procedures must be repeated, and deficiencies must be corrected by the contractor until the construction/installation of the specified systems conform and pass the required acceptance criteria.

3.26 OPERATING INSTRUCTIONS AND OPERATOR TRAINING

A. Provide the services of factory-trained specialists to supervise the operation of all equipment and train the Owner's operating and maintenance personnel.

B. Instruct the Owner's operating personnel in the basis of design, the available documentation, the proper starting sequences, operation, shut-down, minor adjustments, troubleshooting, recommended spare parts, and regular maintenance procedures.

C. Submit training agenda, schedule and list of representatives to the Owner for review ten (10) days prior to training. Confirm attendance at training by sign-in sheet. At a minimum, the training agenda shall cover all items required to be provided in the operating and maintenance manuals.

3.27 OPERATING AND MAINTENANCE MANUALS

A. Provide operating instructions and maintenance manuals for all equipment and material furnished under this Division.

B. Provide the following equipment and maintenance information where applicable:

1. Systems and Equipment Controls – describe sequence of operation and diagram controls as required.
2. Identifying equipment manufacturer, product name, and model number.
3. Locations.
4. Wiring Diagrams.
5. Lubrication Charts.
6. Manufacturer's recommended operating and maintenance instructions, with all non-applicable information deleted.
7. Assembly and disassembly instructions.
8. Startup procedures.
9. Routine and normal operating instructions.
10. Normal and emergency shutdown instructions.
11. Troubleshooting diagnostic instructions.
12. Parts list and recommended spare parts including name and address of source of supply.

C. Contractor must start compiling above data immediately upon approval of submittals for equipment and materials.

D. Submit one (1) electronic copy of operating and maintenance manuals, indexed and bookmarked, for review by Architect/Engineer.

E. Submit three (3) complete sets of bound hard copies of operating and maintenance manuals, and one (1) electronic copy to Owner within thirty (30) days of issuance of final occupancy permit.

END OF SECTION

SECTION 23 05 00

HEATING, VENTILATING, AIR CONDITIONING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 01, and Division 23 Sections apply to this Section.

1.2 SCOPE OF WORK

A. Provide labor, materials, equipment, and services to furnish and install complete mechanical systems which shall include, but not limited to equipment, ductwork, piping, accessories, insulation, and supports.

1.3 SUBMITTALS

A. Submit for review, within fifteen (15) days after signing Contract, the required number of copies of a complete list of materials proposed for use. This list includes:

1. Fans.
2. Roof Hoods and Caps.
3. Ductwork.
4. Duct Insulation and Lining.
5. Dampers and Duct Accessories.
6. Diffusers, Registers, and Grilles.
7. Louvers.
8. Mechanical Supports.
9. Controls.
10. Coordination Drawings: plans and details, drawn to scale, on which equipment and duct routing is shown and coordinated with other installations, using input from installers of the items involved.

B. No substitute materials or equipment shall be installed without the written approval of the Architect.

C. No increase in the contract price will be considered to accommodate the use of alternative equipment, including revisions required by other trades.

D. Submit test reports on all systems tested. Tests required by Authorities Having Jurisdiction over the work shall be submitted on appropriate forms to the satisfaction of such authorities.

PART 2 – PRODUCTS

2.1 HVAC EQUIPMENT

A. See Schedules on Drawings for equipment data. Furnish and install all equipment in accordance with Drawings, manufacturer's recommendations, and all applicable codes.

2.2 ROOF HOODS AND CAPS

A. Roof hoods shall be of size, type, and capacity noted on Drawings.

B. Roof caps for exhaust shall be of size required for duct dimensions noted on Drawings.

C. Roof hood and cap housing shall be constructed of heavy gauge galvanized steel and shall be fully weatherproof and painted with name. Cap and hood shall be reinforced to prevent oil canning and deflecting in high winds. Roof caps and hoods shall be complete with bird screen and roof curb. Distance of hood from roof shall be 18" unless otherwise noted on Drawings.

2.3 DUCTWORK

A. Comply with latest edition of SMACNA HVAC Duct Construction Standards, Metal and Flexible for acceptable materials, material thicknesses, and duct construction methods, unless otherwise indicated. Comply with NFPA 90A when ducts traverse through smoke zones.

B. Comply with UL 181 and California Energy Code Section 120.4 requirements for air distribution ducts and plenums.

C. Ducts shall be minimum 24 gauge thickness. Ducts shall be constructed for 2500 FPM maximum velocity and static pressure classes as follows:

1. Supply Ducts: +3 inch w.g.
2. Return Ducts: - 2 inch w.g.
3. Exhaust Ducts: -2 inch w.g.

D. Longitudinal seams: Groove and Pittsburgh lock seams and slip joints shall be used.

E. Duct Connections: Ductmate industries "Ductmate 35" and "Ductmate 45". Ductmate "Spiralmate" for round duct. Ductmate "Ovalmate" for oval duct.

F. Duct sealing shall be DP 1010 water based duct sealant or other equal and SMACNA approved foil-backed pressure sensitive tape or other equal.

G. Flexible ducts shall be UL 181 and Class I air duct in compliance with SMACNA HVAC Duct Construction Standards, Metal and Flexible, and NFPA 90A and 90B.

H. Flexible ducts shall be two-ply vinyl film supported by helically wound spring-steel wire, R4.2 fiberglass insulation, exterior reinforced laminated vapor barrier film. Duct shall be rated for +2 inch w.g., -1 inch w.g., 4000 FPM maximum velocity, and -10°F to +160°F. Flame Spread less than 25, Smoke Developed less than 50.

2.4 DUCTWORK CONNECTED TO FUME HOOD, LABORATORY, AND PROCESS AIR

A. Duct shall be PVC-coated, galvanized sheet steel with thicker coating on duct interior.

B. Pressure class: positive or negative 3-inch wg.

C. Ducts shall be airtight/watertight.

2.5 DUCT INSULATION AND LINING

A. All duct insulation and lining shall comply with California Energy Code Section 120.4 requirements for air distribution ducts and plenums.

B. Insulation shall conform to NFPA 90A and 90B, and UL 181, Class I. Insulation shall have Flame Spread not over 25 and Smoke Developed of not over 50.

C. Wherever external duct insulation is specified and internal acoustic treatment of equivalent insulating effect is also required by the Drawings or Specification for the same location, the external insulation may be omitted.

D. Acceptable Manufacturers: Johns Manville, Owens Corning or approved equal.

E. Acoustic Duct Liner: 1” thick, R4.2 in directly conditioned space and 2” thick, R8.0 in unconditioned space or outdoors. Owens Corning Quiet R, or approved equal.

F. Duct Insulation: 3” thick, R8.3 in unconditioned space and 1 1/2” thick, R4.2 for indirectly conditioned space. Owens Corning SoftR Ductwrap FRK, or approved equal.

G. Duct Insulation Outdoor: 2” thick rigid board fiberglass, R8.7 with 0.016 inch thick sheet Aluminum jacket.

2.6 REGISTERS, DIFFUSERS AND GRILLES

A. Acceptable manufacturers: Titus, Krueger.

B. Registers, diffusers, and grilles shall be as indicated on Drawings. Drawings and schedules indicate specific requirements of air inlets and air outlets. Other manufacturers’ products with equal quality, appearance, finish, and performance characteristics may be considered.

C. Registers shall have adjustable air pattern for setting in field to match field conditions. Redirect air pattern when required.

D. Refer to Architectural Drawings and Specifications for reflected ceiling plans, elevations, wall and ceiling type and construction. Coordinate frame and border types to accommodate the wall or ceiling specified or shown on the Architectural Drawings.

E. Registers, diffusers, and grilles in fire-rated ceilings or walls shall be all-steel construction.

2.7 DAMPERS AND DUCT ACCESSORIES

A. Acceptable manufacturers:

1. Dampers: Ruskin, Air Balance Inc, Pottorff, or approved equal.
2. Acutuators: Belimo, Honweywell, or approved equal.
3. Turning vanes: Ductmate industries, Duro Dyne, or approved equal.
4. Flexible connectors: Duro Dyne, Ventafabrics, or approved equal.
5. Duct access doors: Ductmate industries, Ward industries, or approved equal.
6. Backdraft dampers: Ruskin, Greenheck, Air Balance Inc, or approved equal.
7. Fire dampers: C&S Air products, or approved equal.

B. Provide volume dampers as specified or shown on the Drawings for proper balancing and distribution of air. Provide single blade dampers in ducts 24 inches in width or less, or 12 inches in height or less. Provide multiple blade, opposed blade design, dampers for all other duct sizes. Coordinate with the balancing contractor and provide additional dampers required for proper air balance.

C. Dampers shall be galvanized steel construction and shall be minimum 2 gauges thicker than duct gauge. Damper shall be pivoted to turn easily, provided with operating handles and locking devices mounted on the outside of the duct in an accessible location. Dampers shall be reinforced for rigidity.

D. Control dampers for outside air and return air shall be low-leakage with blade edge seals and jamb seals. Damper shall be AMCA licensed as a Class 1A damper.

E. Damper actuators for control dampers shall be modulating, 24V power supply, 0-10V DC control input, weatherproof construction.

F. Turning vanes shall comply with SMACNA HVAC Duct Construction Standards, Metal and Flexible for vanes and vane runners. Vane runners shall automatically align vanes.

G. Manufactured Turning Vanes: Fabricate 1 1/2” wide, double vane, curved blades of galvanized steel construction set to 3/4" o.c. Support with bars perpendicular to blades set 2” o.c. and set into vane runners suitable for duct mounting.

H. Flexible duct connectors shall be flame retardant fabrics, coatings, and adhesives complying with UL 181, Class I. Where exposed to weather, fabric shall be double coated with weatherproof, synthetic rubber resistant to UV rays.

I. Duct access doors shall be airtight and suitable for duct pressure class, constructed of galvanized steel with insulation fill as integral part of appropriate thickness. Include cam latches, sash locks, and hinges such that doors can easily be opened without tools. Seal around frame with neoprene or foam rubber.

J. Backdraft dampers shall be multi blade, parallel action gravity balanced, or adjustable counter-balance weighted dampers. Dampers shall have center pivoted blades of maximum 6” width, with sealed edges, assembled in rattle free manner with 90-degree stop. Provide with adjustment device to permit setting for varying differential static pressure.

K. Fire dampers shall be UL listed and conforming to NFPA 90A. Dampers shall be factory installed in sleeves. Dampers shall be arranged to close automatically upon operation of listed fusible link.

2.8 LOUVERS

A. Provide louvers complying with requirements specified, as demonstrated by testing manufacturer's stock units identical to those provided, except for length and width according to AMCA 500-L.

B. Verify actual dimensions of openings by field measurements before fabrication.

C. Louvers shall be fixed, formed-metal. Horizontal, drainable blade:

1. Acceptable Manufacturers: Airolite Company, Construction Specialties, Pottorff, Greenheck, or approved equal.
2. Louver Depth: 4 inches.
3. Frame and Blade Material and Nominal Thickness: Aluminum or Galvanized-steel sheet not less than 20 gage (0.0359 inch) for frames and 20 gage (0.0359 inch) for blades.
4. Mullion Type: Exposed.

D. Air Performance: Not more than 0.15 inch w.g. static pressure drop.

E. Fasteners: Use types and sizes to suit installation conditions.

F. AMCA Seal: Mark units with AMCA Certified Ratings Seal.

G. Provide bird screening at interior louver face.

1. Bird Screening: Aluminum or Galvanized steel, 0.5 inch square mesh, 0.041 inch wire.
2. Louver Screen Frames: Fabricated with mitered corners to louver sizes indicated. Non-rewirable, U-shaped frames with same kind and form of metal as indicated for louver. Same finish as louver.

2.9 HANGERS AND SUPPORTS

A. Subject to compliance with requirements, provide products by one of the following manufacturers or other approved equal:

1. B-Line.
2. Mason West.
3. Unistrut.
4. Power Strut.
5. Hilti.

B. Qualify welding processes and operators according to ASME Boiler and Pressure Vessel Code. Comply with AWS D1.1 procedures for field welding.

C. Duct attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.

2.10 SLEEVES

A. Construct sleeves for pipes passing through walls, floors, partitions, hung or furred ceilings, etc. of minimum 18 gage galvanized steel, flanges on each side of wall, partition, hung or furred ceiling, etc.

B. Provide standard weight galvanized steel pipe sleeves with welded anchor flanges at foundation walls and reinforced concrete or masonry walls.

C. Provide 20 gage galvanized sheet metal sleeves for round ductwork passing through masonry or concrete construction. Rectangular ductwork shall be provided with framed openings through floor and wall construction.

D. Install escutcheons at exposed piping through floors, ceilings, walls and partitions in finished areas, within cabinets and millwork, and piping through all fire-rated separations.

2.11 CONTROLS

A. Furnish and install programmable thermostats where indicated. Coordinate exact locations with Architect.

B. If indicated on Drawings, provide thermostats by specified manufacturer.

C. Thermostats shall comply with latest edition of California Energy Code for demand responsive capabilities and occupancy monitoring if required.

D. Mount thermostats 48 inches above finished floor.

E. Control wiring shall be installed per manufacturer's instructions and wiring diagrams. Wiring in walls and exposed spaces, including mechanical rooms, shall be in conduit and in accordance with Division 26. Wiring concealed above ceiling shall be plenum rated cable complying with NFPA 70.

F. Provide and install heavy duty lockable thermostat cover for assembly areas, gymnasiums, and any other public areas required by Owner.

2.12 PAINTING

A. See Division 09 for painting.

B. Prime and paint diffuser boot and duct interiors where visible through grilles with a matte black finish.

C. Prime and paint exposed ductwork, supports, and registers where required by the Architect.

D. Prime and paint louver or grille interiors where required by the Architect.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions for compliance with requirements for installation clearances, tolerances and other conditions affecting performance of work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 EQUIPMENT INSTALLATION

A. Equipment shall be installed level, on curbs or supports as required and/or indicated on Drawings and in accordance with manufacturer's instructions and recommendations.

B. Equipment shall be installed in locations shown and as complete assemblies with adequate service clearances for access and maintenance as required by codes and equipment installation manuals.

3.3 DUCTWORK INSTALLATION

A. All ductwork gauges, joints, reinforcing, and other details shall be in accordance with latest edition of SMACNA manuals unless otherwise specified.

B. Duct dimensions are net, inside, clear dimensions. For internally lined ducts, add lining thickness to determine metal duct dimensions.

C. Provide minimum 24-gauge sheet metal construction for ducts. Construct ducts with NFPA 90A gauges when traversing smoke zones.

D. Construct ducts of galvanized sheet metal, except where otherwise indicated or specified.

E. Construct all ductwork to dimensions indicated, straight and smooth on the inside with neatly finished joints lapped in direction of travel.

F. Construct all ductwork to avoid sharp duct edges. Edges shall be sufficiently rounded and where not possible, sharp edges shall be covered with edge protectors.

G. Fabricate changes in direction, both horizontal and vertical, to permit easy airflow.

H. At exposed duct penetrations of walls, floors and ceilings, provide sheet metal angle type escutcheons fastened to the duct only.

I. Duct Openings: Provide openings where required to accommodate thermometers, smoke detectors, controllers, wiring, conduit, tubing, etc. insert through air-tight rubber grommets.

J. Provide pitot tube openings where required for testing of systems. Include threaded metal cap, spring loaded cap or threaded plug to eliminate any air leakage. Coordinate locations of openings with balancing contractor.

K. Install ductwork to clear all obstructions, preserve headroom, and keep openings clear. Install exposed ducts as high as possible. Coordinate with other trades to maintain minimum 7'-6" clearance above finished floor, unless otherwise indicated.

L. Install ducts unless otherwise indicated, vertically or horizontally and parallel and perpendicular to building lines; avoid diagonal runs.

M. Coordinate layout with suspended ceiling, lighting layouts, and similar finished work.

N. Install dampers in branch duct for all air inlets and outlets at accessible location. Dampers shall be capable of adjustments and of being locked into position.

O. Use radius elbows in rectangular ductwork unless otherwise indicated. Centerline radius shall be a minimum 150 percent of duct width. Where space does not permit duct radius, install square elbow with turning vanes.

P. Ends of ducts shall turn over 3/4” for airtight connections between ducts and grilles. The ducts and grilles shall have separate sets of screws. Register frames and ends of ducts shall be properly placed before finishing is begun.

Q. All ducts shall be supported per SMACNA HVAC Duct Construction Standards. Supports and seismic bracing shall be in accordance with OSHPD Preapproval of Manufacturer’s Certification OPM-0295-13 and OPM-0052-13, and the California Building Code.

R. Ducts exposed to weather shall be completely waterproof with outdoor vapor barrier mastic over tape at all joints and seams. Slope entire top of duct down towards sides and coordinate duct slope with roof slope. Arrange standing seam, joints, and flanges to prevent accumulation, ponding or pooling of water.

S. Seal joints and seams of ductwork airtight to SMACNA seal classifications.

T. Protect all ductwork and interiors of ducts shall be clean and free from foreign materials until building is enclosed.

U. All ductwork and sealing shall comply with California Energy Code Section 120.4 requirements for Air Distribution System Ducts and Plenums.

3.4 DUCT SEALING

A. Duct systems shall be sealed to a leakage rate not to exceed 6 percent of the nominal air handler air flow rate.

B. Ductwork for constant volume systems that have more than 25 percent of the total duct surface area located outdoors or in unconditioned space shall have the duct leakage confirmed through HERS field verification and diagnostic testing.

C. New duct systems not subject to testing shall meet duct leakage requirements of CMC 603.9.2.

3.5 KITCHEN EXHAUST DUCTWORK INSTALLATION

A. Install ducts such that no grease will become pocketed in any portion of the ductwork.

B. Slope at no less than 1/4" per foot back to the hood or as required by the authority having jurisdiction.

C. Openings in ducts conform to the code requirements and shall be provided for complete and thorough cleaning of duct system.

D. Connect duct to hood, and other equipment indicated on Drawings.

3.6 FLEXIBLE DUCTWORK INSTALLATION

A. Flexible ductwork shall be installed with no runs of more than 5'-0" in length and shall be used only at register connections.

B. Flexible duct shall be installed in fully extended condition, free of sags and kinks, using only minimum length required to make connection. Bends greater than 90° are not allowed.

C. Flexible duct shall be full size of branch. Any change in size to match terminal connection shall be made at terminal. Connect to duct collars, terminal unit connections and air inlets and outlets per manufacturer's instructions.

D. All connections shall be sealed with high pressure duct sealer and secured with 3/8" nylon straps around inside liner of flexible duct.

E. Flexible ducts shall be supported at or near mid-length with 2" wide, 28 gauge steel hanger collar attached to the structure with an approved duct hanger. Installation shall minimize sharp radius turns or offsets.

3.7 DUCT INSULATION AND LINING INSTALLATION

A. Concealed ductwork shall be insulated with fiberglass ductwrap.

B. Provide acoustic lining where indicated on Drawings.

C. All supply and return ductwork shall be insulated, or acoustically lined on the inside when ductwork is exposed.

D. Exhaust duct need not be insulated. Outside air duct indoors need not be insulated. Outside air duct installed outdoors shall be insulated.

3.8 DUCT ACCESSORIES INSTALLATION

A. Flexible connections shall be installed on inlet and outlet duct connections of fans, air conditioning units, furnaces, and all other HVAC equipment. Fabric shall be of weight and strength for service required, properly fitted to render connection airtight. Fabric of sufficient width to provide minimum 4" between connected items.

B. Install backdraft dampers on exhaust fans or exhaust ducts nearest to outside and where indicated. Install backdraft dampers at roof hoods or louvers connected to ductwork.

C. Install duct access doors to allow for inspecting, adjusting, and maintaining accessories and terminal units. Access doors shall be large enough for maintenance.

3.9 REGISTERS, DIFFUSERS, AND GRILLES INSTALLATION

A. Locations indicated on the Architectural Drawings shall take precedence. For lay-in ceiling panels, locate in the center of the panel. Where architectural features or other items conflict with installation, notify Architect for a determination of final location.

B. Install with airtight connection to ducts and to allow service and maintenance of dampers, air extractors, and fire dampers.

C. After installation of diffusers, registers, and grilles, inspect exposed finish. Clean exposed surfaces to remove burrs, dirt, and smudges. Replace diffusers, registers, and grilles that have damaged finishes.

D. Install diffusers, registers, and grilles level and plumb, according to manufacturer's written instructions.

E. All visible interior surfaces of registers, diffusers, and grilles shall be painted flat black.

F. All visible exterior surfaces of registers, diffusers, and grilles shall be factory off-white finish as standard. Where required by Architect, provide in a color as selected by Architect or provide prime-painted for field painting.

3.10 FLUE VENT AND COMBUSTION AIR INTAKE INSTALLATION

A. Install all required flues and combustion air intake at gas fired equipment in accordance with manufacturer's instructions and applicable codes.

B. Comply with minimum clearances from combustibles and minimum termination heights according to product listing, NFPA, or local codes; whichever is most stringent.

C. Support at intervals recommended by manufacturer to support weight of pipe and all accessories.

D. Seal between sections according to manufacturer's written instructions using sealant recommended by manufacturer.

E. After completing installation, inspect finish. Remove burrs, dirt, and construction debris. Repair damaged finished.

3.11 LOUVERS INSTALLATION

A. Assemble louvers in factory to minimize field splicing and assembly. Disassemble units as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

B. Maintain equal louver blade spacing to produce uniform appearance.

C. Comply with SMACNA's Architectural Sheet Metal Manual for fabrication, construction details, and installation procedures.

D. Locate and place louvers level, plumb, and at indicated alignment with adjacent work.

E. Use concealed anchorages where possible.

F. Form closely fitted joints with exposed connections accurately located and secured.

G. Protect unpainted galvanized and nonferrous metal surfaces that will be in contact with concrete, masonry, or dissimilar metals from corrosion and galvanic action by applying a heavy coating of bituminous paint or by separating surfaces with waterproof gaskets or nonmetallic flashing.

H. Install concealed gaskets, flashings, joint fillers, and insulation as louver installation progresses where watertight louver joints are required.

3.12 HANGERS AND SUPPORTS INSTALLATION

A. All equipment, plenums, registers, ductwork, and piping shall be securely anchored to building structure and seismically braced as required by the Drawings and Specifications. Comply with OSHPD Preapproval of Manufacturer's Certification OPM-0295-13 and OPM-0052-13, and the California Building Code.

B. Comply with SMACNA HVAC Duct Construction Standards – Metal and Flexible for hanger rod or sheet metal strap sizes and spacing for duct supports.

C. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories.

D. Install lateral bracing with pipe hangers and supports to prevent swaying.

E. Install hangers and supports so piping live and dead loads and stresses from movement will not be transmitted to connected equipment.

F. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.

G. Install hangers and supports to provide indicated pipe slopes.

H. Adjust hangers to distribute loads equally on attachments.

I. Trim excess length of continuous-thread hanger and support rods to 1 1/2 inches.

J. Perform all welding in accordance with standards of the American Welding Society. Clean surfaces of loose scale, rust, paint or other foreign matter and properly align before welding. Use wire brush on welds after welding.

3.13 TESTING

A. Comply with more stringent of system manufacturer's requirements and requirement indicated herein.

B. Provide the Architect with certified copies of the test results in written format. At a minimum include the date of the test, witnesses present, sections tested, length of tests, starting and final pressures.

C. After completion of refrigerant piping installation, pressurize piping systems to a test pressure of not less than 600 psig using dry nitrogen.

D. Successful testing shall maintain the test pressure for a continuous and uninterrupted period of 24 hours.

E. After completion of pressure testing evacuate piping systems using a vacuum pump with a check valve. Maintain test pressure per manufacturer's requirements for a continuous and uninterrupted period of one (1) hour.

F. Prepare and submit test reports to the Architect for project record.

G. Charge the refrigerant piping system following system manufacturer's written instructions. Total refrigerant charge shall be recorded and permanently displayed at the system's outdoor unit.

3.14 ADJUSTING

A. Adjust equipment and components to function smoothly, and lubricate as recommended by manufacturer.

B. Adjust initial temperature setpoints. Adjust initial airflow settings and discharge airflow patterns.

C. Set field adjustable switches and circuit breaker trip ranges according to manufacturer's written instructions.

3.15 FIELD QUALITY CONTROL

A. Engage a factory authorized service representative to inspect field assembled components and equipment installation, including piping and electrical connections. Provide a written report of inspection to the Architect.

B. Engage a factory authorized service representative to perform startup service. Complete installation and startup checks according to manufacturer's written instructions. Provide completed startup sheets for each piece of equipment to the Architect.

3.16 TRAINING AND O&MS

A. Refer to Section 23 00 00 Mechanical General Requirements and Division 01 for Training requirements, Operating and Maintenance Manuals, and other Closeout procedures.

END OF SECTION

SECTION 260500 - GENERAL ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.01 Description of Work:

A. The work of this Section consists of providing all required labor, supervision, materials and equipment to satisfactorily complete all electrical installations that are shown on the Drawings, included in these specifications, or otherwise needed for a complete and fully operating facility.

B. Furnish and install all required in-place equipment, conduits, conductors, cables and any miscellaneous materials for the satisfactory interconnection and operation of all associated electrical systems.

1.02 Related Work:

A. This Section provides the basic Electrical Requirements which supplement the General Requirements per architectural directions and apply to all Sections of Division 26.

1.03 Submittals:

A. As specified per architectural directions. Submit to the Architect shop drawings, manufacturer's data and certificates for equipment, materials and finish, and pertinent details for each system specified. Information to be submitted includes manufacturer's descriptive literature of cataloged products, equipment, drawings, diagrams, performance and characteristic curves as applicable, test data and catalog cuts. Obtain written approval before procurement, fabrication, or delivery of the items to the job site. Partial submittals are not acceptable and will be returned without review. Furnish manufacturer's name, trade name, catalog model or number, nameplate data, size, layout dimensions, capacity, project specification and paragraph reference, applicable Federal, Industry and Technical Society Publication References, and years of satisfactory service of each item required to establish contract compliance. Photographs of existing installations and data submitted in lieu of catalog data are not acceptable and will be returned without approval.

B. Organize submittals for equipment and items related to each specification section together as a package.

C. Proposed substitutions of products will not be reviewed or approved prior to awarding of the Contract.

D. Substitutions shall be proven to the Architect or Engineer to be equal or superior to the specified product. Architect’s decision is final. The Contractor shall pay all costs incurred by the Architect and Engineer in reviewing and processing any proposed substitutions whether or not a proposed substitution is accepted.

E. If a proposed substitution is rejected, the contractor shall furnish the specified product at no increase in contract price.

F. If a proposed substitution is accepted, the contractor shall be completely responsible for all dimensional changes, electrical changes, or changes to other work which are a result of the substitution. The accepted substitution shall be made at no additional cost to the owner or design consultants.

1.04 Quality Assurance:

A. Codes: All electrical equipment and materials, including installation and testing, shall conform to the latest editions following applicable codes:

1. California Electrical Code (CEC).

2. Occupational Safety and Health Act (OSHA) standards.

3. All applicable local codes, rules and regulations.

4. Electrical Contractor shall possess a C-10 license and all other licenses as may be required. Licenses shall be in effect at start of this contract and be maintained throughout the duration of this contract.

B. Variances: In instances where two or more codes are at variance, the most restrictive requirement shall apply.

C. Standards: Equipment shall conform to applicable standards of American National Standards Institute (ANSI), Electronics Industries Association (EIA), Institute of Electrical and Electronics Engineers (IEEE), and National Electrical Manufacturers Association (NEMA).

D. Underwriter Laboratories (UL) listing is required for all equipment and materials where such listing is offered by the Underwriters Laboratories. Provide service entrance labels for all equipment required by the NEC to have such labels.

E. The electrical contractor shall guarantee all work and materials installed under this contract for a period of one (1) year from date of acceptance by owner.

F. All work and materials covered by this specification shall be subject to inspection at any and all times by representatives of the owner. Work shall not be closed in or covered before inspection and approval by the owner or his representative. Any material found not conforming with these specifications shall, within 3 days after being notified by the owner, be removed from premises; if said material has been installed, entire expense of removing and replacing same, including any cutting and patching that may be necessary, shall be borne by the contractor.

1.05 Contract Documents:

A. Drawings and Specifications:

1. In the case of conflict between the drawings and specifications, the specifications shall take precedence.

2. Drawings and specifications are intended to comply with all law, ordinances, rules and regulations of constituted authorities having jurisdiction, and where referred to in the Contract Documents, said laws, ordinance, rules and regulations shall be considered as a part of said Contract Documents within the limits specified. The Contractor shall bear all expenses of correcting work done contrary to said laws, ordinance, rules and regulations if the Contractor knew or should have known that the work as performed is contrary to said laws, ordinances, rules and regulations and if the Contractor performed same (1) without first consulting the Architect for further instructions regarding said work and/or (2) disregarded the Architect's instructions regarding said work.

B. Drawings: The Electrical Drawings shall govern the general layout of the completed construction.

1. Locations of equipment, panels, pullboxes, conduits, stub-ups, ground connections are approximate unless dimensioned; verify locations with the Architect prior to installation.

2. Review the Drawings and Specification Divisions of other trades and perform the electrical work that will be required for those installations.

3. Should there be a need to deviate from the Electrical Drawings and Specifications, submit written details and reasons for all changes to the Architect for approval.

4. The general arrangement and location of existing conduits, piping, apparatus, etc., is approximate. The drawings and specifications are for the assistance and guidance of the contractor, exact locations, distances and elevations are governed by actual field conditions. Accuracy of data given herein and on the drawings is not guaranteed. Minor changes may be necessary to accommodate work. The contractor is responsible for verifying existing conditions. Should it be necessary to deviate from the design due to interference with existing conditions or work in progress, claims for additional compensation shall be limited to those for work required by unforeseen conditions as determined by the Architect.

5. All drawings and divisions of these specifications shall be considered as whole. The contractor shall report any apparent discrepancies to the Architect prior to submitting bids.

6. The contractor shall be held responsible to have examined the site and compared it with the specifications and plans and to have satisfied himself as to the conditions under which the work is to be performed. He shall be held responsible for knowledge of all existing conditions whether or not accurately described. No subsequent allowance shall be made for any extra expense due to failure to make such examination.

1.06 Closeout Submittals:

A. Manuals: Furnish manuals for equipment where manuals are specified in the equipment specifications or are specified per architectural directions.

1.07 Coordination:

A. Coordinate the electrical work with the other trades, code authorities, utilities and the Architect.

B. Provide and install all trenching, backfilling, conduit, pull boxes, splice boxes, etc. for all services to the locations indicated on the Drawings.

C. Contractor shall pay all inspection and other applicable fees and procure all permits necessary for the completion of this work.

D. Where connections must be made to existing installations, properly schedule all the required work, including the power shutdown periods.

E. When two trades join together in an area, make certain that no electrical work is omitted.

1.08 Job Conditions:

A. Operations: Perform all work in compliance with architectural requirements.

1. Keep the number and duration of power shutdown periods to a minimum.

2. Show all proposed shutdowns and their expected duration on the construction schedule. Schedule and carry out shutdowns so as to cause the least disruption to operation of the Owner's facilities.

3. Carry out shutdown only after the schedule has been approved, in writing, by the owner. Submit power interruption schedule 15 days prior to date of interruption.

B. Construction Power: Unless otherwise noted per architectural directions of these specifications, contractor shall make all arrangements and provide all necessary facilities for temporary construction power from the owner’s on-site source. Energy costs shall be paid for by the Owner.

C. Storage: Provide adequate storage for all equipment and materials which will become part of the completed facility so that it is protected from weather, dust, water, or construction operations.

1.09 Damaged Products:

A. Notify the Architect in writing in the event that any equipment or material is damaged. Obtain approval from the Architect before making repairs to damaged products.

1.10 Locations:

A. General: Use equipment, materials and wiring methods suitable for the types of locations in which they are located.

B. Dry Locations: All those indoor areas which do not fall within the definition below for Wet Locations and which are not otherwise designated on the Drawings.

C. Wet Locations: All locations exposed to the weather, whether under a roof or not, unless otherwise designated on the Drawings.

1.11 Safety and Indemnity:

A. The Contractor is solely and completely responsible for conditions of the job site including safety of all persons and property during performance of the work. This requirement will apply continually and not be limited to normal working hours. The contractor shall provide and maintain throughout the work site proper safeguards including, but not limited to, enclosures, barriers, warning signs, lights, etc. to prevent accidental injury to people or damage to property.

B. No act, service, drawing review or construction review by the Owner, the Engineer or their Consultants is intended to include reviews of the adequacy of the Contractors safety measures in or near the construction site.

C. The Contractor performing work under this Division of the Specifications shall hold harmless, indemnify, and defend the Owner, the Engineer, their consultants, and each of their officers, agents and employees from any and all liability claims, losses, or damage arising out of or alleged to arise from bodily injury, sickness, or death of a person or persons and for all damages arising out of injury to or destruction of property arising directly or indirectly out of or in connection with the performance of the work under this Division of the Specifications, and from the Contractor's negligence in the performance of the work described in the construction contract documents, but not including liability that may be due to the sole negligence of the Owner, the Engineer, their Consultants or their officers, agents and employees.

D. If a work area is encountered that contains hazardous materials, the contractor is advised to coordinate with the owner and it's abatement consultant for abatement of hazardous material by the Owner’s Representative. “Hazardous materials” means any toxic substance regulated or controlled by OSHA, EPA, State of California or local rules, regulations and laws. Nothing herein shall be construed to create a liability for Aurum Consulting Engineers regarding hazardous materials abatement measures, or discovery of hazardous materials.

1.12 Access Doors:

A. The contractor shall install access panels as required where floors, walls or ceilings must be penetrated for access to electrical, control, fire alarm or other specified electrical devices. The minimum size panel shall be 14” x 14” in usable opening. Where access by a service person is required, minimum usable opening shall be 18” x 24”.

B. All access doors installed lower than 7’-0” above finished floor and exposed to public access shall have keyed locks.

C. Where specific information or details relating to access panels differ from Division 26 paragraph 1.12 of these specifications, or shown on the electrical drawings and details or under other Divisions of work, those requirements shall supersede these specifications.

1.13 Arc Flash:

A. The contractor shall install a clearly visible arc flash warning to the inside door of all panelboards and industrial control panels, as well as to the front of all switchboards and motor control centers that are a part of this project.

B. The warning shall have the following wording: line 1 “WARNING” (in large letters), line 2 “Potential Arc Flash Hazard” (in medium letters), line 3 & 4 “Appropriate Personal Protective Equipment and Tools required when working on this equipment”.

1.14 Emergency Boxes:

A. All boxes and enclosures for emergency circuits shall be permanently marked with a readily visible red spray-painted mark.

PART 2 - PRODUCTS

2.01 Standard of Quality:

A. Products that are specified by manufacturer, trade name or catalog number establish a standard of quality and do not prohibit the use of equal products of other manufacturers provided they are established to be equal to the specified product and approved by the Architect prior to installation.

B. Material and Equipment: Provide materials and equipment that are new and are current products of manufacturers regularly engaged in the production of such products. The standard products shall have been in satisfactory commercial or industrial use for two years prior to bid opening. The two-year period includes use of equipment and materials of similar size under similar circumstances. For uniformity, only one manufacturer will be accepted for each type of product.

C. Service Support: Submit a certified list of qualified permanent service organizations including their addresses and qualification for support of the equipment. These service organizations shall be convenient to the equipment installation and able to render service to the equipment on a regular and emergency basis during the warranty period of the contract.

D. Manufacturer's Recommendations: Where installation procedures are required to be in accordance with manufacturer's recommendations, furnish printed copies of the recommendations prior to installation. Installation of the item shall not proceed until recommendations are received. Failure to furnish recommendation shall be cause for rejection of the equipment or material.

2.02 Nameplates:

A. For each piece of electrical equipment, provide a manufacturer's nameplate showing his name, location, the pertinent ratings, the model designation, and shop order number.

B. Identify each piece of equipment and related controls with a rigid laminated engraved plastic nameplate. Unless otherwise noted, nameplates shall be melamine plastic 0.125-inch-thick, white with black center core. Surface shall be matte finish. Corners shall be square.

Accurately align lettering and engrave into the core. Minimum size of nameplates shall be 0.5 by 2.5 inches unless otherwise noted. Where not otherwise specified, lettering shall be a minimum of 0.25-inch-high normal block style. Engrave nameplates with the inscriptions indicated on the Drawings and, if not so indicated, with the equipment name. Securely fasten nameplates in place using two stainless steel or brass screws.

2.03 Fasteners:

A. Fasteners for securing equipment to walls, floors and the like shall be either hot-dip galvanized after fabrication or stainless steel.

2.04 Finish requirements:

A. Equipment: Refer to each electrical equipment section of these Specifications for painting requirements of equipment enclosures. Repair any final paint finish which has been damaged or is otherwise unsatisfactory, to the satisfaction of the Architect.

B. Wiring System: In finished areas, paint all exposed conduits, boxes and fittings to match the color of the surface to which they are affixed.

PART 3 - EXECUTION

3.01 Workmanship:

A. Ensure that all equipment and materials fit properly in their installation.
B. Perform any required work to correct improperly fit installation at no additional expense to the owner.

C. All electrical equipment and materials shall be installed in a neat and workmanship manner in accordance with the "NECA-1 Standard Practices for Good Workmanship in Electrical Contracting". Workmanship of the entire job shall be first class in every respect.

3.02 Equipment Installations:

A. Provide the required inserts, bolts and anchors, and securely attach all equipment and materials to their supports.

B. Do all the cutting and patching necessary for the proper installation of work and repair any damage done.

C. Earthquake restraints: all electrical equipment, including conduits over 2 inches in diameter, shall be braced or anchored to resist a horizontal force acting in any direction as per CBC Section 1616A Title 24, part 2, and ASCE7-10, Section 13.3 and 13.6 and Table 13.6-1.

D. Structural work: All core drilling, bolt anchor insertion, or cutting of existing structural concrete shall be approved by a California registered structural consulting engineer prior to the execution of any construction. At all floor slabs and structural concrete walls to be drilled, cut or bolt anchors inserted, the contractor shall find and mark all reinforcing in both faces located

by means of x-ray, pach-ometer, or prof-ometer. Submit sketch showing location of rebar and proposed cuts, cores, or bolt anchor locations for approval.

3.03 Field Test:

A. Test shall be in accordance with Acceptance testing specifications issued by the National Electrical Testing Association (NETA).

B. Perform equipment field tests and adjustments. Properly calibrate, adjust and operationally check all circuits and components, and demonstrate as ready for service. Make additional calibration and adjustments if it is determined later that the initial adjustments are not satisfactory for proper performance. Perform equipment field test for equipment where equipment field tests are specified in the equipment Specifications. Give sufficient notice to the Architect prior to any test so that the tests may witnessed.

C. Provide instruments, other equipment and material required for the tests. These shall be of the type designed for the type of tests to be performed. Test instrument shall be calibrated by a recognized testing laboratory within three months prior to performing tests.

D. Operational Tests: Operationally test all circuits to demonstrate that the circuits and equipment have been properly installed and adjusted and are ready for full-time service. Demonstrate the proper functioning of circuits in all modes of operation, including alarm conditions.

E. Re-testing will be required for all unsatisfactory tests after the equipment or system has been repaired. Re-test all related equipment and systems if required by the Architect. Repair and re-test equipment and systems which have been satisfactorily tested but later fail, until satisfactory performance is obtained.

F. Maintain records of each test and submit five copies to the Architect when testing is complete. All tests shall be witnessed by the Architect. These records shall include:

1. Name of equipment tested.

2. Date of report.

3. Date of test.

4. Description of test setup.

5. Identification and rating of test equipment.

6. Test results and data.

7. Name of person performing test.

8. Owner or Architect's initials.

G. Items requiring testing shall be as noted in the additional electrical sections of these specifications.

3.04 Cleaning Equipment:

A. Thoroughly clean all soiled surfaces of installed equipment and materials.

3.05 Painting of Equipment:

A. Factory Applied: Electrical equipment shall have factory applied painting system which shall, as a minimum, meet the requirements of NEMA ICS 6 corrosion-resistance test and the additional requirements specified in the technical section.
B. Field Applied: Paint electrical equipment as required to match finish of adjacent surfaces.

3.06 Records:

A. Maintain one copy of the contract Drawing Sheets on the site of the work for recording the "as built" condition. After completion of the work, the Contractor shall carefully mark the work as actually constructed, revising, deleting and adding to the Drawing Sheets as required. The following requirements shall be complied with:

1. Cable Size and Type: Provide the size and type of each cable installed on project.

2. Substructure: Where the location of all underground conduits, pull boxes, stub ups and etc. where are found to different than shown, carefully mark the correct location on the Drawings. Work shall be dimensioned from existing improvements.

3. Size of all conduit runs.

4. Routes of concealed conduit runs and conduit runs below grade.

5. Homerun points of all branch circuit.

6. Location of all switchgear, panels, MCC, lighting control panels, pullcans, etc.

7. Changes made as a result of all approved change orders, addendums, or field authorized revisions.

8. As Built: At the completion of the Work the Contractor shall review, certify, correct and turn over the marked-up Drawings to the Architect for his use in preparing "as built" plans.

9. As built Drawings shall be delivered to the Architect within ten (10) days of completion of construction.

3.07 Clean Up:

A. Upon completion of electrical work, remove all surplus materials, rubbish, and debris that accumulated during the construction work. Leave the entire area neat, clean, and acceptable to the Architect.

3.08 Mechanical and Plumbing Electrical Work:

A. The requirements for electrical power and/or devices for all mechanical and plumbing equipment supplied and/or installed under this Contract shall be coordinated and verified with the following:

1. Mechanical and Plumbing Drawings.
2. Mechanical and Plumbing sections of these Specifications.
3. Manufacturers of the Mechanical and Plumbing equipment supplied.

B. The coordination and verification shall include the voltage, ampacity, phase, location and type of disconnect, control, and connection required. Any changes that are required as a result of this coordination and verification shall be a part of this Contract.

C. The Electrical Contractor shall furnish and install the following for all mechanical and plumbing equipment:

1. Line voltage conduit and wiring.
2. Disconnect switches.
3. Manual line motor starters.

D. Automatic line voltage controls and magnetic starters shall be furnished by the Mechanical and/or Plumbing Contractor and installed and connected by the Electrical Contractor. When subcontracted for by the Mechanical and/or Plumbing Contractor, all line voltage control wiring installed by the Electrical Contractor shall be done per directions from the Mechanical and/or Plumbing Contractor.

E. All low voltage control wiring for Mechanical and Plumbing equipment shall be installed in conduit. Furnishing, installation and connection of all low voltage conduit, boxes, wiring and controls shall be by the Mechanical and/or Plumbing Contractor.

F. Disconnects (Motor and Circuit)

1. Disconnect switches shall be as manufactured by ITE- Siemens, General Electric or Square D.

G. Disconnects (Motor: Fused):

1. Disconnect switches shall be provided and located at all motors.
2. Switches for three-phase motors shall be heavy-duty, horsepower rated three-pole, and surface mounted except as noted on drawings.
3. Switches containing more than three poles shall be as specified on the drawings.
4. Switches for single-phase, fractional horsepower motors shall be heavy-duty, horsepower rated.

5. Switches shall be horsepower rated.

H. Manual motor starters, where required, shall have toggle type operators with pilot light and melting alloy type overload relays, SQUARE D COMPANY, Class 2510, Type FG-1P (surface) or Type FS-1P (flush) or ITE, WESTINGHOUSE or GENERAL ELECTRIC equal.

END OF SECTION 260500

SECTION 260519 - LINE VOLTAGE WIRE AND CABLE

PART 1 - GENERAL

1.01 Description of Work:

A. The work of this Section consists of providing all wire and cable rated 600 volts or less, including splices and terminations, as shown on the Drawings and as described herein.

1.02 Related Work:

A. See the following Specification Section for work related to the work in this Section:

1. 260542 Conduits, Raceways and Fittings.

2. 260533 Junction and Pull Boxes.

1.03 Quality Assurance

A. Field tests shall be performed as specified in paragraph 3.04 of this Section.

PART 2 - PRODUCTS

2.01 Conductors:

A. Conductors shall be copper, type THHN/THWN/MTW oil and gasoline resistant, 600 volt rated insulation.

B. Conductors shall be stranded copper.

C. Minimum power and control wire size shall be No. 12 AWG unless otherwise noted.

D. All conductors used on this Project shall be of the same type and conductor material.

2.02 Cables:

A. All individual conductors shall be copper with type THHN/THWN, 600 volt rated insulation.

D. Insulation Marking - All insulated conductors shall be identified with printing colored to contrast with the insulation color.

E. Color Coding - As specified in paragraph 3.03.

F. Special Wiring - Where special wiring is proposed by an equipment manufacturer, submit the special wiring requirements to the Owner's Representative and, if approved, provide same. Special wire shall be the type required by the equipment manufacturer.

G. Other Wiring - Wire or cable not specifically shown on the Drawings or specified, but required, shall be of the type and size required for the application and as approved by the Owner's Representative.

H. Manufacturer - Acceptable manufacturers including Cablec, Southwire, or equal.

2.03 Terminations:

A. Manufacturer - Terminals as manufactured by T&B, Burndy or equal.

B. Wire Terminations – Stranded conductors shall be terminated in clamping type terminations which serve to contain all the strands of the conductor. Curling of a stranded conductor around a screw type terminal is not allowed. For screw type terminations, use a fork type stake-on termination on the stranded conductor. Use only a stake-on tool approved for the fork terminals selected.

C. End Seals - Heat shrink plastic caps of proper size for the wire on which used.

2.04 Tape:

A. Tape used for terminations and cable marking shall be compatible with the insulation and jacket of the cable and shall be of plastic material.

PART 3 - EXECUTION

3.01 Cable Installation:

A. Clean Raceways - Clean all raceways prior to installation of cables as specified in Section 260542 - Conduits Raceway and Fittings.

B. All line voltage wiring shall be installed in conduit.

C. All feeder conductors shall be continuous from equipment to equipment. Splices in feeders are not permitted unless specifically noted or approved by the Electrical Engineer.

D. All branch circuit wiring shall be run concealed in ceiling spaces, walls, below floors or in crawl spaces unless noted otherwise.

E. Cable Pulling - Exercise care in pulling wires and cables into conduit or wireways so as to avoid kinking, putting undue stress on the cables or otherwise abrading them. No grease will be permitted in pulling cables. Only soapstone, talc, or UL listed pulling compound will be permitted. The raceway construction shall be complete and protected from the weather before cable is pulled into it. Swab conduits before installing cables and exercise care in pulling, to avoid damage to conductors.

F. Bending Radius - Cable bending radius shall be per applicable code. Install feeder cables in one continuous length.

G. Equipment Grounding Conductors - Provide an equipment grounding conductor, whether or not it is shown on the Drawings, in all conduits or all raceways.

H. Panelboard Wiring - In panels, bundle incoming wire and cables which are No. 6 AWG and smaller, lace at intervals not greater than 6 inches, neatly spread into trees and connect to their respective terminals. Allow sufficient slack in cables for alterations in terminal connections. Perform lacing with plastic cable ties or linen lacing twine. Where plastic panel wiring duct is provided for cable runs, lacing is not necessary when the cable is properly installed in the duct.

3.02 Cable Terminations and Splices:

A. Splices - UL Listed wirenuts.

B. Terminations - Shall comply with the following:

1. Make up and form cable and orient terminals to minimize cable strain and stress on device being terminated on.

2. Burnish oxide from conductor prior to inserting in oxide breaking compound filled terminal.

3.03 Circuit and Conductor Identification:

A. Color Coding - Provide color coding for all circuit conductors. Insulation color shall be white for neutrals and green for grounding conductors. Conductor colors shall be as follows:

VOLTAGE	208/120V	480/277V
Phase A	Black	Brown
Phase B	Red	Orange
Phase C	Blue	Yellow
Neutral	White	Grey
Ground	Green	Green

B. Color coding shall be in the conductor insulation for all conductors #10 AWG and smaller; for larger conductors, color shall be either in the insulation or in colored plastic tape applied at every location where the conductor is readily accessible.

C. Circuit Identification - All underground distribution and service circuits shall be provided with plastic identification tags in each secondary box and at each termination. Tags shall identify the source transformer of the circuit and the building number(s) serviced by the circuit.

3.04 Field Tests:

A. All systems shall test free from short circuits and grounds, shall be free from mechanical and electrical defects, and shall show an insulation resistance between phase conductors and ground of not less than the requirements of the CEC. All circuits shall be tested for proper neutral connections.

B. Insulation Resistance Tests: Perform insulation resistance tests on circuits with #2 AWG and larger conductors to be energized with a line-to-neutral voltage of 120 volts or more. Make these tests before all equipment has been connected. Test the insulation with a 500Vdc insulation resistance tester with a scale reading 100 megohms. The insulation resistance shall be 2 megohms or more. Submit results for review.

END OF SECTION 260519

SECTION 260526 - GROUNDING

PART 1 GENERAL

1.1 Section Includes:

A. Conduits, wires, ground rods and other materials for the electrical grounding system.

1.2 Related Sections:

A. Section 260500 - Electrical General Requirements.

PART 2 PRODUCTS

2.1 Ground Rod:

A. "Copperweld" ground rod conforming to or exceeding requirements of U.L. Specification No. 467 (ANSI C-33.8). Rod shall be 3/4" diameter and 10' in length, unless otherwise noted on the Drawings.

2.2 Below Grade Connections:

A. Compression fittings, Thomas & Betts, Series 52000, 53000 or 54000 or approved equal.

2.3 Hardware:

A. Bolts, nuts and washers shall be bronze, cadmium plated steel or other non-corrosive materials, approved for the purpose.

2.4 Waterproof Sealant:

A. Use Kearney "Aqua Seal" mastic sealant on all below grade clamp or compression type connections.

PART 3 EXECUTION

3.1 Grounding and Bonding:

A. Grounding and bonding shall be as required by codes and local authorities.

B. All electrical equipment shall be grounded, including, but not limited to, panel boards, terminal cabinets and outlet boxes.

C. The ground pole of receptacles shall be connected to their outlet boxes by means of a copper ground wire connecting to a screw in the back of the box.

D. A green insulated copper ground wire, sized to comply with codes, shall be installed in all conduit runs.

E. All metal parts of pull boxes shall be grounded per code requirements.

F. All ground conductors shall be green insulated copper.

G. The ground system electrodes shall be tested for resistance before the equipment ground conductors are connected. Maximum ground system resistance shall be 25 ohms. Install up to two additional ground rods to meet the 25-ohm requirement. Multiple ground rods shall not be less than 10 feet apart.

H. Grounding of the panels [,] [and] buildings [and relocatable]. shall be completed as indicated on the Drawings.

END OF SECTION 260526

SECTION 260533 - OUTLET, JUNCTION AND PULL BOXES

PART 1 - GENERAL

1.1 Description of Work:

A. The work of this Section consists of providing all required labor, supervision, materials and equipment to satisfactorily complete all electrical installations shown on the drawings, included in these Specification, or otherwise needed for a complete and fully operating facility. The work shall include but not be limited to the following:

B. Furnish and install all required material, supports and miscellaneous material for the satisfactory interconnection of all associated electrical systems.

1.2 Related Work:

A. See the following specification sections for work related to the work of this section.

1. 260500 General Electrical Requirements.

2. 260542 Conduits, Raceway and Fittings.

3. 260519 Line Voltage Wire and Cable.

PART 2 - PRODUCTS

2.1 Outlet boxes, Junction and Pull boxes

A. Standard Outlet Boxes: Galvanized, steel, knock-out type of size and configuration best suited to the application indicated on the Drawings. Minimum box size shall be 4 inches square (octagon for most light fixtures) by 1-1/2 inches deep with mud rings as required.

B. Switch boxes: Minimum box size shall be 4 inches square by 1-1/2 inches deep with mud rings as required. Install multiple switches in standard gang boxes with raised device covers suitable for the application indicated.

C. Conduit bodies: Cadmium plated, cast iron alloy. Conduit bodies with threaded conduit hubs and neoprene gasketed, cast iron covers. Bodies shall be used to facilitate pulling of conductors or to make changes in conduit direction only. Splices are not permitted in conduit bodies. Crouse-Hinds Form 8 Condulets, Appleton Form 35 Unilets or equal.

D. Sheet Metal Boxes: Use standard outlet or concrete ring boxes wherever possible; otherwise use a minimum 16-gauge galvanized sheet metal, NEMA I box sized to Code requirements with covers secured by cadmium plated machine screws located six inches on centers. Circle AW Products, Hoffman Engineering Company or equal.

E. Flush Mounted Pull boxes and Junction boxes: Provide overlapping covers with flush head cover retaining screws, prime coated.

PART 3 - EXECUTION

3.1 Outlet Boxes

A. General:

1. All outlet boxes shall finish flush with building walls, ceilings and floors except in mechanical and electrical rooms above accessible ceiling or where exposed work is called for on the Drawings.

2. Install raised device covers (plaster rings) on all switch and receptacle outlet boxes installed in masonry or stud walls or in furred, suspended or exposed concrete ceilings. Covers shall be of a depth to suit the wall or ceiling finish.

3. Leave no unused openings in any box. Install close-up plugs as required to seal openings.

B. Box Layout:

1. Outlet boxes shall be installed at the locations and elevations shown on the drawings or specified herein. Make adjustments to locations as required by structural conditions and to suit coordination requirements of other trades.

2. Locate switch outlet boxes on the latch side of doorways.

3. Outlet boxes shall not be installed back to back nor shall through-wall boxes be permitted. Outlet boxes on opposite sides of a common wall shall be separated horizontally by at least one stud or vertical structural member.

4. For outlets mounted above counters, benches or backsplashes, coordinate location and mounting heights with built-in units. Adjust mounting height to agree with required location for equipment served.

5. On fire rated walls, the total face area of the outlet boxes shall not exceed 100 square inches per 100 square feet of wall area.

C. Supports:

1. Outlet Boxes installed in metal stud walls shall be equipped with brackets designed for attaching directly to the studs or shall be mounted on specified box supports.

2. Fixture outlet boxes installed in suspended ceiling of gypsum board or lath and plaster construction shall be mounted to 16-gauge metal channel bars attached to main ceiling runners.

3. Fixture outlet boxes installed in suspended ceilings supporting acoustical tiles or panels shall be supported directly from the structure above where pendant mounted lighting fixture are to be installed on the box.

4. Fixture Boxes above tile ceilings having exposed suspension systems shall be supported directly from the structure above.

5. Outlet and / or junction boxes shall not be supported by grid or fixture hanger wires at any locations.

3.2 Junction and Pull Boxes

A. General:

1. Install junction or pull boxes where required to limit bends in conduit runs to not more than 360 degrees or where pulling tension achieved would exceed the maximum allowable for the cable to be installed. Note that these boxes are not shown on the Drawings.

2. Locate pull boxes and junction boxes in concealed locations above accessible ceilings or exposed in electrical rooms, utility rooms or storage areas.

3. Install raised covers (plaster rings) on boxes in stud walls or in furred, suspended or exposed concrete ceilings. Covers shall be of a depth to suit the wall or ceiling finish.

4. Leave no unused openings in any box. Install close-up plugs as required to seal openings.

5. Identify circuit numbers and panel on cover of junction box with black marker pen.

B. Box Layouts:

1. Boxes above hung ceilings having concealed suspension systems shall be located adjacent to openings for removable recessed lighting fixtures.

C. Supports:

1. Boxes installed in metal stud walls shall be equipped with brackets designed for attaching directly to the studs or shall be mounted on specified box supports.

2. Boxes installed in suspended ceilings of gypsum board or lath and plaster construction shall be mounted to 16-gauge metal channel bars attached to main ceiling runners.

3. Boxes installed in suspended ceilings supporting acoustical tiles or panels shall be supported directly from the structure above.

4. Boxes mounted above suspended acoustical tile ceilings having exposed suspension systems shall be supported directly from the structure above.

END OF SECTION 260533

SECTION 260542 - CONDUITS, RACEWAYS AND FITTINGS

PART 1 - GENERAL

1.1 Description of Work:

A. The work of this section consists of furnishing and installing conduits, raceways and fittings as shown on the Drawings and as described herein.

1.02 Related Work:

A. See the following specification sections for work related to the work in this section:

1. 260543 Underground Ducts

2. 260544 In Grade Pull Boxes

3. 260519 Line Voltage Wire and Cable

4. 260533 Junction and Pull Boxes

PART 2 - PRODUCTS

2.01 Conduits, Raceways:

A. Electrical Metallic Tubing (EMT) shall be hot-dip galvanized after fabrication. Couplings shall be compression or set-screw type.

B. Flexible Conduit: Flexible metal conduit shall be galvanized steel.

C. Galvanized Rigid Steel Conduit (GRS) shall be hot-dip galvanized after fabrication. Couplings shall be threaded type.

D. Rigid Non-metallic Conduit: Rigid non-metallic conduit shall be PVC Schedule 40 (PVC-40 or NEMA Type EPC-40) conduit approved for underground use and for use with 90˚ C wires.

2.02 Conduit Supports:

A. Supports for individual conduits shall be galvanized malleable iron one-hole type with conduit back spacer.

B. Supports for multiple conduits shall be hot-dipped galvanized Unistrut or Superstrut channels, or approved equal. All associated hardware shall be hot-dip galvanized.

C. Supports for EMT conduits shall be galvanized pressed steel single hole straps.

D. Clamp fasteners shall be by wedge anchors. Shot in anchors shall not be allowed.

2.03 Fittings:

A. Provide threaded-type couplings and connectors for rigid steel conduits; provide steel compression (watertight), or steel set-screw type for EMT, (die-cast zinc or malleable iron type fittings are not allowed). Provide threaded couplings and Meyers hubs for rigid steel conduit exposed to weather.

B. Fittings for flexible conduit shall be Appleton, Chicago, IL, Type ST, O-Z Gedney Series 4Q by General Signal Corp., Terryville, CT, T & B 5300 series, or approved equal.

C. Fittings for use with rigid steel shall be galvanized steel or galvanized cast ferrous metal; access fittings shall have gasketed cast covers and be Crouse Hinds Condulets, Syracuse, NY, Appleton Unilets, Chicago, IL, or approved equal. Provide threaded-type couplings and connectors; set-screw type and compression-type are not acceptable.

D. Fittings for use with rigid non-metallic conduit shall be PVC and have solvent-weld-type conduit connections.

E. Union couplings for conduits shall be the Erickson type and shall be Appleton, Chicago, IL, Type EC, O-Z Gedney 3-piece Series 4 by General Signal Corp., Terryvile, CT, or approved equal. Threadless coupling shall not be used.

F. Bushings:

1. Bushings shall be the insulated type.

2. Bushings for rigid steel shall be insulated grounding type, O-Z Gedney Type HBLG, Appleton Type GIB, or approved equal.

G. Conduit Sealants:

1. Fire Retardant Types: Fire stop material shall be reusable, non-toxic, asbestos-free, expanding, putty type material with a 3-hour rating in accordance with UL Classification 35L4 or as specified on the Drawings.

PART 3 - EXECUTION

3.01 Conduit, Raceway and Fitting Installation:

A. For conduit runs exposed to weather provide rigid metal (GRS).

B. For conduit run underground, in concrete or masonry block wall and under concrete slabs, install minimum ¾" size nonmetallic (PVC) with PVC elbows. Where conduits transition from underground or under slab to above grade install wrapped rigid metal (GRS) elbows and risers.

C. For conduit runs concealed in steel or wood framed walls or in ceiling spaces or exposed in interior spaces above six feet over the finished floor, install EMT.

D. Flexible metal conduit shall be used only for the connection of recessed lighting fixtures and motor connections unless otherwise noted on the Drawings. Liquid-tight steel flexible conduit shall be used for motor connections.

E. The minimum size raceway shall be 1/2-inch unless indicated otherwise on the Drawings.

F. Installation shall comply with the CEC.

G. From pull point to pull point, the sum of the angles of all of the bends and offset shall not exceed 360 degrees.

H. Conduit Supports: Properly support all conduits as required by the NEC. Run all conduits concealed except where otherwise shown on the drawings.

1. Exposed Conduits: Support exposed conduits within three feet of any equipment or device and at intervals not exceeding NEC requirements; wherever possible, group conduits together and support on common supports. Support exposed conduits fastened to the surface of the concrete structure by one-hole clamps, or with channels. Use conduit spacers with one-hole clamps.

   a. Conduits attached to walls or columns shall be as unobtrusive as possible and shall avoid windows. Run all exposed conduits parallel or at right angles to building lines.

   b. Group exposed conduits together. Arrange such conduits uniformly and neatly.

2. Support all conduits within three feet of any junction box, coupling, bend or fixture.

3. Support conduit risers in shafts with Unistrut Superstrut, or approved equal, channels and straps.

I. Moisture Seals: Provide in accordance with NEC paragraphs 230-8 and 300-5(g).

J. Where PVC conduit transitions from underground to above grade, provide rigid steel 90's with risers. Rigid steel shall be half-lap wrapped with 20 mil tape and extend minimum 12" above grade.

K. Provide a nylon pull cord in each empty raceway.

L. Provide galvanized rigid steel factory fittings for galvanized rigid steel conduit.

M. Slope all underground raceways to provide drainage; for example, slope conduit from equipment located inside a building to the pull box or manhole located outside the building.

N. Conduits shall be blown out and swabbed prior to pulling wires, or installation of pull cord in empty conduits.

END OF SECTION

SECTION 260543 -UNDERGROUND DUCTS

PART 1 - GENERAL

1.01 Description of Work:

A. The work of this section consists of furnishing and installing raceways, raceway spacers with necessary excavation.

1.02 Related Work:

A. See the following specification sections for work related to the work of this section.

1. 312316.13 Trenching

2. 260542 Conduit Raceway and Fittings

1.03 Standards and Codes:

A. Work and material shall be in compliance with and according to the requirements of the latest revision of the following standards and codes.

1. National Electrical Code (NEC) (Latest Revision)

2. California Electrical Code (CEC).

3. Underground Installations CEC - Article 300.5

4. Rigid NonMetallic Conduit CEC - Article 347

PART 2 - PRODUCTS

2.01 Raceways:

A. As specified in Section 260542 Conduits, Raceways and Fittings.

PART 3 - EXECUTION

3.01 Excavation:

A. As specified in Section 312316.13, Trenching and as required for the work shown on the Drawings.

3.02 Install raceways as indicated on drawings.

3.03 Sand Encasement:

A. As specified in Section 312316.13 - Trenching.

3.04 Backfill:

A. As specified in Section 312316.13 - Trenching.

END OF SECTION

SECTION 260544 - IN GRADE PULL BOXES

PART 1 - GENERAL

1.1 Description of Work:

A. The work of this section consists of providing all labor, supervision, tools, materials, and performing all work necessary to furnish and install pre-cast concrete vaults, and pull boxes with necessary excavation.

1.2 Related Work:

A. See the following specification sections for work related to the work of this section.

1. 312316.13 Trenching.

2. 26 05 43 Underground Ducts.

1.3 Submittals:

A. As specified in Section 260500 and per architectural directions.

1. Catalog Data: Provide manufacturer's descriptive literature - Pre-cast Vaults, Pull Boxes and Accessories.

PART 2 - PRODUCTS

2.1 Materials and Equipment:

A. General Requirements:

1. Pull boxes for electrical power, controls and other communication circuits shall consist of pre-cast reinforced concrete boxes, extensions' bases, and covers as specified herein and as indicated on the Drawings. Pre-cast units shall be the product of a manufacturer regularly engaged in the manufacture of pre-cast vaults and pull boxes. Acceptable manufacturers are Christy, Utility Vault, Brooks, Associated Concrete or equal.

B. Construction:

1. Pre-cast concrete vaults and pull boxes for electrical power distribution and communication circuits with associated risers and tops shall conform to ASTM C478 and ACI 318. Pull boxes shall be the type noted on the Drawings and shall be constructed in accordance with the applicable details as shown. Tops and walls shall consist of reinforced concrete. Walls and bottom shall be of monolithic concrete construction. Duct entrances and windows shall be located near the corners of structures to facilitate cable racking.

C. Covers:

1. The word "ELECTRICAL" shall be cast in the top face of all electrical cable boxes. The word “Signal” or “Fire Alarm” shall be cast in the top of the boxes utilized for these systems.

PART 3 - EXECUTION

3.1 Installation:

A. Install pull boxes where required to limit bends in conduit runs to not more than 360 degrees or where pulling tension achieved would exceed the maximum allowable for the cable to be installed. Note that these boxes are not shown on the Drawings.

B. Pre-cast pull boxes shall be installed approximately where indicated on the Drawings. The exact location of each pull box shall be determined after careful consideration has been given to the location of other utilities, grading, and paving. All cable boxes and secondary pull boxes shall be installed with a minimum of 6-inch thick crushed rock or sand bedding.

C. Paved areas - Vaults and pull boxes located in areas to be paved shall be installed such that the top of the cover shall be flush with the finished surface of the paving.

D. Unpaved Areas - In unpaved areas, the top of vaults and pull box covers shall be approximately 2 inches above finished grade.

E. Joint Seals - Section joints of pre-cast vaults and pull boxes shall be sealed with compound as recommended by the manufacturer.

F. Trenching, Backfilling, and Compaction - Trenching, backfilling and compaction shall be as specified in Section 312316.13 – Trenching.

END OF SECTION 260544

SECTION 262416 - PANELBOARDS AND DISTRIBUTION PANELS

PART 1 – GENERAL

1.01 Description of Work:

A. The work of this Section consists of providing panelboards and circuit breakers as shown on the Drawings and as described herein.

1.02 Related Work:

A. See the following specification sections for work related to the work in this Section.

1. 260519 Line Voltage Wire and Cable
2. 260526 Grounding
3. 262816 Circuit Breakers

1.03 Submittals:

A. Shop Drawings - As specified per architectural directions and Section 260500. For each panelboard and distribution panel furnished under this Contract, submit manufacturer's name, catalog data, and the following information:

1. Panelboard / distribution panel type.
2. Main bus and terminal connection sizes.
3. Location of line connections.
4. Cabinet dimension.
5. Gutter space.
6. Gauge of boxes and fronts.
7. Finish data.
8. Voltage rating.
9. Breaker manufacturer, types, trip rating, and interrupting ratings.
10. When information is available on the Drawings, show breaker circuit numbers and locations along with trip ratings on a panelboard layout.

B. Single Submittal - A single complete submittal is required for all products covered by this Section.

C. Closeout Submittals: Submit operation and maintenance data for panelboards and circuit breakers including nameplate data, parts lists, factory and field test reports, recommended maintenance procedures and typewritten as-built panel schedules. Submit in accordance per architectural directions.

PART 2 – PRODUCTS

2.01 Panelboards:

A. General: Lighting and Receptacle Panelboards shall be the automatic circuit breaker type. The number and arrangement of circuits, trip ratings, spares and blank spaces for future circuit breakers shall be as shown on the Drawings or, if not shown, 42 circuits. All circuit breakers shall be quick-make, quick-break, thermal-magnetic, bolt-on type (unless otherwise noted on drawings), with 1, 2 or 3 poles a shown, each with a single operating handle. Tandem or piggy-back breakers shall not be used.

B. Nameplates:

1. Each panelboard shall have a field mounted identifying, rigid, plastic nameplate giving the panel identification as shown on the Drawings.

2. Each panelboard shall have a manufacturer's nameplate showing the voltage, bus rating, number of phases, frequency and number of wires.

C. Construction:

1. Door and trim shall be finished to match finish type and color of surrounding wall. Box shall be hot-dip galvanized, field finished to match the front.

2. Panelboards and enclosures shall conform to requirements of all relevant codes. Panelboards shall be suitable for use as service equipment.

3. Panelboards shall be furnished with hinged trim fronts with key latch and a typed directory card and holder. Panelboard circuits shall be arranged with odd numbers on the left and even numbers on the right. Provide weatherproof, NEMA type 3R enclosures for outdoor installation.

D. Busbars: Panelboard busbars shall be phase sequence type suitable for bolt-on circuit breakers. All busbars shall be copper.

E. Circuit Breakers: Circuit breakers shall be the molded case type with trip and interrupting ratings as shown on the Drawings.

F. Manufacturer:

1. Panelboard manufacturer shall be Square D, or Siemens, or I.E.M, or General Electric, or Eaton Cutler Hammer. Panelboards shall be of the same manufacturer as the switchboard.

2.02 Distribution Panels:

A. General: Distribution panels shall be the automatic circuit breaker type. The number and arrangement of circuits, trip ratings, spares and blank spaces for future circuit breakers shall be as shown on the Drawings. All circuit breakers shall be quick-make, quick-break, thermal-magnetic bolt-on type, with 1, 2 or 3 poles a shown, each with a single operating handle. Tandem or piggy-back breakers shall not be used.

B. Nameplates:

1. Each distribution panel shall have a field mounted, identifying, rigid, plastic nameplate giving the panel identification as shown on the Drawings.

2. Each distribution panel shall have a manufacturer's nameplate showing the voltage, bus rating, number of phases, frequency and number of wires.

C. Construction:

1. Door and trim shall be finished to match color of surrounding wall. Box shall be hot-dip galvanized, field finished to match the front.

2. Distribution panels and enclosures shall conform to requirements of all relevant codes. Distribution panels shall be suitable for use as service.

3. Distribution panels shall have a front door with key latch and a typed directory card and permanently attached holder. Adhesive backed holders are not acceptable. Distribution panels circuits shall be arranged with odd numbers on the left and even numbers on the right. Provide weatherproof, NEMA type 3R enclosures for outdoor installation.

D. Busbars: Distribution panels busbars shall be phase sequence type suitable for bolt-on circuit breakers. All busbars shall be copper, sized for a maximum current density of 1000A psi.

E. Circuit Breakers: Circuit breakers shall be the molded case type with trip and interrupting ratings as shown on the Drawings.

F. Manufacturer:

1. Distribution panel manufacturer shall be Square D, or Siemens, or I.E.M., or General Electric, or Eaton Cutler Hammer. Distribution panels shall be of the same manufacturer as the switchboard.

PART 3 – EXECUTION

3.01 Installation: Panelboards and Distribution Panels shall be installed where indicated on the Drawings, and in accordance with the manufacturer's instructions.

3.02 Mounting:

A. Panelboards and Distribution Panels shall be mounted with the top of the box 6'-6" above the floor. Panelboards and Distribution Panels shall be plumb within 1/8-inch. The highest breaker operating handle shall not be higher than 72 inches above the floor.

3.03 Field Tests:

A. Insulation Resistance Tests: Perform insulation resistance tests on circuits with #2 AWG and larger conductors to be energized with a line-to-neutral voltage of 120 volts or more. Make these tests after all equipment has been connected, except that equipment which may be damaged by the test voltage shall not be connected. Test the insulation with a 500Vdc insulation resistance tester with a scale reading 100 megohms. The insulation resistance shall be 2 megohms or more. Submit results for review.

B. Grounding: Grounding shall conform to Section 260526.

C. Continuity: Panelboard and Distribution Panel circuits shall be tested for continuity prior to energizing. Continuity tests shall be conducted using a dc device with a bell or buzzer.

END OF SECTION

SECTION 262726 - DEVICES WIRING

PART 1 – GENERAL

1.01 Description of Work

A. The work of this section consists of:

1. Furnishing, installing, and connecting all duplex receptacles complete with wall plates and/or covers, as shown on the Drawings.

2. Furnishing, installing and connecting all light switches complete with wall plates and or handle operators, as shown on the Drawings.

1.02 Related Work:

A. See the following specification sections for work related to the work of this section:

1. 26 05 42 Conduits, Raceways and Fittings.

2. 26 05 19 Line Voltage Wire and Cable.

3. 26 05 33 Junction and Pull Boxes.

1.03 Submittals: As specified in Section 26 05 00 and per architectural directions.

A. Submit manufacturers published descriptive literature properly marked to identify the items to be supplied.

B. A single complete submittal is required for all products covered by this Section.

PART 2 – PRODUCTS

2.01 Receptacles:

A. General - Receptacles shall be heavy duty, high abuse, grounding type.

B. [Tamper Resistant] Duplex Receptacles:

1. Receptacles shall be specification grade, rated 20 ampere, two-pole, 3-wire, 125 volt, NEMA 5-20 configuration, self-grounding with screw terminals. Color shall be as selected by the Architect.

2. Devices shall have a nylon face, back and side wired.

3. Manufacturer: Hubbell #DR20 Series [Hubbell #DR20_ _ TR], Leviton #16352 Series [Leviton # 16352-TRE _ _ Series].

C. GFCI Receptacles [Tamper Resistant]:

1. Device shall be rated 20 ampere, 2-pole, 3-wire, 120 volts, conforming to NEMA 5-20 configuration. Face shall be nylon composition. Unit shall have an LED type red indicator light, test and reset push buttons. Color shall be as selected by the Architect.

2. GFCI component shall meet UL 943 Class A standards with a tripping time of 1/40 second at 5 milliamperes current unbalance. Operating range shall extend from -31°F to 158°F. Unit shall have transient voltage protection and shall be ceramic encapsulated for protection against moisture.

3. Manufacturer: Hubbell #GF20_ _LA Series [Hubbell # GFTR20 _ _ Series], Leviton #GFNT2 Series [Leviton #GFTR2 Series].

D. Automatically Controlled Receptacles [Tamper Resistant]

1. Receptacles shall be specification grade, rated 20 amperes, two pole, 3-wire, 125V, NEMA 5-20 configuration, self-grounding with screw terminals. Color shall be selected by the Architect.

2. Devices shall have a nylon face, back and side wired. Marking permanently printed, molded, or stamped on the face of the receptacle and in compliance with controlled receptacle marking requirements stated in California Building Energy Efficiency Standards Section 130.5(d)(3).

3. Manufacturer: Pass & Seymour 26352CD (Dual Controlled Receptacle), 26352CH (Half Controlled Receptacle) [TR26352CD (Tamper Dual Controlled Receptacle), TR26352CH (Tamper Half Switched Receptacles); Leviton 16352-1 (Half Controlled Receptacle), Leviton 16352-2 (Dual Controlled Receptacle).

E. Weather Resistant GFCI Receptacles:

1. Device shall be rated 20 ampere, 2-pole, 3-wire, 120 volts, conforming to NEMA 5-20 configuration, Face shall be nylon composition. Unit shall have a LED type red indicator light, test and reset push buttons. Color shall be as selected by the architect.

2. GFCI component shall meet UL 943 Class A standards with a tripping time of 1/40 second at 5 milliamperes current unbalance. Operating range shall extend from -31°F to 158°F. Unit shall have transient voltage protection and shall be ceramic encapsulated for protection against moisture.

3. Manufacturer: Hubbell #GFTR20 _ _ Series, Leviton #GFWR2 Series.

F. Surge Suppression Receptacles:

1. Device shall be rated 20 ampere, 2-pole, 3-wire, 120 volts. Face shall be nylon composition. Unit shall have an LED type "Power-on" indication light and damage-alert audible alarm. Color shall be as selected by the Architect.

2. Surge suppression protection shall be listed to UL standard 1449 and shall instantly absorb a transient surge of 6,000 volts minimum. A minimum of four (4) Metal Oxide Varistors shall be utilized to absorb transients.

3. Manufacturer: Hubbell #HBL8362S Series, Leviton #8380 Series.

2.02 Switches:

A. Switches shall be rated 20 amperes to 120/277 volts ac. Units shall be flush mounted, self-grounding, quiet operating rocker devices. Rocker color shall be as selected by the Architect.

1. Manufacturer: Hubbell #DS_20_ _ Series, Leviton #5621 Series. See plans for single pole, three way and four-way requirements.

B. Timed switches: Shall be as designed by Paragon Electric Company # ET2000f or Watt Stopper TS-400 rated for the voltage specified on drawings. Time-out shall be adjustable from 5 minutes up to 12 hours. Unit shall be provided with warning alarm.

C. Dimmer switches: Switch shall be a specified-on drawings, color per architect. Heat fins shall not be removed, where dimmer switches are ganged together, care shall be taken to install correct size backbox to accommodate switches without removing fins.

2.03 Plates:

A. General - Plates shall be of the style and color to match the wiring devices, and of the required number of gangs. Plates shall conform with NEMA WD 1, UL 514 and FS W-P-455A. Plates on finished walls shall be non-metallic or stainless steel. Plates on unfinished walls and on fittings shall be of zinc plated steel or case metal and shall have rounded corners and beveled edges.

B. Non-Metallic: Plates shall be plain with beveled edges and shall be nylon or reinforced fiberglass.

C. Stainless Steel: Plates shall be .040 inches thick with beveled edges and shall be manufactured from No. 430 alloy having a brushed or satin finish.

D. Cast Metal: Plates shall be cast or malleable iron covers with gaskets so as to be moisture resistant or weatherproof.

E. Blank Plates: Cover plates for future telephone outlets shall match adjacent device wall plates in appearance and construction.

F. Weatherproof Plate: Cover plates in wet and damp locations shall have recessed in-use covers, Taymac or equal. Back box shall be suitable for the wall material where it is installed.

G. Labeling: All switch and receptacle plates shall be labeled on the top portion of the plate with the panelboard and circuit number serving that device. Lettering shall be 3/16" minimum high, black color, on clear Mylar 3/8" tape. Manufactured by P-touch or equal.

PART 3 – EXECUTION

3.01 Installation of Wiring Devices:

A. Interior Locations: In finished walls, install each device in a flush mounted box with washers as required to bring the device mounting strap level with the surface of the finished wall. On unfinished walls, surface mount boxes level and plumb.

B. Mounting Heights: Adjust boxes so that the front edge of the box shall not be farther back from the finished wall plane than 1/4-inch. Adjust boxes so that they do not project beyond the finished wall. Height of device shall be as follows unless otherwise noted on the drawings:

1. Receptacles 15 Inches from finished floor to bottom of box.

2. Toggle Switches 48 Inches from finished floor to top of box.

C. Receptacles:

1. Ground each receptacle using a grounding conductor, not a yoke or screw contact.

2. Install receptacles with connections spliced to the branch circuit wiring in such a way that removal of the receptacle will not disrupt neutral continuity and branch circuit power will not be lost to other receptacles in the same circuit.

3.02 Installation of Wall Plates:

A. General - Plates shall match the style of the device and shall be plumb within 1/16-inch of the vertical or horizontal.

B. Interior Locations, Finished Walls: Install non-metallic plates so that all four edges are in continuous contact with the finished wall surfaces. Plaster filling will not be permitted. Do not use oversized plates or sectional plates.

C. Interior (not wet) Locations, Unfinished Walls: Install stainless steel or cast metal cover plates.

D. Wet Locations: Install cast metal plates with gaskets on wiring devices in such a manner as to provide a rain tight weatherproof installation. Cover shall be [lockable] outdoor "in use" type.

E. Future Locations: Install blanking cover plates on all unused outlets.

3.03 Tests:

A. Receptacles:

1. After installation of receptacles, energize circuits and test each receptacle to detect lack of ground continuity, reversed polarity, and open neutral condition.

END OF SECTION 262726

SECTION 262816 - CIRCUIT BREAKERS

PART 1 - GENERAL

1.01 Description of Work:

A. The work of this Section consists of providing circuit breakers as shown on the Drawings and as described herein.

1.02 Related Work: See the following Specification Sections for work related to the work in this Section.

A. 260500 General Electrical Requirements

B. 262413 Switchboards

C. 262416 Panelboards and Distribution Panels

1.03 Submittals:

A. Shop Drawings - Submittals shall be in accordance with Section 260500 and per architectural directions. For each circuit breaker furnished under this Contract, submit manufacturer's name, catalog data, and the following information:

1. Terminal connection sizes.

2. Voltage rating.

3. Breaker manufacturer, types, trip ratings and interrupting ratings.

B. Single Submittal - A single complete submittal is required for all products covered by this Section.

C. Closeout Submittals: Submit in accordance with and Section 260500, operation and maintenance data for circuit breakers including nameplate data, parts lists, manufacturer's circuit breaker timer, current, coordination curves, factory and field test reports and recommended maintenance procedures.

PART 2 - PRODUCTS

2.01 Circuit Breaker: Each circuit breaker shall consist of the following:

A. A molded case breaker with an over center toggle-type mechanism, providing quick-make, quick-break action. Each circuit breaker shall have a permanent trip unit containing individual thermal and magnetic trip elements in each pole. Multipole circuit breakers shall have variable magnetic trip elements which are set by a single adjustment to assure uniform tripping characteristics in each pole. Circuit breakers shall be of the bolt-on type unless otherwise noted.

B. Breaker shall be calibrated for operation in an ambient temperature of 40°C.

C. Each circuit breaker shall have trip indication by handle position and shall be trip-free.

D. Three pole breakers shall be common trip.

E. The circuit breakers shall be constructed to accommodate the supply connection at either end of the circuit breaker. Circuit breaker shall be suitable for mounting and operation in any position.

F. Breakers shall be rated as shown on Drawings.

G. Circuit breaker and/or Fuse/circuit breaker combinations for series connected interrupting ratings shall be listed by UL as recognized component combinations for use in the end use equipment in which it is installed. Any series rated combination used shall be marked on the end use equipment per CEC section 110-22.

H. Breakers shall be UL listed. Circuit breakers shall have removable lugs.

I. Lugs shall be UL listed for copper and aluminum conductors.

J. Breakers shall be UL listed for installation of mechanical screw type lugs.

K. Circuit breakers serving HACR rated loads shall be HACR type. Circuit breakers serving other motor loads shall be motor rated.

PART 3 - EXECUTION

3.01 Mounting:

A. The highest breaker operating handle shall not be higher than 72 inches above the floor.

END OF SECTION 262816

SECTION 271000 - STRUCTURED CABLING

PART 1 – GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

B. Division 26, Basic Materials and Methods sections apply to work specified in this section.

1.02 REFERENCE STANDARDS:

A. ANSI/TIA-492.AAAC-B – Detail Specification for 850-nm Laser-Optimized, 50-um Core Diameter/125-um Cladding Diameter Class 1a Graded-index Multimode Optical Fibers (OM3/OM4). Current Edition

B. ANSI TIA-492.CAAB – Detail Specification for Class IVa Dispersion-Unshifted Single-Mode Optical Fibers with Low Water Peak. Current Edition

C. ANSI/TIA-568-C.0 – Generic Communications Cabling for Customer Premises.

D. ANSI/TIA-568-C.1 – Commercial Building Communications Cabling Standard Part 1: General Requirements.

E. ANSI/TIA-568-C.2 – Balanced Twisted-Pair Telecommunications Cabling and Components Standards

F. ANSI/TIA-568-C.3 – Optical Fiber Cabling Components Standard

G. ANSI/TIA-569-C – Commercial Building Standard for Telecommunications Pathways and Spaces.

H. ANSI/TIA-606-B – Administration Standard for the Commercial Telecommunications Infrastructure.

I. ANSI/JSTD-607-B – Commercial Building Bonding and Grounding (Earthing) Requirements for Telecommunications.

J. NFPA 70 – National Electrical Code (NEC).

K. BICSI – TDMM, Building Industries Consulting Services International, Telecommunications Distribution Methods Manual (TDMM)

1.03 DESCRIPTION OF WORK:

A. The extent of telephone/data system work is indicated and is hereby defined to include, but not be limited to cable, raceway, outlet boxes, device plates, backboard, cabinets, grounding and miscellaneous items required for complete system.

B. Provide complete cable and outlet system as indicated and described herein. Work includes cable, jacks, terminal blocks, wire management, labeling, transient voltage surge suppression, patch cords, and all terminations. Every cable, conductor and fiber strand installed under this Project shall be properly terminated at both ends and tested.

C. Refer to other Division sections for requirements for raceways, boxes and fittings, wiring devices, and supporting devices, and other sections, as applicable.

D. Provide system testing as described herein.

1.04 QUALITY ASSURANCE:

A. Comply with applicable portions of NEC as to type products used and installation of components. Provide products and materials, which have been UL-listed and labeled. Comply with NEMA standards for low loss extended frequency cable and EIA/TIA TSB-36. Comply with EIA/TIA 568-A, EIA/TIA 569 and manufacturer's recommendations. Comply with EIA/TIA testing standards for horizontal cabling.

1.05 SUBMITTALS AND SUBSTITUTIONS:

A. Submit manufacturer’s data and installation details for all devices, plates, cable, terminal blocks, patch cords, TVSS, wire management, labels and similar equipment.

B. Submit a copy of certification documents.

C. Any substitution requests must be submitted in writing, and approved by Owner or Owner’s Representative in writing prior to acceptance of bid.

D. Substitution requests may only be made for products equal to or better than as specified in this document. Proof of “equal or better” status is imposed on the contractor, not the Owner.

E. Where a specific manufacturer is called out by name, this is the preferred standard. If substitutions are allowed, they are at the discretion of the Owner and based on performance, suitability, quality, administrational requirements, warranty and other factors deemed important to the Owner.

F. For the purposes of this Specification, “or approved equal” is implied for all specified, named products.

1.06 CONTRACTOR QUALIFICATIONS AND TRAINING:

A. The contractor shall be fully conversant and capable in the cabling of low voltage applications such as, but not limited to data, voice and imaging network systems. The Contractor shall at a minimum possess the following qualifications:

1. Possess those licenses/permits required to perform telecommunications installations in the specified jurisdiction.

2. Provide references of the type of installation detailed in this specification.

3. Personnel trained and certified in fiber optic cabling, splicing, termination and testing techniques. Personnel must have experience using a light meter and OTDR.

4. Personnel trained in the installation of pathways and support for housing horizontal and backbone cabling.

5. Personnel knowledgeable in local, state, province and national codes, and regulations. All work shall comply with the latest revision of the codes or regulations. When conflict exists between local or national codes or regulations, the most stringent codes or regulations shall be followed.

6. Be in business a minimum of five (5) continuous years with a Contractor's license in the state where the project is located, and appropriate for the type of work expected herein.

7. Member in good standing of the Certified Installer network associated with the products listed in this Specification and authorized for use in this Project. Contractor must be a member of this installer program before, during, and through completion of the system installation. Supporting documentation will be required as part of the submittal.

8. Maintain a certified RCDD on staff and utilize certified BICSI Installers for this project.

1.07 WARRANTY:

A. A Limited Lifetime Product & Performance Warranty covering all components, equipment and workmanship shall be provided to the Owner, submitted in writing with system documentation. The warranty period shall begin on the system's first use by the owner.

1. Horizontal channels shall be completed with end to end solutions, such as the Berk-Tek Leviton Technologies Solutions. Factory-terminated copper and/or fiber optic patch cords from the solutions provider must be used in order to be eligible for the applicable channel performance guarantees.

2. The Contractor must pre-register the project with the Manufacturer before installation has begun. Following project completion, contractor is responsible for completing all warranty registration procedures on behalf of Owner.

3. Should the cabling system fail to perform its expected operation within this warranty period due to inferior or faulty material and/or workmanship, the contractor shall promptly make all required corrections without cost to the owner.

B. Certified Installer shall provide labor, materials, and documentation in accordance with Manufacturer requirements necessary to ensure that the Owner will be furnished with the maximum available Manufacturer's Warranty in force at the time of this project.

C. The installed structured cabling system shall provide a warranty guaranteeing a minimum channel performance above the ANSI/TIA 568-C requirements for all category-rated solutions in this Specification. See Products section for performance criteria. Standards-compliant channel or permanent link performance tests shall be performed in the field with a Manufacturer-approved certification tester in the appropriate channel or permanent link test configuration.

D. Necessary documentation for warranty registration shall be provided to the manufacturer by the installer (within 10 days) following 100 percent testing of cables.

1. Installer shall submit test results to Manufacturer in the certification tester's original software files.

2. Installer shall ensure that the warranty registration is properly submitted, with all required documentation within 10 days of project completion.

3. Certified Contractor/Integrator must adhere to the terms and conditions of the respective manufacturer's warranty programs.

E. Installer shall ensure that the Owner receives the manufacturer issued project warranty certificate within 60 calendar days of warranty registration.

1.08 BACKBONE SUBSYSTEMS:

A. 19" racks, cabinets, patch panels, rack mounting kits for switch and hubs, wire management components, and patch cables shall be furnished and installed by Contractor.

B. Backbone copper and fiber systems form an interconnected infrastructure between MDF, IDF, and zone enclosures, both inside and between buildings. All cable, connectors, panels and support systems shall be installed and tested by contractor.

C. Typical Fiber backbone will be Singlemode low-water-peak (OS2) fiber optic cable or Laser-Optimized Multimode (OM3) fiber optic cable as noted below and on plan drawings. Singlemode is typically run between buildings and Multimode fiber is run within the building. Singlemode fiber will be terminated on LC connectors using pre-polished connectors or fusion splice pigtails. Multimode fiber may be terminated on LC connectors using pre-polished connectors or fusion splice pigtails, or may be factory pre-terminated onto MTP multi-fiber connectors.

D. No splicing of cables will be required or allowed between endpoints. Armored cable must be grounded at both ends if run outdoors. With armored fiber, no innerduct will be required. Check plans for clarification or exceptions.

1.09 WORK AREA SUBSYSTEM:

A. The connection between the information outlet and the station equipment in the work area is provided by the Work Area Subsystem. It consists of cords, outlets, adapters, and other filters/impedance matching devices.

1.010 HORIZONTAL SUBSYSTEM:

A. The Horizontal Subsystem is the portion of the telecommunications cabling system that extends from the work area telecommunications outlet/connector to the horizontal cross-connect in the telecommunications room/closet. It consists of the telecommunications outlet/connector, the horizontal cables, optional consolidation point, wireless access point cabling, and that portion of the cross-connect in the telecommunications room/closet serving the horizontal cable. Each floor of a building should be served by its own Horizontal Subsystem.

1.011 ADMINISTRATION SUBSYSTEMS:

A. The Administration Subsystem links the Horizontal Subsystem and the Backbone Subsystem together. It consists of labeling hardware for providing circuit identification and patch cords or cross connect wire used for creating circuit connection at the cross connects.

PART 2 - PRODUCTS

2.01 GENERAL:

A. Provide complete raceway, outlet boxes and miscellaneous items as required.

B. Provide minimum 4-$^{11}/_{16}$" square outlet box at each outlet location with single gang plaster or tile ring and 1" conduit to cable tray, backboard, or accessible ceiling or floor space.

C. Provide a complete data cabling and device system as described herein.

2.02 HORIZONTAL CABLING SYSTEMS:

D. NETWORK DATA CABLES

1. Provide 4-pair, 100-Ohm balanced unshielded twisted pair (UTP) Cables for each data outlet designated.

2. All UTP cables passing through air handling space shall be PLENUM-rated (CMP). Cables not passing through air handling spaces may be PVC (CMR) jacketed. Some buildings will require the use of Plenum cable. The contractor is solely responsible for verifying the construction requirements and installing the correct cable. Failure to provide CMP cable in Plenum required spaces will result in the contractor removing and replacing the cable at their own expense.

3. CAT6A UTP cable shall conform to the following requirements:

a. All cables shall be made in the USA of solid annealed copper conductors, 23 AWG, with four individually twisted pairs in a single round cable sheath.
b. Characterized to 750 MHz, 250 MHz greater than the standard
c. Outer diameter 0.300" (7.6mm), CMP
d. Be made by an ISO 9001 and 14001 Certified Manufacturer.
e. Channel margin guarantees for ANSI/TIA 568-C.2 CAT6A and ISO/IEC 11801 Class E_A (margin vs. ANSI/TIA-568-C.2 and margin guarantees are for a standard 2-connector channel).

Insertion Loss	3%	
NEXT	2 dB	
PSNEXT		3 dB
ACR-F (ELFEXT)	5 dB	
PSACR-F (PSELFEXT)	6 dB	
Return Loss	1 dB	
ACR-N	4 dB	
PSACR-N	5 dB	

Approved Products:
Berk-Tek:
Category 6A LANmark XTP, CMP #11082057 (1000’ reel)
Category 6A LANmark XTP, CMR #11082062 (1000’ reel)
Category 6 Premium LM2000, CMP # 10163222 (1000’ reel)
Category 6 Premium LM2000, CMR # 10167476 (1000’ reel)
* Color as noted on drawings/district standard (verify prior to submittal)

E. DATA INFORMATION OUTLETS:

1. COPPER PATCH PANELS

a. Integrated 110-style patch panels shall exceed requirements for Category 6A described in ANSI/TIA-568-C.2 and Class E_A and Class E component requirements (respectively) as described in ISO/IEC 11801 in a typical standard-density (48 ports per 2RU) configuration.
b. Integrated 110-style patch panels shall be available in flat or angled styles, 24 ports per RU in an un-staggered horizontal layout.
c. Modular (unloaded) patch panels shall accept the same Universal jacks as are used at the workstation area outlets. No special “panel jacks” shall be required.
d. Modular patch panels shall be available in flat, angled, Recessed and recessed angled varieties, in 1RU 24 and 48-port versions or 2RU 48 and 72-port configurations.
e. Patch panels shall be sized to fit an EIA standard, 19-inch relay rack, and made of 16-gauge steel and powder-coated black with white silkscreened lettering.

Approved Product examples:
Leviton CAT6A 110-style Flat 1RU 24-port Patch Panel, # 6A586-U24
Leviton CAT6A 110-style Angled 2RU 48-port Patch Panel, # 6A9587-U48
Leviton QuickPort® 1RU Flat 48-port Patch Panel, # 49255-Q48/#49255-H48

2. CAT6A JACKS: Provide modular type Category 6A information outlets for 23-AWG copper cable. These Category 6A (CAT6A) connectors shall be individual snap-in style, and exceed compliance with TIA/EIA-568-C.2 specifications. The connectors shall comply with the following:

   a. Be 8-position/ 8 conductor (8P8C, RJ45-style) modular jacks.
   b. Utilize a universal Keystone-style insertion footprint as the manufacturer's main "flagship" line of products.
   c. Comply with FCC Part 68; UL listed and CSA Certified. Verified to exceed all channel performance requirements in TIA-568-B.2-10 from 1 MHz to 500MHz to support the IEEE 802.a standard for 10 Gigabit Ethernet over UTP Cable.
   d. Each 10G connector is to feature an injection molded Cone of Silence™ technology to eliminate alien crosstalk (AXT).
   e. Every 10G connector to include polymer springs above the tines ("Retention Force Technology" or similar functionality) to promote return of tines to original position and protect against deformation due to stress of patch cords or inappropriate materials insertion
   f. Connector shall have Pair Separation Towers on IDC to facilitate quick, easy terminations without a complete untwist of each pair of conductors.
   g. The connector shall be rear 110-type insulation displacement connectors (IDC) with solder-plated phosphor bronze contacts, configured in a 180° orientation such that the punch down field is in the back, allowing for rear termination.
   h. The connector shall provide a ledge directly adjacent to the 110-style termination against which the wires can be directly terminated and cut in one action by the installation craftsperson.
   i. Connector wiring label shall provide installation color codes for both T568A and T568B wiring schemes on separate labels.

   Approved Products:
   Leviton Atlas-X1 CAT6A QuickPort Module # 61UJK--R*6

   Where * = one of 13 colors. See drawings or check with Owner for application.

3. FACEPLATES: Faceplates provide information outlets to the work area. Contractor shall provide and install single gang faceplate kits to allow up to six data or voice jacks as required for all work area outlets, workstation base feeds, and unused telecom backboxes and furniture openings. Faceplates shall:
   a. Utilize a Quickport ("keystone"-style) footprint to match the approved connectivity manufacturer, and be made by the same manufacturer as the connectors.
   b. Match colors and materials of the power wiring device plates.
   c. Support any connectivity media type, including fiber and copper applications.
   d. Have write-on designation labels for circuit identification together with a clear plastic cover.
   e. Be available in single-gang and double-gang configurations.
   f. Have surface-mount boxes and standoff rings available for both single and double gang faceplates.
   g. Have single-port matching color blank inserts available in packs of 10.
   h. Shall be stainless steel when installed above accessible ceiling.

Approved Products:

Leviton QuickPort Single-Gang, Plain, # 41080-#xP
Leviton QuickPort Single-Gang with ID Windows, # 42080-#xS
Leviton QuickPort Blank Inserts, pack of 10, # 41084-BxB
Leviton QuickPort Stainless Steel wallphone plate, # 4108W-0SP

Where:

= number of ports: 1, 2, 3, 4, 6
x = color: White (W), Ivory (I), Light Almond (T), Gray (G), Black (E)
Check drawings for requirements

2.03 BACKBONE CABLING SYSTEMS

F. BACKBONE CABLES:

1. GENERAL

a. The cable route within a building, connecting closet to closet or closet to the equipment room is the Intrabuilding Backbone Subsystem. It links the Main Distribution Frame (MDF) in the equipment room to Intermediate Distribution Frame (IDF) and Horizontal Cross-connects (HC) in the Telecommunications Room/Closets (TC). It consists of the backbone transmission media between these locations and the associated connecting hardware terminating this media. These fiber optic cables are typically Multimode.

b. Cables run from building to building in a campus, or from campus to campus are part of the Interbuilding Backbone System. It consists of the backbone transmission media between these locations and the associated connecting hardware terminating these media. These fiber optic cables are typically Singlemode.

c. Cables allowed for use in the backbone shall support voice, data, video, wireless and building infrastructure applications. The bending radius and pulling strength requirements of all backbone cables shall be observed during handling and installation. All cables shall conform to ANSI/TIA/EIA-568-C Commercial Building Telecommunications Cabling Standard. These cables include:

1) 4-pair 100-ohm unshielded twisted-pair 100% annealed-copper solid-conductor cables, 100-ohm UTP multi-pair copper cables
2) 50/125μm (micron) Laser-Optimized Multi-Mode Fiber (LOMMF) cables (OM3 or better)
3) 8.3μm low-water peak singlemode optical fiber cables compliant with ITU-T G.652D (OS2).

2. VOICE COPPER BACKBONE CABLE

a. Power-Sum Multi-Pair Category 3 cable, 24 AWG solid-copper conductors in 25-pair binder groups to support 10BASE-T, 100BASE-T and Analog Voice communications at 16Mhz.

Approved Products:
Berk-Tek # 10032111, 25-pr CMP, Gray.
Berk-Tek # 10032396, 25-pr CMR, Gray
Other multiples of 25 acceptable (50, 100, 200, 300 pair as required)

3. SINGLEMODE FIBER OPTIC CABLE

a. Singlemode fiber optical fiber cables shall meet all of the requirements delineated within the specifications of ANSI/TIA/EIA-568-A. Must be a minimum of 12 strands of nominal 8.3-micron optical fiber, and must be appropriate for the environment in which it is installed (Indoor, Indoor/Outdoor, Outside Plant, OFNP or OFNR).
b. Fiber optic cables will utilize an interlocking armor outer cover around an integrated Loose-Tube (indoor/outdoor) cable construction.
c. Loose tube fibers shall utilize a fan-out kit to fit 250-micron fibers into a 900-micron protective sheath when terminating.
d. See plans and scope of work for total strand count between locations.

Approved Manufacturers
Berk-Tek Adventum Indoor/Outdoor Dry Loose-Tube Plenum cable, 12-strand SM, armored, # LTPK12AB0403
Berk-Tek Adventum Indoor/Outdoor Dry Loose-Tube Plenum cable, 24-strand SM, armored, # LTPK12B024AB0403
Berk-Tek Adventum Indoor/Outdoor Dry Loose-Tube OFNR cable, 12-strand SM, armored, # LTRK12AB0403
Berk-Tek Adventum Indoor/Outdoor Dry Loose-Tube OFNR cable, 24-strand SM, armored, # LTRK12B024AB0403
Leviton 12-fiber, 24” fan-out Kit, # 49887-12S

4. MULTIMODE FIBER OPTIC CABLE – FIELD TERMINATED

a. Multimode fiber optical fiber cables shall meet all of the requirements delineated within the specifications of ANSI/TIA/EIA-568-A. Must be a minimum of 12 strands, typically 24 strands, of Laser-Optimized 50-micron optical fiber. Cable jacketing must be appropriate for the environment in which it is installed (Indoor, Indoor/Outdoor, Outside Plant, OFNP or OFNR).

b. Fiber optic cables will utilize an interlocking armor outer cover around an integrated Tight-Buffered (indoor only) cable construction and fiber strands with a 900-micron protective sheath.
c. See plans and scope of work for total strand count between locations.

Approved Manufacturers
Berk-Tek Indoor Plenum tight buffered cable, 12-strand OM3 Armored, # PDPK012EB3010/25
Berk-Tek Indoor Plenum tight buffered cable, 24-strand OM3 Armored, # PDPK024EB3010/25
Berk-Tek Adventum Indoor/Outdoor Plenum cable, 12 strands, # LTP012AB0403
Berk-Tek OSP cable, Loose Tube 12-strand, # OPD012AB0403

Leviton 12-fiber, 24” fan-out Kit, # 49887-12S

5. MULTIMODE FIBER OPTIC CABLES – FACTORY PRETERMINATED

a. Optical fiber cables shall meet all of the requirements delineated within the specifications of ANSI/TIA/EIA-568-A. Cables must be a minimum of 24 strands of 50/125µm (micron) OM3 Laser-Optimized Multi-Mode Fiber (LOMMF) for backbone cabling. Cables must be appropriate for the environment in which it is installed (Indoor, Indoor/Outdoor, OFNP or OFNR) but are not suitable for Outside Plant (aerial or underground). Backbone cables may be used rack-to-rack, MDF-to-IDF, or similar intrabuilding applications.

b. Backbone cables will utilize the MTP® connector, employing a multi-strand ferrule capable of supporting 1G, 10G, 40G or 100G Ethernet and beyond. The MTP® connector is not a field-installable connector, and must be factory polished and tested to ensure precise fiber alignment and finish.

c. All optical fiber backbone cables (trunks) shall be factory terminated, dry loose tube, armored jacket, Laser Optimized 50-micron OM4+ for plenum-rated applications. All trunks shall be labeled on both ends with machine labeling and bar coded with unique numbers. Labels shall be highly visible with white background and black lettering, and shall list origination and destination on both ends before break of individual legs. All Fiber Trunk assemblies shall possess the following characteristics at a minimum:

1) Meet or exceed TIA 568-C.0 for OM4 performance at 550 meters for 10 Gigabit and 150 meters for 40 Gigabit or 100 Gigabit transmissions.
2) Optical fiber jackets shall be durable jacketed construction utilizing loose tube design, aramid yarn, and fiberglass strength members for protection.
3) Optical fiber cable trunks shall have a minimum breakout of 3 feet. All fiber trunks shall utilize a heat shrink at the ends of all breakouts to create a smooth breakout of the fiber subunit legs.
4) Optical fiber subunits shall utilize a round construction. Ribbon construction is not acceptable.
5) All fiber connectors must meet TIA 604.X for compatibility.
6) All Multimode optical fiber subunits of 24 strands shall utilize the 24-strand MTP connector. Optical Fiber subunits of 12 strands shall utilize a 12-strand MTP connector. No optical fiber subunits shall be smaller than 12 strands except for fiber optic jumpers used within the same racks.
7) Multimode fiber optic trunks shall utilize female MTP connectors. 24-strand MTP connectors shall have a Red boot, and 12-strand MTP shall use a Black boot.
8) Singlemode MTP connectors shall be 12-strand, Angle-Polish, and shall have a Green boot.
9) Manufacturer shall provide MTP® brand connectors for specific superior performance characteristics. Generic MPO-style connectors are not acceptable quality. Use of only ferrules or other essential components will not be acceptable, but only the complete MTP system of components used at each connector assembly.
10) All MTP connectors shall be laser cleaved to increase hardness of tip and

precision of end product.

11) All Multimode Fiber Optic Trunks shall utilize Method B Polarity. Singlemode fiber optic trunks shall utilize Method C.
12) All optical fiber cabling trunks shall have a unique identifying label with a bar code for quick identification. The label shall state Manufacturer, trunk length and serial number. Custom labeling shall be available from the manufacturer as an option to aid in deployment during construction.
13) A pulling eye shall be installed on one end of all trunks to help facilitate installation.
14) All optical fiber trunks shall be shipped to project site with a number on the box that will correspond to the layout of the facility for easy identification by the Vendor. All fiber trunks shall include a printed summary test file of all fiber strands inside the box for the Vendor. Additionally, the Manufacturer shall hold all full test data until the project is complete and provide them to Owner along with the applications assurance warranty after the project is completed
15) Installation contractor will re-test all fiber trunks upon completed installation and provide test results to Manufacturer for completion of full product warranty requirements.
16) The contractor shall be responsible for the correct fiber trunk lengths, configuration, and ordering. Fiber Trunk part numbers shall be generated from Leviton.com Online Configurator and must be verified with the Manufacturer prior to ordering.

Approved Products:

Leviton Unity Part # FT-EC024JJ100F36C36CY-NNBS (sample part #, actual part # TDB as required)

Where:

FT	Fiber trunk
E	(G=OM3)
C	Dry loose tube OFNP Plenum, Armored jacket
024	24-strand fiber cable (012 = 12 strand)
JJ	Female 24-strand MTP® on each end (SS= 12-strand MTP/APC)
100F	100’ (use 3-digit length and M for meters)
36	36” breakout, end 1
C	3mm jacketed fiber breakout leg
36C	26” breakout, 3mm tubing, end 2
Y	Pulling eye (Yes)
NN	Staggered ends, 1st and 2nd end both (YY, NN, YN, NY options)
B	Polarity Method (B for MM, B for SM)
S	Standard labeling (C for Custom, supply spreadsheet with order)

G. COPPER TERMINATION BLOCKS

1. Provide termination blocks for Category 3 Backbone Cabling Systems that support up to Category 5e applications and facilitate cross-connection using twisted pair wiring.

2. The connecting hardware block shall support the appropriate Category 3 to 5e voice (non-VOIP) applications and facilitate cross-connection and/or inter-connection using cross-connect wire. The cross-connect hardware shall be of 66-type (telephone) AND:

3. The cross-connect shall be Category 5e 110-style wiring bases, mountable to wall or backboard to provide 110 termination capable of supporting voice, security, and Category 5e data applications, including high megabit and shared-sheath applications when used with Category 5e rated cabling.

4. The components shall be UL listed and ANSI/TIA-568-C compliant. Bases shall support 50, 100 or 300 pair densities with provision for ANSI/TIA-606-B compliant labeling. Plastic bases and blocks shall be made of fire-retardant plastic rated UL 94V-0.

5. Cross-connect blocks shall be available in a variety of insulation displacement clips (IDC) with and without tails, and support wire sizes: Solid: Wire Ranges 22-26 AWG (0.64mm - 0.40mm).

Approved Products:
Leviton 110 Connecting Block, 100-pair w/legs # 41AW2-100
Leviton Wire Manager w/legs, # 41A10-HCM

H. FIBER OPTIC ENCLOSURES, PANELS AND TRAYS

1. All Fiber interconnect centers, panels, enclosures and trays (units) shall provide cross-connect, inter-connect, and splicing capabilities and contain cable management for supporting and routing the fiber cables/jumpers.

2. Rack-Mounted, High Density Fiber Interconnect Center: The high density, rack mounted fiber interconnect center shall:

   a. Fiber enclosure shall be available in 1, 2 and 4RU versions to accommodate termination and splicing of fiber. Enclosure depth shall be 17”.

   b. Enclosure shall feature a sliding tray which removes completely, front or rear, from enclosure to facilitate field terminations and splicing.

   c. Rack-mount enclosure shall have removable transparent hinged doors and slide away covers allow easy access during install and visibility of interior after install.

   d. Fiber Adapter Plates (bulkheads) shall accept SC and LC connectors, MTP® adapters, and plug-n-play MTP modules/cassettes.

   e. Fiber cable management for routing, storage, and protection shall accept patch cords, tight-buffer fiber, and backbone cables. Rear fiber cable management rings shall be stackable and configurable in ¼, ½, or full ring arrangements. Enclosure shall be constructed of 16-gauge steel with a powder-coated black finish and be mountable in a 19" rack or cabinet frame. An optional locking door feature shall be available.

   f. Enclosure shall be available either empty or in custom pre-loaded configurations, with or without locking doors.

Approved Products:

Leviton Opt-X Ultra Rack-Mount 1RU Enclosure, # 5R1UH-S03
Leviton Opt-X Ultra Rack-Mount 2RU Enclosure, # 5R2UH-S06
Leviton Opt-X Ultra Rack-Mount 4RU Enclosure, # 5R4UH-S12
Leviton lock and key # 5L000-KAL
Leviton armored cable ground kit, # DPGRD-KIT

3. FIBER OPTIC WALL-MOUNT ENCLOSURES

a. The enclosure shall mount on a wall in an 8"x13", 12"x14" or 17"x15" footprint.

b. Adapters shall be mounted in metal mounting plates and attached to the enclosure using plastic plungers.

c. There shall be cable entrance ports in the top and bottom of the patch panel on both the distribution and patch sides.

d. Cable entrance ports are designed with a strain relief post with a slot capable of holding a tie wrap.

e. The enclosure shall provide strain relief in the form of a grounding lug and multiple tie wrap points.

f. The enclosure shall have a plastic fiber management ring made of high impact UL 94V-0 rated fire-retardant plastic. This ring shall be stackable and adjustable. A port identification label/card shall be provided.

g. The enclosure shall be made of 16-gauge steel powder coated black.

Approved Manufacturers

Leviton Wall Mount Fiber Enclosure, 2-panel, split-metal door w/key, # 5W120-00N, or larger size as appropriate.

I. FIBER TERMINATION PRODUCTS

1. FIBER ADAPTER PLATES

a. Fiber Adapter Plates shall be used to present field-terminated or pre-terminated discrete, single-strand connectors (e.g. LC) to a fiber enclosure panel.

b. The fiber adapter plate shall be modular and functional for use in either a wall-mount or rack-mount enclosure. The adapter plate shall be provided in LC styles, in 12- or 24-fiber configurations. 12-fiber adapter plates are used to terminate 12-fiber cables, and 24-fiber adapter plates are used to terminate 24-fiber (or greater) cables. Avoid deployment of adapter plates with unused ports at the rear.

c. The adapter plate shall be compliant to TIA-568-C.3 (for performance) and respective TIA-604-X (for intermateability) standards. Adapter plates shall use zirconia ceramic sleeves and be offered in standard fiber type colors pursuant to TIA-568-C.3 standards.

d. LC adapter plates shall be precision-molded in the USA and integrated to eliminate “rattle” and loose fit. All ferrules shall be zirconia-ceramic. Adapter plates shall be offered in standard fiber type colors. Singlemode colors are typically BLUE, Multimode are typically AQUA.

Approved Products:

Leviton Opt-X Fiber Adapter Plate, 12 LC SM Blue, #5F100-2LL
Leviton Opt-X Fiber Adapter Plate, 24 LC SM Blue, #5F100-4LL
Leviton Opt-X Fiber Adapter Plate, 12 LC MM Aqua, #5F100-2QL
Leviton Opt-X Fiber Adapter Plate, 24 LC MM Aqua, #5F100-4QL

2. FIBER CONNECTORS

a. The fiber optic connector shall meet or exceed the requirements described in ANSI/TIA-568-C.3 and ANSI/TIA-604-3 (LC) Connector Intermateablity Standards

b. Connector shall be pre-polished and field installable to eliminate the need for hand polishing, bonding, or epoxy in the field.

c. Connector shall be provided in LC, single-mode or multimode (laser optimized) configurations, terminated on 250 or 900 am buffered fiber and/or 2mm or 3 mm jacketed fiber.

d. Maximum connector insertion loss shall be no greater than 0.5 dB, with an average of 0.1 dB (MM) or 0.2dB (SM). Typical connector return loss shall be 35 dB (multimode) and 56 dB (single mode). All versions shall allow continuity to be verified by use of a visual fault locator (VFL).

e. Connector shall utilize a precision zirconia ceramic ferrule, and be re-terminable up to 3 times during testing without loss of performance.

f. Connector shall require the use of a cleaver with a guaranteed maximum cleaving angle of 2 degrees for multimode and 1 degree for singlemode fibers.

Approved Products:

Leviton FastCAM LC Singlemode, # 49991-SLC
Leviton FastCAM LC Multimode, # 49991-LLC
Leviton / Lynx cleaver # 49886-LNX or equal

3. MTP® MODULES FOR PRE-TERMINATED CABLES

a. 24-strand Multi-Mode Fiber optic MTP-MTP configured trunks which terminate in LC connectors will land on a 24-strand (12 LC Duplex Port) MTP-LC Cassette module and will utilize a 24-strand MTP connector at each end of the trunk. 12-strand Multi-Mode Fiber optic MTP-MTP configured trunks which terminate in LC connectors will land on a 12-strand (6 LC Duplex Port) MTP-LC Cassette module using 12-strand MTP connectors.

b. 24-strand Multi-Mode Fiber optic MTP-MTP configured trunks which terminate in MTP 40G connectors will land on an MTP - MTP Cassette module with (3) 8-strand MTP connectors on the front. Trunks utilizing 2 or more 24-strand MTP connectors may land on a MTP module displaying (2) 24-strand MTP connectors in the rear, and (6) 8-strand (40G) MTP connectors in the front. Multiple modules may be required if trunk cables are configured with greater strand counts or connectors.

c. The MTP modules shall meet the following requirements:
   1) Insertable directly into fiber enclosure panel openings with a push-

pin/grommet latch.

2) Rated for Laser Optimized Multi-mode OM3 optical fiber.
3) Shall utilize a Red male MTP connection at the rear to designate the 24-strand MTP.
4) Shall utilize Method B Polarity.
5) Shall require one Core module at one end of a fiber trunk segment, and one Edge module at the second end to maintain correct polarity across the system.
6) Core modules will be used at the MDF and Edge modules at the IDF ends of the cable for consistency of design.
7) 40G MTP connector housings at front of module shall be Black.

Approved Products:

Leviton Method B polarity, 24-fiber MTP to LC, OM3, Core module
FM-E024CDC0BC
Leviton Method B polarity, 24-fiber MTP to LC, OM3, Edge module
FM-E024CDC0BE
Leviton Method B polarity, 24-fiber MTP to 3x8-fiber MTP, OM3 module
FM-E024NDC0E
Leviton Method B polarity, 2x24-fiber MTP to 6x8-fiber MTP, OM3 module
FM-F048NDC0B

4. SPLICE TRAYS AND CASSETTES

a. Fiber splice trays shall mount to rear of enclosure for terminating bulk fiber optic cable to factory terminated fiber optic pigtails.

1) Splice trays shall be offered in mini and high-density versions with removable clear covers for viewing and inspection of fibers.
2) Incoming fiber shall be secured utilizing a ratchet action foam rubber padding clamp feature or tie-down points to minimize crushing of fiber.
3) The trays shall accommodate slack management of both single-mode and multimode 250 or 900µm fiber and protection of (up to) 12 or 24 fiber heat shrink style fusion splices.
4) Heat shrink splice sleeves shall be included. Splice tray shall be made by the fiber enclosure manufacturer.

b. Fiber pigtail fusion splice modules shall mount to front of fiber enclosure for terminating bulk fiber optic cable to factory terminated fiber optic pigtails, and shall be front-removable.

1) Splice Modules shall be offered in 12- or 24-fiber LC for OS2 (Singlemode) and OM3 (Multimode) fiber types. Construction of module shall be of 14-gauge aluminum for robustness and light weight.
2) Splice Modules shall be pre-loaded and routed with respective 3-meter, color-coded, 12-strand pigtail assembly.
3) Individual pigtails shall have maximum insertion loss of 0.4 dB and 0.35 dB for OM3 and OS2 fiber types, respectively. Return Loss shall be greater than 25 dB (for OM3), 55 dB (for OS2/UPC), and 60 dB (for OS2/APC).
4) Individual compartments in splice module shall provide slack storage and

bend radius protection for incoming backbone fibers, 900 µm tight-buffer fibers, and fusion-spliced fibers. Incoming 250 µm backbone fibers shall be protected by an included braided mesh sleeve. Heat shrink style splice sleeves and tie wraps shall also be included with module.

Approved Products:

Leviton Mini Splice Tray, 12-strand # T5PLS-12F
Leviton High-Density Mini Splice Tray, 24-strand # T5PLS-24F
Leviton LC 12-Fiber pigtail kit, OS2, #UPPLC-KIT
Leviton LC 12-Fiber pigtail kit, OM3, #5LPLC-KIT
Or
Leviton Opt-X 12-Fiber LC OS2 Splice Module # SPLCS-12L
Leviton Opt-X 24-Fiber LC OS2 Splice Module # SPLCS-24L
Leviton Opt-X 12-Fiber LC OM3 Splice Module # SPLCS-12A
Leviton Opt-X 24-Fiber LC OM3 Splice Module # SPLCS-24A

J. COPPER AND FIBER OPTIC PATCH CORDS

1. CAT6A PATCH CORDS

a. Provide factory terminated and tested patch cords from the manufacturer of the structured cabling components. Patch cords must meet or exceed all criteria specified in the horizontal cabling standard subsection above.

b. Copper patch cords shall exhibit the following characteristics:
   1) Slimline, integrated snag-less plug design without incorporating the use of a rubber molded boot.
   2) A narrow profile for less congestion in higher density applications and a strain relief boot ensures long-term network performance
   3) Copper Category 6A patch cords shall be Component-rated per TIA 568-C.2-10 for CAT 6 and CAT6A component performance and Independently tested and verified by Intertek (ETL).
   4) Outside diameter of 0.225” (CAT6) or 0.240” (CAT6A).
   5) 26 AWG stranded conductors for maximum flexibility
   6) CAT6A cord complies with TIA 568-C.2-10 component requirements for connecting hardware from 1 MHz to 500 MHz, ISO 11801 Class E_A, IEEE 802.3an to support 10GBASE-T networks and cULus listed.
   7) Available Lengths: 3', 5', 7', 10', 15', or 20'

c. Provide factory assembled patch cords meeting or exceeding all criteria specified in the horizontal cabling standard subsection above, in the following quantities:

   1) (1) 10’ CAT 6A patch cable per outlet location/faceplate (drop) for use at the workstation.
   2) (1) 5’ (average) CAT 6A patch cable per outlet location/faceplate (drop) for use at the network switch in the MDF and IDF.
   3) (1) 3’ CAT 6A patch cable per outlet location/faceplate (drop) for use at wireless access points.

Approved Products:

Leviton Slimline CAT6A Component-rated Patch Cord, #6AS10-xx*
Leviton Slimline CAT6 Patch Cord, # 6D460-xx*

Where:

xx = Length in Feet

* = color: White (W), Yellow (Y), Red (R), Blue (L), Green (G), Grey (S), Black (E)

2. FIBER JUMPERS AND ARRAY CORDS

a. Fiber optic LC-LC patch cords, or jumpers, will make LC connections from the rack termination points to the equipment. The jumpers will meet the following requirements:

1) Factory-manufactured using 50/125 µm Laser Optimized Multi-Mode OM3 optical fiber. Field terminations on fiber jumpers are not acceptable.
2) Shall utilize A-B polarity.
3) Shall exhibit <0.3 dB insertion loss and -25 dB return loss.
4) Shall be thin, round, 2-strand 2mm fiber cable with duplex "Uni-boot" reversing polarity LC connector at both ends to minimize congestion at rack and in cable managers.
5) Shall be available in standard lengths of 1, 2, 3, 5 and 10 meters and custom-orderable up to any length of feet or meters

b. Fiber-Optic MTP-MTP "array cords" shall utilize 8-strand MTP (female) to 8-strand MTP (male) connectors in a 3mm breakout jacket. The array cords will meet the following requirements:

1) Array cords shall meet an optical insertion loss not to exceed 0.35 dB per mated connector pair.
2) Array cords shall be available in 1-, 2-, 3-, 5-, and 10-meter lengths.
3) Array cords shall be compliant with TIA-568-C.3 and IEEE 802.3ba and available in UL Riser or Plenum rated cables (Riser is acceptable for in-rack patching)
4) Meets TIA-568-C.3 and IEEE 802.3ba standards (40/100GbE), and adheres to TIA-942 data center design guidelines.
5) Boot color for 8-strand MTP array cords shall be Dark Gray.
6) MTP shall be pinned on one end, unpinned on the other, and utilize Method B polarity.

c. Provide factory assembled patch cords meeting or exceeding all criteria specified in the horizontal cabling standard subsection above, in the following quantities:
1) (2) 2m LC duplex fiber jumper for each backbone cable terminated in IDF and MDF
2) (2) 2m MTP-MTP 8-strand fiber array cord for each backbone cable terminated in MTP ports at IDF or MDF
3) Verify quantities and configuration with owner prior to delivery.

Approved Products:

Leviton LC-LC OM3 Reversing Uniboot duplex jumper, #FPC-M3RR1VVxxxMAB

Leviton LC-LC SM Reversing Uniboot duplex jumper, #FPC-S2RR1VVxxxMAB
Leviton 8-Fiber MTP(f)-MTP(m) Method B OM3 array cord, #5L8MN-BxxM

Where:
xxx or xx = Length in Meters, for example, 010 or 03 as required

K. WIRE MANAGEMENT

1. Provide wiring spindles and channels as necessary to allow neat bundling of all wire and cable on backboard. Provide wiring channel (horizontal) above and/or below each termination block or patch panel, or on the side (vertical) as appropriate. Provide wiring channels by same manufacturer of termination blocks or patch panels. Provide nylon or Velcro type ties for all cables at telephone backboard not run in conduit or channels.

2. Provide 1RU ring-style horizontal wire managers between every 2 patch panels as space allows. Provide 2RU horizontal wire manager between the Orange and Blue sets of patch panels if in the same rack, and above and below each similarly-apportioned bank of patch panels.

   a. Cable managers shall be flat, open ring style.
   b. Do not coil or wind patch cords inside ring-style wire managers.
   c. Use recessed flat wire manager as needed within enclosed cabinets to route patch cords to opposite sides, where the rings of the flat wire managers would interfere with cabinet door closure.

Approved Products:
Leviton Horizontal manager, 1RU, # 49253-LPM
Leviton Horizontal manager, 2RU, # 49253-BCM
Leviton Recessed Flat Horizontal manager, 1RU, # 49253-RCM

3. Provide full height, front-and-rear, 8” wide Vertical Wire Managers at the side of and between each 2-post and/or 4-post termination rack or frame. If space will not allow, the 5” wide wire manager may be substituted at row ends only, leaving the 8” vertical wire manager between each rack. Owner approval in writing is required prior to this substitution.
   a. The vertical cable management system shall be cULus listed, PCI rated for 94V-O, ABS rated for UL94HB, and compliant with ANSI/TIA/EIA 568-B standards.
   b. Mounting hardware shall be included to insure the proper installation to infrastructure. It shall mount onto a standard TIA/EIA recognized equipment rack.
   c. The management system shall offer an assortment of accessories, including a bend radius slack loop organizer, cable retainers, and shall accommodate top, bottom, side and pass-through cable routing. Dual hinged, cable concealing covers shall be included.

Approved Products:
Leviton Vertical 80"L x 8"W x 8"D channel, black cover, #8980L-VFR

4. For enclosed cabinets, provide horizontal wire management as specified above and vertical or integrated vertical wire management as described below, pertinent to the cabinet manufacturer.

L. Power Distribution Units (PDU)

1. Provide (2) vertical PDU per rack or wall cabinet. Unswitched, non-surge suppressed. 30" length for wall cabinets and 48" for floor-mounted cabinets.
2. Utilize plug and receptacle style appropriate for installation circuits and equipment interfaces.

Approved Products
Leviton P1000 series # P1042-10L
Leviton P1000 series # P1044-10L

M. Equipment and Ladder Rack System:

A. UL listed Chatsworth 19" W x 84"H x 15" D 45 RMU Aluminum 2 post rack P.N. 55053-703

B. Ladder rack to wall support, Chatsworth Wall Angle Support Kit P.N. 11421-712

C. Rack to runway support Chatsworth mounting plate P.N. 10595-712

D. Ladder rack support system, Chatsworth Universal Cable Runway P.N. 10250-712

E. Straight through ladder rack splice, Chatsworth Butt-Splice Kit P.N. 11301-701

F. Ladder rack junction splice, Chatsworth Junction Splice Kit P.N. 11302-702

G. Ladder rack protective end caps, Chatsworth Protective Rubber End Caps P.N.10642-001

H. Wall support for cable runway Chatsworth Triangular Support Bracket P.N. 11312-712

I. Provide two single sided equipment shelves or each rack installed, Chatsworth P.N. 40074-700.

J. Equipment rack bonding material Chatsworth Green Ground Jumper P.N. 40159-009 and Chatsworth Green Cable Runway Ground Strap Kit P.N. 40164-001

N. LABELING:

A. The contractor shall provide tags, straps, and adhesive labels. These tags, straps, and adhesive labels shall be of high quality that will endure heat, water, and time.

B. Shall meet the legibility, defacement, exposure, and adhesion requirements of UL 969.

C. Shall be pre-printed using a mechanical means of printing.

D. Where used for cable marking, provide vinyl substrate with a white printing area and a clear "tail" that self laminates the printed area when wrapped around the cable. The cable marking shall be immediately visible and within two inches from termination point.

E. Where insert type labels are used, provide clear plastic cover over label.

F. Copper patch panel labeling shall be completed with adhesive labeling kit specifically designed for the panel, Leviton 49257-QHD.

G. Labeling P-touch font size 4MM bold, black on White, 3/8" labeling tape on all work stations, panels and devices.

H. A round Avery label green in color Product Number: 5463 and a station label utilizing the same font size as on work station face plate must be installed on ceiling grid below each wireless cable location for identification. See type "D" Wireless Location Detail.

I. Labels shall be numbered consecutively and separate for each type of use. Refer to Work Station Details for additional information.

J. The contractor shall develop and submit for approval a labeling scheme for the cable installation. The Owner will negotiate an appropriate labeling scheme with the successful contractor. At a minimum, the labeling system shall clearly identify all components of the system: racks, cables, panels and outlets. The labeling system shall designate the cables origin and destination and a unique identifier for the cable within the system. Racks and patch panels shall be labeled to identify the location within the cable system infrastructure. All labeling information shall be recorded on the as-built drawings and all test documents shall reflect the appropriate labeling scheme. Labeling shall conform to the owner's Labeling Grammar and the TIA/EIA-606A standard.

K. CAT6 Labeling:

1. IDF side labeling should follow RM. (Room number). (X port number) example RM01.1
2. Station side cabling should follow IDF(Letter).RM. (Room number). (X port number) example IDF-A.RM01.1
3. IDF side WAP/Bell Locations shall be labeled RM (Room number). (W for wireless/B for bell) example RM01.W
4. Station side WAP/Bell Locations shall be labeled IDF. (Letter).RM (Room number). (W for wireless / B for Bell) example IDF-A. RM01.W

PART 3 - EXECUTION

3.01 INSTALLATION OF TELEPHONE/DATA SYSTEM:

A. Install raceway and cable system and specified equipment as indicated to comply with NEC and recognized industry practices.

B. PRE-INSTALLATION CONFERENCE:

1. Schedule a conference a minimum of five calendar days prior to beginning work of this section.

2. Agenda: Clarify questions related to work to be performed, scheduling, coordination, etc.

3. Attendance: Communications system installer, General Contractor, Owners Representatives and any additional parties affected by work of this section.

4. Copy of Manufacturer warranty pre-application, RCDD qualifications, and other material not include in submittals will be provided by Contractor at this time.

C. WARRANTY:

1. A lifetime performance warranty covering all components, equipment and workmanship shall be submitted in writing with system documentation. The warranty period shall begin on the systems first use by the Owner.

2. The project must be pre-registered with Manufacturer before installation has begun.

3. Should the cabling system fail to perform within its expected operation within this warranty period due to inferior or faulty material and/or workmanship, the Contractor shall promptly make all required corrections without cost to Owner.

D. PATHWAYS AND TOPOLOGY:

1. Prior to placing any cable pathways or cable, the contractor shall survey the site to determine job conditions will not impose any obstructions that would interfere with the safe and satisfactory placement of the cables. The arrangements to remove any obstructions with the Project Manager need to be determined at that time.

2. Provide NEC-sized pull boxes for any run greater than 100 feet, or with more than two ninety-degree bends.

3. Maintain a distance of at least 12 inches from all power conduits and cables, and 6 inches from all fluorescent lighting fixtures. Do not install power feeders 100 amps or greater above or within 5 feet of telecommunications backboard. Do not install telecommunications conduits above power panels or switchboards.

4. The backbone subsystem shall include cable installed in a vertical manner between floor telecommunications room/closets (TCs or IDFs) and the main or intermediate cross-connect in a multi-story building and cable installed horizontally between telecommunications room/closets and the main or intermediate cross-connect in a long single-story building.

5. Unless otherwise recommended by the Owner, all fiber cables will be encased in interlocking armor. All fibers will be terminated in the Telecom Rooms or Cabinets in new

fiber enclosures equipped with sufficient ports, slack storage space and splice trays if required to terminate and secure all fibers.

6. Adequate riser sleeve/slot space shall be available with the ability to ingress the area at a later date in all Telecommunications rooms/closets, such that no drilling of additional sleeves/slots is necessary.

7. The backbone cables shall be installed in a star topology, emanating from the main cross-connect to each telecommunications room/closet. An intermediate cross-connect may be present between the main cross-connect and the horizontal cross-connect. This is known as a hierarchical star topology.

8. Backbone pathways shall be installed or selected such that the minimum bend radius of backbone cables is kept within manufacturer specifications both during and after installation.
9. Do not run fiber cables in conduits which are less than 2” in diameter.

10. All horizontal cables, regardless of media type, shall not exceed 90 m (295 ft) from the telecommunications outlets in the work area to the horizontal cross connect.

11. The combined length of jumpers, or patch cords and equipment cables in the telecommunications room/closet and the work area shall not exceed 10m (33 ft).

12. Horizontal pathways shall be installed or selected such that the minimum bend radius of horizontal cables is kept within manufacturer specifications both during and after installation.

13. For voice or data applications, 4-pair UTP or fiber optic cables shall be run using a star topology from the telecommunications room/closet serving that floor to every individual information outlet.

14. The Contractor shall observe the bending radius and pulling strength requirements of the 4-pair UTP and fiber optic cable during handling and installation.

15. Each run of UTP cable between horizontal portions of the cross-connect in the telecommunication closet and the information outlet shall not contain splices.

16. In a false ceiling environment, a minimum of 3 inches (75 mm) shall be observed between the cable supports and the false ceiling.

17. All horizontal pathways shall be designed, installed and grounded to meet applicable local and national building and electrical codes.

18. J-hooks shall be provided for all suspended cable, at a semi-irregular spacing not to exceed 5 feet between supports.

19. Install ¾” x 4’ x 8’ fire-rated plywood across all walls in telecom rooms, from 6” AFF to 8’-6” AFF. Coat with 2 coats of white paint. Do not paint over fire rating stamp.

20. Contractor shall firestop all used pathways which enter or leave the telecom rooms via conduit, cable tray or slot. Contractor is responsible for installing sleeves at each wall or partition penetration, and firestopping all fire-rated penetrations. Intumescent caulk shall be applied around the outside of each sleeve, and intumescent putty inside the sleeve or conduits around the cables. Appropriate fill ratios must be followed when penetrating fire rated walls.

E. GROUNDING:

1. All grounding / earthing and bonding shall be done to applicable codes, standards and regulations.

2. Telecom Contractor shall bond and ground all telecom room metals. Telecom Contractor shall provide and install TIA-rated Telecommunications Grounding Busbar (TGB) at all MDF and IDF locations, and an in-cabinet grounding busbar at each remote wall-mounted cabinet or telecom enclosure. All ground lugs shall be 2-hole make-up.

3. Electrician will provide connection between TGB and building ground; Telecom contractor (if separate, otherwise electrician) will provide a busbar and ground all equipment and telecom metals to the busbar.

4. Telecom installer will ground and bond all armored and/or shielded cables, racks, cabinets, cable tray, ladder racking, and shielded panels to telecom grounding busbar.

5. All grounding and bonding conductors shall be copper and may be insulated. When conductors are insulated, the sheath shall be green or marked with a distinctive green color, and shall be listed for the application. The minimum bonding conductor size shall be #6 AWG.

6. The Telecommunications Ground Busbar (TGB) shall be dedicated and pre-drilled copper busbar provided with holes for use with standard sized lugs. This busbar shall have minimum dimensions of .25-inch-thick, 4 inches wide, and be variable in length.

7. Two-hole compression ground lugs shall be Chatsworth 40162-901, 40162-904, 40162-909, and 40162-911, or equal, based on the size of the copper conductor to be terminated.

8. All low voltage systems in this project shall be grounded and bonded.

F. CABLES AND TERMINATIONS:

1. Check plans and symbology for final determination of faceplate constitution or consult with Owner prior to bid.

2. Install additional cables as indicated on the drawings. Do not exceed manufacturers' recommendations for maximum allowable pulling tension, side wall pressure or minimum bending radius. Use pulling compound as recommended by cabling manufacturer.

3. Install CAT6A cables for Wireless Access Points and cameras, and CAT6 everywhere else unless otherwise noted.

4. Provide a full-size service loop (at least once around the inside edge of the box) in each J-box in the communications system.
5. Install all cable in plenum spaces with J-hooks of at least 1" in width to disperse the weight on the bottom cables. Homerun all cable to nearest TR Cabinet.

6. Coordinate with EIA/TIA 569 tables 4.4-1 and 4.4-2 for conduit and splice box sizing.

7. Install modular jacks at all outlets shown; one data jack for each data cable at each faceplate or termination point. Install additional cables and modular jacks as indicated on the drawings.

8. Terminate cables at each jack location and at termination board or patch panel. Follow industry guidelines and manufacturers' recommendations and procedures as required. All termination hardware shall be rated to exceed Category 6 specifications as specified above.

9. Label and identify each outlet and cable for data circuits. Label at outlet end and at termination board or patch panel with matching designations.

10. Provide data outlets in surface raceway at 26" on center unless otherwise indicated.

3.02 TERMINAL BLOCKS AND PATCH PANELS:

A. Arrange all terminal blocks in a manner that allows natural wiring progression and minimizes crossing of wires.

3.03 PATCH CORDS:

A. Contractor to provide fiber and copper patch cords in quantities as described as outlined above in section 2.4.G. Neatly install (minimum) one 3', 5' or 7' CAT6 or CAT6A patch cord (as appropriate to reduce unnecessary length in wire managers) at the equipment cabinet between patch panel and owner-provided switches for each classroom and computer location. Dress and bundle patch cords as appropriate for final installation. Provide unused patch cables to Owner upon completion of project.

B. Patch cables and fiber optic jumpers must be supplied and installed by the vendor for all terminated data drops, between network switches, building hubs, etc. so that building-wide networking will be operational once all installation is complete.

C. All fiber patch cords and required workstation/equipment patch cords not installed shall be provided in hand to Owners Representative prior to project closeout.

3.04 LABELING:

A. Provide labels appropriate for all components supplied and installed.

B. Each faceplate, cable or data outlet (drop) will be numbered with a unique identifier based on coordination with Owner prior to labeling. Contractor must present labeling system for approval, with all shop drawings, prior to start of construction.

3.05 TESTING:

A. Test all equipment and each outlet, horizontal cable, termination block, patch cords, etc. to verify compliance with requirements. Testing shall consist of attenuation and NEXT across all splices and devices installed in the field and shall meet latest requirements of EIA/TIA. Re-terminate any cable or connection found to be defective.

B. Tester is to be configured with the specific cable installed, and the Permanent Link test will be performed according to the CAT6A standard methodology. All parameters must exhibit a PASS test result prior to project completion. PASS*, FAIL* or FAIL test results will not be accepted.

C. Repair and resolve any shortcomings in the test results. Mitigation efforts may require re-termination or replacement of the jack, outlet or cable. Repairs or attempts to resolve test failures will be completed solely at the expense of the Contractor.

D. Provide test results to Manufacturer and Owner representative in native Tester format. Upon request, provide a copy of the tester software and license, if needed, at no charge to Owner representative.

E. Include PDF of full test results, summary index in electronic format on CD or memory stick in the O&M package upon project completion.

Approved Tester Products:

Fluke DTX or VERSIV platform Cable Certification testers
Linkware Record Management Software

3.06 PROJECT CLOSEOUT:

A. Operating and maintenance manuals shall be submitted prior to testing of the system. A total of (4) manuals shall be delivered to the Owner. Manuals shall include all service, installation, and programming information.

B. Provide a full set of “as-built” (redline) drawings in AutoCAD DWG and PDF format. Drawings to depict final location and drop/cable identification numbers and labels which match the test reports. Include (1) hard copy paper format of all as-builts in 30”x42” size or equivalent.

C. Contractor to provide all warranty information to Leviton for processing. Leviton will send warranty document direct to Owner.

3.07 TRAINING:

A. Provide four (8) hours training on the operation and installation of the data system, at job site, at no cost to owner.

END OF SECTION

SECTION 275116 - INTERCOM, PUBLIC ADDRESS, CLOCK SYSTEMS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Refer to the General Conditions and all other Section of Division.

1.02 DESCRIPTION OF WORK

A. Furnish and install all labor, materials, equipment, tools, transportation, supervision, services required to provide and leave ready for operation an extension of the existing intercom, P.A. & clock system. The contractor shall include all materials and/or equipment necessary to make a complete working installation. The electrical work shall include, but is not limited to the following:

1. Intercom, public address speakers' handsets, head end equipment, wiring and connections as indicated on drawings to extend existing system to new relocatable.

2. Clocks and wiring to extend existing clock system to new relocatable, as indicated on drawings.

B. Related work included in other Sections:

1. Section 260500, Electrical General Provisions, applies all work in this Section.

2. Basic Construction Materials and Methods: Section 260526.

3. Grounding: Section 260526.

C. Complete installation and wiring of each device. The systems shall include outlet boxes, wiring devices, signaling facilities, and other items as specified.

D. Provide all incidental work and materials involved in installation of the signal equipment including carpentry or structural work for support of junction boxes, conduits, control panels, outlets, etc.

E. The existing intercom console is located in the Administration Building #1.

F. Contractor shall verify existing clocks and speaker wiring, to ensure compatibility. If wiring is not compatible, new shall be installed.

G. Cut and patch walls as required for new devices.

1.03 SUPERVISION AND QUALITY OF WORK

A. The Contractor shall supervise the work of this section, personally, or through an authorized and competent representative.

B. All material and equipment shall be installed in a neat manner. Any material or equipment not installed in the manner described, shall upon the order of the Architect, Engineer or District be removed and replaced in satisfactory manner. No additional expense shall be allowed to repair work required.

C. The Contractor shall carefully study and compare all drawings, specifications and other instructions and shall at once report, prior to bid, to the Engineer via the Architect any error, inconsistency or omission that may be discovered.

PART 2 - PRODUCTS

2.01 GENERAL DESIGN REQUIREMENTS FOR CLOCK AND COMMUNICATION

A. Main Console:

1. The main console is existing.

B. Classroom Speakers:

1. Match existing

C. Classroom Speaker Back Box:

1. Match existing

D. Clock:

1. Match existing

2.02 CONDUCTORS

A. All cables and wires shall be Copper and shall be installed in raceways per C.E.C. Code. All conductors and wires shall be new when delivered to the job site in unbroken packages, with the manufacturer's name and voltage class that shall be plainly indicated on cables and wires.

B. All cables and wires shall be National, Simplex, General Electric, General Cable, West Penn or approved equal. All conductors installed in underground conduit shall be type "THWN" or UL listed for wet location or direct burial.

C. Signal Conductors to each device if existing is not compatible shall be as follows:

1. Speaker and handset wire shall be as noted on drawings.

2. Clock wire shall be as noted on drawings.

PART 3 - EXECUTION

3.01 GROUNDING

A. The Contractor shall provide all necessary grounding for the entire system in accordance with and required by the National Electric Code, and the State of California "Safety Orders".

3.02 TEST AND ADJUSTING

A. The Contractor shall furnish all required test instruments and equipment. Each piece of equipment and the entire systems shall be adjusted and readjusted to insure proper function of all equipment, elimination of noise, and vibration and left improper operating condition.

3.03 ACCEPTANCE

A. Before the work shall be accepted, the Electrical Contractor shall demonstrate to the District and the Engineer that the entire installation is complete and in proper operating condition, and the Contract has been properly and fully executed.

B. Upon acceptance of the work, the Contractor shall deliver to the District a written guarantee to the effect that all parts of the work, including all individual items of equipment and materials and the systems as a whole, shall be free from defects for a period of one year. Upon proper notice, the Contractor shall make good, at their expense any defect that develops or becomes apparent during this period.

END OF SECTION 275116

SECTION 281600 - INTRUSION ALARM SYSTEM

PART 1 - GENERAL

1.01 Description of Work:

A. Furnish and install all materials and equipment including all required equipment, panels, raceways, conductors and connections, and provide all labor required and necessary to complete the work shown on the drawings and/or specified in all Sections of Division 26 and all other work and miscellaneous items, not specifically mentioned, but reasonably inferred for a complete intrusion alarm system installation including all accessories and appurtenances required for testing the systems. It is the intent of the drawings and specifications that all systems will be complete, and ready for operation. No extra charge will be paid for furnishing items required by regulations, but not specified herein, or on drawings.

B. [The contractor shall include all costs to de-commission the existing system before any new construction can start. The [District] [Owner] shall be advised in writing the date as to when the existing system will be de-commissioned. The contractor's scope of work shall not degrade any function or operation of the remaining site intrusion alarm system.]

1.02 Related Work:

A. Division 00 General Conditions, per architectural General Requirements.

B. See the following specification sections for work related to the work in this section.

1. All other sections of Division 26.
2. All other sections of Division 27.

1.03 Submittals:

A. In accordance with Division 26.

B. Submit the following items:

1. Manufacturer's Catalog Data: Manufacturer's original catalog cuts and original description of data of all material and equipment with sufficient information provided so that the exact function of each device is known. Each item supplied shall be clearly identified.

2. Battery Calculations - Verify that battery capacity exceeds supervisory and alarm power requirements by a minimum of 20%.

3. Floor plan of the point to point connections.

4. Diagram of the power circuitry.

5. Riser diagram.

1.04 Quality Assurance:

A. Installer: The installation firm shall be an established communications and electronics contractor with a current California C-7 license and at least 5 years successful installation experience of products utilizing integrated intrusion systems and equipment specific to that required for this project. Provide proof of license to [District] [Owner].

B. All materials, unless otherwise specified, shall be new, and free from any defects. All items of equipment including wire and cable shall be designed by the manufacturer unless otherwise specified, shall function as a complete system and shall be accompanied by the manufacturer's complete service notes and drawings detailing all interconnections.

C. The Contractor shall show satisfactory evidence, upon request, that he maintains a fully equipped service organization capable of furnishing adequate inspection and service to the system. The contractor shall maintain at his facility the necessary spare parts in the proper proportion as recommended by the manufacturer to maintain and service the equipment being supplied.

D. The system manufacturer shall maintain engineering and service departments capable of rendering advice regarding installation and final adjustment of the system.

1.05 Warranties:

A. The contractor shall warrant all equipment and wiring free from inherent mechanical and electrical defect for one year (365 days) from the date of final acceptance. The contractor shall, without additional expense to the owner, replace, in a timely manner, any defective materials or equipment provided by him under this contract within the warranty period.

PART 2 – PRODUCTS

2.01 Intrusion Alarm Control Panel: Contractor shall verify all part numbers are the most current and provide most current products at no additional cost to the [Owner] [District].

A. Control Panel: Enclosure complete with (2) Bosch DX4020 Conettix Ethernet network and Power Sonic PS-1270 12V 7AH battery. Bosch D9412GV2-C with an additional Bosch D8103 & D101 enclosure, lock and key.

B. Enclosure to include sufficient 8-point expanders to support homerun cables to each device. Bosch D8128D Octopopit.

2.02 Power Supply

A. 12 VDC, 5-amp uninterruptible power supply with multi-regulator and battery charger in vented locking 11"H x 15" W x 4" D cabinet. AlarmSaf AS/PLS-12050-B03-UL.

2.03 Motion Detectors

A. Wall mounted passive infrared type. Bosch DS840 with gimble mount B335-3.

2.04 Exterior Bell

A. Amesco ABB-1014 to match site standard.

2.05 Key Pads

A. Wall mounted alarm set/disable keypad with illuminated 16-character vacuum fluorescent display and sounder. Off-white case. Bosch D1255.

2.06 Cable:

A. #22/4 Conductor cable. West Penn 25241.

B. #18/4 Conductor cable. West Penn 25244.

C. #89-610 Barrier Strips for consolidation of power wires at the panel end. Ideal 89 series.

D. Superior Essex 66-272-3B CAT 6+ data cable grey in color. 2 cables from the Intrusion panel shall be terminated on the designated rack at the nearest IDF room.

E. All cable run outdoors or underground shall be U.L. listed type for such locations.

F. All cabling in plenum rated areas shall be plenum rated.

PART 3 – EXECUTION

3.01 General

A. All wiring in walls and hard ceilings shall be installed in conduit. Exposed wiring installed concealed above suspended ceilings is acceptable. Exposed wiring shall be supported on rings or J hooks not to exceed 48 inches on center. Cable sag shall not exceed more than 12” max. Separation of a minimum of 4” is required between low voltage systems throughout the cable run.

B. Each device shall have a homerun from the device to the security panel. No daisy chaining of power or alarm circuit wiring is permitted.

C. End-of-line resistors shall be installed at the device end, not at the panel end.

D. All devices shall be labeled and each end of the device. All cables are to be labeled with a p-touch labeler on both ends.

E. All point assignments shall be coordinated and approved by the [District’s] [Owner’s] IT personnel prior to termination of device cabling at panel end.

3.02 Tests:

A. Field Inspection and Test:

1. Before final acceptance of the work, pre-test system to demonstrate compliance with the contract requirements. System shall be subjected to complete functional and operational tests, including tests in place of each motion sensor.

2. Perform the field inspection and test in the presence of the manufacturer's representative, the owner's representative and Project Inspector of Record (IOR).

3. Test equipment: It shall be the responsibility of the installing Contractor to furnish tools, instruments, and materials required for a thorough test of the system.

3.03 Start Up: Assist:

A. Contractor shall assist [Owner] [District] with system start up, for a complete and operational system. Provide sixteen (8) hours minimum system training. The Contractor shall provide (2) copies of manufacturer's literature.

B. Contractor shall provide an additional (8) hours of assistance, at the site, 30 days after initial systems training.

3.04 Project Closeout:

A. As Built Drawings:

1. Provide a complete set (full size scalable) of reproducible "as-built" and AutoCAD format drawings showing installed wiring, color coding, and wire tag notations for exact locations of all installed equipment, specific interconnections between all equipment, and internal wiring of the equipment upon completion of system.

B. Operating and Instruction Manuals:

1. Operating and Instruction manuals shall be submitted prior to testing of the system. Four complete sets of operation and instructions manuals shall be delivered to the owner upon request.

2. Complete, accurate, step-by-step testing instructions giving recommended and required testing frequency of all equipment, methods for testing each individual piece of equipment, and troubleshooting manual explaining how to test the preliminary internal parts or each piece of equipment shall be delivered upon completion of the system.

C. Maintenance instructions shall be complete, easy to read, understandable, and shall provide the following information:

1. Instructions on replacing any components of the system, including internal parts.

2. Instructions on periodic cleaning and adjustment of equipment with a schedule of these functions.

3. A complete list of all equipment and components with information as to the address and telephone number of both the manufacturer and local supplier of each item.

4. User operating instructions shall be provided prominently displayed on a separate sheet located next to the control unit.

END OF SECTION 281600

SECTION 283100 - FIRE ALARM SYSTEM
PART 1 - GENERAL

1.01 Description of Work:

A. Furnish and install all materials and equipment including all required equipment, panels, raceways, conductors and connections. Provide all labor required and necessary to complete the work shown on the drawings and/or specified in all Sections of Division 16 [26] and all other work and miscellaneous items, not specifically mentioned, but reasonably inferred for the extension of the existing addressable fire alarm system installation including all accessories and appurtenances required for testing the systems. It is in the intent of the drawings and specifications that all systems will be complete, and ready for operation. No extra charge will be paid for furnishing items required by regulations, but not specified herein, or on drawings.

B. The contractor scope of work shall not degrade any function or operation of the remaining site fire alarm system.

1.02 Related work:

A. Division 00 General Conditions, Division 01 General Requirements.

B. See the following specification sections for work related to the work in this section.

1. All other sections of Division 26.

1.03 Codes and Standards:

A. Devices and equipment for fire alarm systems shall be U.L. listed.

B. UL 864 Control Units, Fire Protective Signaling Systems.

C. Devices and equipment for fire alarm system shall be listed by the California State Fire Marshal for the specific purpose the device or equipment is used.

D. Work and material shall be in compliance with and according to the requirements of the latest version of the following standards and codes:

1. California Fire Code (CFC) based on the International Fire Code (IFC) with California Amendments.

2. California Building Code (CBC) based on the International Building Code (IBC) with California Amendments.

3. California Electric Code (CEC) based on the National Electric Code (NEC) and California Amendments.

4. California Mechanical Code (CMC) based on the Uniform Mechanical Code (UMC) and California Amendments.

5. California Plumbing Code (CPC) based on the Uniform Plumbing Code (UPC) and California Amendments.

6. Title 19 C.C.R., Public Safety, State Fire Marshals Regulations.

7. NFPA 72, National Fire Alarm and Signaling Code.

1.04 Submittals:

A. In accordance with Division 26.

B. Submit the following items:

1. Manufacturer's Catalog Data: Manufacturer's original catalog cuts and original description of data of all material and equipment with sufficient information provided so that the exact function of each device is known. Each item supplied shall be clearly identified including both U.L. number and a copy of the State Fire Marshal's listing.

C. Description of conductors to be used with a statement that all wire shall be in conduit. Where accessible ceiling occurs, plenum rated wire on J-hooks are acceptable.

1.05 Quality Assurance:

A. Installer: The installation firm shall be an established communications and electronics contractor with at least 10 years successful installation experience of products utilizing integrated communications systems and equipment specific to that required for this project. The firm shall currently maintain and locally run and operated business. Only California Certified fire alarm technicians or California Certified electrician shall be used to install the fire alarm system. Provide proof to district that all employees are California Certified to install the fire alarm system.

B. All materials, unless otherwise specified, shall be new, and free from any defects. All items of equipment including wire and cable shall be designed by the manufacturer unless otherwise specified, shall function as a complete system and shall be accompanied by the manufacturer's complete service notes and drawings detailing all interconnections.

C. The Contractor shall show satisfactory evidence, upon request, that he maintains a fully equipped service organization capable of furnishing adequate inspection and service to the system. The contractor shall maintain at his facility the necessary spare parts in the proper proportion as recommended by the manufacturer to maintain and service the equipment being supplied.

1.06 Warranties:

A. The contractor shall warrant all equipment and wiring free from inherent mechanical and electrical defect for one year (365 days) from the date of final acceptance. The contractor shall without additional expense to the owner, replace any defective materials or equipment provided by him under this contract within the warranty period.

PART 2 – PRODUCTS

2.01 Fire Alarm Control Panel:

A. The FACP is existing to remain.

2.02 Detection Devices:

A. Manual Pull Stations:

1. Provide non-coded, addressable, semi-recessed, double-action type manual pull station with mechanical reset features. Where installed in existing buildings, boxes may be surface-mounted. Surface mounted boxes shall be the same color as the pull stations.

2. Provide separate screw terminal for each conductor connected to the manual alarm pull station. Break-glass-front pull stations will not be permitted. Provide red aluminum, housing labeled “fire”. The pull stations shall not be resettable without the use of a key. [Provide Stopper II Guards for all manual stations in public areas].

B. Detectors:

1. Each photoelectric smoke detector and heat detector shall be interchangeable via twist-lock mounting base, to ensure matching the proper sensor to the potential hazards of the areas being protected. The system shall recognize when an improper sensor type has been installed in a previously programmed sensor type location.

C. Photoelectric Smoke Detector:

1. Provide white flame-retardant plastic, addressable, analog, photoelectric type, smoke detectors. Detectors shall operate using an optical sensing chamber principal which complies with UL 268.

2. Each detector shall be capable of being set at two sensitivity settings.

3. Each detector shall have two LED visual indicators providing local 360-degree visibility of operating status and alarm indication.

4. Each detector shall be supported independently of wiring connections, and connected by separate screw terminals of each conductor.

5. The detector screen and cover assembly must be easily removable for field cleaning.

D. Combination Fixed Temperature, rate of Rise Heat Detectors:

1. Provide off-white flame-retardant plastic, addressable, combination 140-degree F fixed temperature, rate of rise heat dual thermistor detectors. Detector shall initiate an alarm when temperature rises at a rate of over 15 degrees F per minute or above 140 degrees F.

2. Each detector shall have two LED visual indicators providing local 360-degree visibility of operating status and alarm indication.

3. Contacts shall be self-resetting after response to rate or rise principal. Locate detectors in accordance with UL FPD or FM P7825 listing and the requirements of NFPA 72. Temperature rating of detectors shall be in accordance with NFPA 72.

E. Addressable Monitor Module: provide addressable monitor module wired as style B (class “B”) to provide an address for normally open contact devices.

1. Provide Addressable Monitor Module to monitor status of all Water flow Switches, Valve tamper Switches and Post Indicator Valves.

2.03 Alarm Notification Devices:

A. Color of notification appliances shall be red [white], unless otherwise noted by [District] [Owner].

B. All alarm notification devices shall be synchronized throughout the school campus [building].

C. Strobe Lights: Provide recessed mounted strobe light assembly suitable for use in electrically supervised circuit. Lamps shall be xenon flashtube type, powered from the fire alarm control panel alarm signaling circuit. Strobes shall provide candela ratings as indicated on the drawing’s candelas and flash 60 times per minute unless otherwise noted. Strobes in toilets shall provide a minimum of 15 candelas. Lamps shall be protected be a clear polycarbonate lens. Housing shall be labeled “FIRE” in red vertical lettering.

D. Horns/Strobes: Provide recessed mounted, grille face, vibrating diaphragm type, audio alarm devices consisting of an electro-mechanical horn suitable for use in an electrically supervised circuit. Horn/Strobes shall be provided with a red, tamper resistant grill. Horn shall have a minimum sound rating of 90 DBA at 10 feet and have field selectable sound levels. Horns shall be capable of providing a synchronized, field selectable, temporal code 3 tone. Horns shall have a separate minimum candela as shown on the drawings and flash 60 times per minute unless otherwise noted. Lamps shall be protected by a clear polycarbonate lens. Housing shall be labeled “FIRE” in red vertical lettering.

E. Horns: Provide recessed mounted, grille face, vibrating diaphragm type, audio alarm devices consisting of an electro-mechanical horn suitable for use in an electrically supervised circuit. Horns shall be provided with a red, tamper resistant grill. Horn shall have a minimum sound

rating of 90 DBA at 10 feet and have field selectable sound levels. Horns shall be capable of providing a synchronized, field selectable, temporal code 3 tone. Horns shall have a separate screw terminal for each conductor connection.

F. Exterior Horns: Provide recessed mounted, grille face, vibrating diaphragm type, audio alarm devices consisting of an electro-mechanical horn suitable for use in an electrically supervised circuit. Horns shall be provided with a red, tamper resistant grill, and a weatherproof backbox. Horn shall have a minimum sound rating of 90 DBA at 10 feet and have field selectable sound levels. Horns shall be capable of providing a synchronized, field selectable, temporal code 3 tone. Horns shall have a separate screw terminal for each conductor connection. Horns located in areas subject to moisture or exterior atmospheric conditions, shall be approved for such locations.

G. Field Charging Power Supply (FCPS):

1. The FCPS is a device designed for use as either a remote 24-volt power supply or used to power Notification Appliances.

2. The FCPS shall offer up to 6.0 amps (4.0 amps continuous) of regulated 24-volt power. It shall include an integral charger designed to charge 7.0-amp hour batteries and to support 60-hour standby.

3. The Field Charging Power Supply shall have two input triggers. The input trigger shall be a Notification Appliance Circuit (from the fire alarm control panel) or a relay. Four outputs (two Style Y or Z and two style Y) shall be available for connection to the Notification devices.

4. The FCPS shall include an attractive surface mount backbox.

5. The Field Charging Power Supply shall include the ability to delay the AC fail delay per NFPA requirements.

6. The FCPS include power limited circuitry, per 1995 UL standards.

2.04 Wiring and Conduit:

A. Provide wiring in accordance with NFPA 72.

B. Conductors shall be solid copper. Conductors for 120-volt circuits shall be No. 12 AWG minimum; conductors for low-voltage DC circuits shall be No. 14 AWG minimum for annunciation circuits and No. 14 AWG minimum for initiation circuits. All cables shall be rated and code compliant for their use.

1. All low voltage wiring not installed in conduits shall be plenum rated.

2. Provide color-coded conductors. Identify conductors by plastic-coated, self-sticking, printed markers or by heat-shrink type sleeves. Each conductor used for the same specific function

shall be distinctly color coded. Use different color codes for each interior circuit. Each circuit color code wire shall remain uniform throughout the circuit.

3. Pigtail or "T" tap connections to the evacuation alarm horns, horn/strobes and strobes are not acceptable.

4. Underground circuit or circuits in wet areas shall be gel filled cables in scheduled 40 PVC conduit. There shall be no splicing of any underground cables.

C. Conduits:

1. Identification of Conduit: New conduits containing fire alarm system conductors shall be [red], ¾" minimum. Junction-boxes, covers, gutters, and terminal cabinets, containing fire alarm system conductors, shall be painted red or provided red in color with engraved plastic identification signs permanently attached to the equipment.

2. Do not run fire alarm circuits in the same conduit with the non-fire alarm circuits.

3. Do not run AC circuits in the same conduit with the fire alarm circuits.

4. Provide wiring in rigid metal conduit for exterior installations or where exposed to damage.

5. Conceal conduit in finished areas of new construction and wherever practical in existing construction. Conduit runs shall be straight, neatly arranged properly supported and parallel or perpendicular to walls and partitions. Identify conductors within each enclosure where a tap, splice, or termination is made.

PART 3 - EXECUTION

3.01 Installation:

A. Equipment, materials, installation, workmanship, inspection, and testing shall be in accordance with the NFPA publications and as modified herein.

B. Follow manufacturer's directions in all cases for installation, testing and energizing.

C. Accurately set, level, support, and fasten all equipment.

D. Smoke and heat detectors:

1. No detector shall be located closer than 12 inches to any part of any lighting fixture. Detectors, located in areas subject to moisture or exterior atmospheric conditions, or hazardous locations as defined by NFPA 70, shall be approves for such locations.

E. Conduit where exposed shall be installed parallel with the walls or structural elements; vertical runs to be plumb; horizontal runs to be level or parallel with structure; conduit grouped neatly together with straight runs, all bends parallel and uniformly spaced.

F. Earthquake Resistant installation/fastening of all electrical equipment shall conform to the general requirements of section 1614A of the California Building Code.

3.02 Preliminary Tests:

A. Conduct the following tests during installation of wiring and system components. Correct deficiency pertaining to these requirements prior to formal functional and operational tests of the system, preliminary tests shall be performed in the presence of the Local Fire Authority and Project inspector of Record to determine the conformance with the specified requirements.

B. Ground Resistance: Measure the resistance of each connection to ground. Ground resistance shall not exceed 10 ohms.

C. Dielectric Strength insulation Resistance: Test the dielectric strength and the Insulating resistance of the system interconnecting wiring by means of an instrument capable of generating 500 volts of DC and equipped to indicate leakage current 1000 megohms. For the purpose of this test, connect the instrument between each conductor on the line and between each conductor and ground at the control panel end of the line, with the other extremity open circuited and all series-connected devices in place. The system shall withstand the test without breakdown and shall indicate a resistance of not less than 1.0 minute with a DC potential of not less than 100 volts and not more than 500 volts.

D. Standby Battery Test: prior to formal inspection and tests, place the fire alarm system on standby battery power for 24 [60] hours; immediately thereafter, sound the building evacuation alarm signaling devices for 5 minutes. When the test is complete, the fire alarm system battery charger shall be fully recharged within 24 hours.

E. Field Inspection and Test:

1. Before final acceptance of the work, pre-test system to demonstrate compliance with the contract requirements. System shall be subjected to complete functional and operational tests, including tests in place of each detector. When tests have been completed and corrections made, submit a signed and dated NFPA Certificate of Completion along with a completed testing matrix with the request for formal inspection and tests.

2. Where application of heat would destroy a heat detector, it may be manually activated.

3. Verify the proper receipt of the alarm signals at the central station for the UDACT provide printout of test reports. It shall be the sole obligation of the contractor to coordinate and to provide all testing documentation from the central station.

4. The communication loops and the indicating appliance circuits shall be opened in at least two locations per zone to check for the presence of correct supervisory circuitry.

5. Perform the field inspection and test in the presence of the manufacturer's representative, the owner's representative, local Fire Authority and Project Inspector of Record (IOR).

6. Test equipment: It shall be the responsibility of the installing Contractor to furnish tools, instruments, and materials required for a thorough test of the system. This includes, but is not limited to, the following:

   a. VOM meter

   b. Manufacturer's recommended smoke detector testing device and sensitivity test equipment.

   c. Heat source for testing heat detectors.

   d. Keys to all control panels.

   e. Ladders

3.03 Project Closeout:

A. As Built Drawings:

1. Provide a complete set (full size scalable) of reproducible "as-built" and AutoCAD format drawings showing installed wiring, color coding, and wire tag notations for exact locations of all installed equipment, specific interconnections between all equipment, and internal wiring of the equipment upon completion of system.

B. Operating and Instruction Manuals:

1. Operating and Instruction manuals shall be submitted prior to testing of the system. Four complete sets of operation and instructions manuals shall be delivered to the owner upon request.

2. Complete, accurate, step-by-step testing instructions giving recommended and required testing frequency of all equipment, methods for testing each individual piece of equipment, and troubleshooting manual explaining how to test the preliminary internal parts or each piece of equipment shall be delivered upon completion of the system.

C. Maintenance instructions shall be complete, easy to read, understandable, and shall provide the following information:

1. Instructions on replacing any components of the system, including internal parts.

2. Instructions on periodic cleaning and adjustment of equipment with a schedule of these functions.

3. A complete list of all equipment and components with information as to the address and telephone number of both the manufacturer and local supplier of each item.

4. User operating instructions shall be provided prominently displayed on a separate sheet located next to the control unit in accordance with U.L. Standard 864.

END OF SECTION 283100

SECTION 31 05 13 - SOILS FOR EARTHWORK

PART 1 GENERAL

1.1 SUMMARY

A. All grading, earthwork, excavations, backfills, compaction, and other grading operations shall be accomplished in accordance with the soils report (which shall be a part of the contract documents). Contractor shall be responsible for securing a copy of the soils report. The project soils engineer shall be present during all grading operations. The soils engineer shall direct samples to be submitted and tests to be taken. Contractor shall cooperate with the requirements of the soils engineer.

B. Related Sections:

1. Section 31 22 13 - Rough Grading.
2. Section 31 23 00 - Excavation and Fill.
3. Section 31 23 23.13 - Backfill.
4. Section 31 23 16.13 - Trenching.
5. Section 32 12 16 - Asphalt Pavement.
6. Section 32 11 23 - Aggregate Base Course.

1.2 REFERENCES

A. The project Soils Report and any supplements to the Soils Report.

PART 2 PRODUCTS

2.1 TOPSOIL MATERIALS

A. Topsoil materials shall meet to the requirements of Section 32 90 00 Planting.

B. Class II Permeable Material shall meet the requirement of Caltrans Standard Specifications 68-1.025.

PART 3 EXECUTION

3.1 SOIL REMOVAL

A. Conduct earthwork operations in accordance with the provisions of the Soils Report and any supplements to the Soils Report, and as directed by the Soils Engineer.

END OF SECTION

SECTION 31 10 00 - SITE CLEARING

PART 1 GENERAL

1.1 SUMMARY

A. Section includes removal of surface debris; removal of paving, curbs, sidewalks; removal of trees, shrubs, and other plant life; removal of underground storage tanks; and removal of abandoned utilities.

B. Related Sections:
1. Section 31 05 13 – Soils for Earthwork.
2. Section 31 22 13 - Rough Grading.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.1 PREPARATION

A. Verify that existing plant life designated to remain is tagged or identified.

B. Removed materials are to be removed from the site and disposed of in a lawful manner.

3.2 PROTECTION

A. Locate, identify, and protect utilities from damage that are to remain.

B. Protect trees, plant growth, and features designated to remain.

C. Protect benchmarks, survey control points, and existing structures from damage or displacement.

3.3 CLEARING

A. Clear areas required for access to site and execution of Work.

B. Remove trees and shrubs indicated and in a manner specified on the drawings or in these specifications. Remove tree and shrub root bulbs in their entirety and to a maximum root diameter of one inch.

3.4 REMOVAL

A. Remove debris, rock, and extracted plant life from site to the limits indicated on the drawings.

B. Remove paving, curbs, and concrete from the site to the limits indicated on the drawings.

C. Neatly saw cut edges at limits indicated for all pavement, curbs, and walkways to be removed.

D. Excavate and remove any underground storage tanks and associated plumbing piping, as indicated on the drawings.

3.5 TOPSOIL EXCAVATION

A. Excavate topsoil from areas to be further excavated, relandscaped, or regraded, without mixing with foreign materials for use in finish grading.

B. Stockpile on site and protect from erosion.

C. Remove excess topsoil not intended for reuse, from site.

END OF SECTION

SECTION 311116 - DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to the work of this Section.

1.2 DESCRIPTION OF WORK

A. Extent: Furnish all labor, material, equipment, tools, and incidentals necessary for Demolition work as shown on the Drawings and as specified in this Section. The work includes, but not limited to:
   1. Demolition of synthetic turf, infill, and performance pad.
   2. Demolition of synthetic track surfacing, track asphalt paving, and wood header.
   3. Paving and any other demolition shown on the Civil Drawings.

1.3 SUBMITTALS

A. Indicate on the project schedule submittal, proposed time for demolition work in this Section, including any shut-off time and capping of utility service.

1.4 QUALITY ASSURANCE

A. Reviews: Prior to any site clearing or demolition work, prepare protection measures of items indicated to be preserved and protected for review by the Owner's Representative.

1.5 SITE CONDITIONS

A. Occupancy: Paving areas and structures to be removed or demolished will be vacated and discontinued in use prior to the start of work.

B. Explosives: Use of explosives for demolition work is not permitted.

C. Traffic: Conduct demolition operations and the removal of debris to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities. Do not close or obstruct streets, walks, or other occupied facilities without permission from Owner.

D. Protection: Ensure the safe passage of persons around the area of demolition. Conduct operations to prevent damage to adjacent buildings, structures, other facilities, and injury to persons. See Special Provisions for additional information regarding building access.

E. Construction Fence: Contractor is required to fence site and provide an adequate level of safety and protection at all times during construction.

F. Damage: Promptly repair damages caused to adjacent facilities by demolition operations at no cost to Owner.

PART 2 - PRODUCTS

Not Applicable.

PART 3 - EXECUTION

3.1 DEMOLITION

A. Pollution Controls:

1. Use water sprinkling, temporary enclosures, and other suitable methods to limit the amount of dust and dirt rising and scattering in the air to the lowest practical level.
2. Comply with governing regulations pertaining to environmental protection. Do not use water when it may create hazardous or objectionable conditions such as flooding.
3. Clean adjacent structures and improvements of dust, dirt, and debris caused by demolition operations, as directed by the Owner or governing authorities.

B. General: Remove above and below grade pavements, curbing and other conditions necessary to permit new construction and other work as indicated on the Drawings. Removal of underground pipe or conduit interfering with construction is included under this Section.

C. Damage: Return adjacent areas to condition existing prior to the start of the work.

D. Saw-cutting: Saw-cut all asphalt and concrete to interface with new planting or paving areas. Concrete interfaces are to be saw-cut with a diamond tipped blade. Use the correct blade for the application as determined by the Blade Application Code for Diamond Saw Blades, 2004 edition, developed by the Masonry and Concrete Saw Manufacturers Institute.

3.2 CLEAN-UP

A. Disposal Waste materials are defined as all materials generated by demolition or excavation that are not identified for salvage or re-use by the Owner. Dispose of waste materials legally off-site. Insert additional paragraphs to specify restrictions on Contractor's use of premises or to specify limitations because of Owner occupancy.

END OF SECTION 311116

SECTION 31 22 13 - ROUGH GRADING

PART 1 GENERAL

1.1 SUMMARY

A. Section includes removal of topsoil and cutting, grading, filling, rough contouring, and compacting as indicated on the drawings.

B. Related Sections:

1. Section 31 05 13 - Soils for Earthwork.
2. Section 31 10 00 - Site Clearing.
3. Section 31 23 00 - Excavation and Fill.
4. Section 31 23 16.13 - Trenching.
5. Section 31 23 23.13 - Backfill.

1.2 REFERENCES

A. The provisions of the project Soils Report and any supplements to the Soils Report shall be adhered to for rough grading of the site.

1.3 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements.

B. Project Record Documents: Accurately record actual locations of utilities remaining by horizontal dimensions, elevations or inverts, and slope gradients.

PART 2 PRODUCTS

2.1 MATERIALS

A. Topsoil: as specified in Section 32 90 00 Planting.

B. Other Fill Materials: shall adhere to the provisions of the project Soils Report and any supplements to the Soils Report.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 06 00 - Regulatory Requirements.

B. Verify site conditions.

C. Verify that survey benchmark and intended elevations for the Work are as indicated.

3.2 PREPARATION

A. Identify required lines, levels, contours, and datum.

B. Stake and flag locations of known utilities.

C. Locate, identify, and protect from damage utilities that are to remain.

D. Notify affected utility companies to remove or relocate public utilities indicated on the plans to be removed or relocated by the utility company.

E. Protect above and below grade utilities that are to remain.

F. Protect plant life, lawns, and other features remaining as a portion of final landscaping.

G. Protect bench marks, survey control point, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

3.3 SOIL EXCAVATION

A. Excavate soil from areas to be further excavated, relandscaped, or regraded. as shown on the drawings.

B. When excavating through roots, for trees to remain, perform work by hand and cut roots with sharp axe.

C. Remove excess soil from site.

D. Benching Slopes: Horizontally bench existing slopes steeper than 1:4 (vertical:horizontal) to key placed fill material to slope to provide firm bearing as required by the Soils Report and any supplements to the Soils Report. Minimum horizontal bench shall be 2 feet wide.

E. Stability: Replace damaged or displaced subsoil to same requirements as for specified fill.

3.4 FILLING

A. Install Work in accordance with the project Soils Report and any supplements to the Soils Report.

B. Fill areas to contours and elevations with suitable materials.

C. Place fill material on continuous layers and compact in accordance with the project Soils Report and any supplements to the Soils Report.

D. Maintain optimum moisture content of fill materials to attain required compaction density.

E. Slope grade away from buildings at a minimum slope of two (2%) percent unless noted otherwise.

F. Make grade changes gradual. Blend slope into level areas.

G. Remove surplus fill materials from site.

3.5 TOLERANCES

A. Section 01 40 00 - Quality Control Requirements.

B. Top Surface of Subgrade: Plus or minus 0.05 feet from required elevation on paved or walkway areas and zero (0) feet to minus 0.10 foot in building pad areas.

3.6 FIELD QUALITY CONTROL

A. Testing and inspection shall be provided by the project soils engineer.

B. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at the Contractor's sole expense.

END OF SECTION

SECTION 31 23 00 - EXCAVATION AND FILL

PART 1 GENERAL

1.1 SUMMARY

A. Section includes excavating for building foundations, roads, parking areas, site grading, slabs-on-grade, landscaping areas, and for site structures.

B. Related Sections:

1. Section 31 05 13 – Soils for Earthwork.
2. Section 31 22 13 - Rough Grading.
3. Section 31 23 16.13 - Trenching.
4. Section 31 23 23.13 - Backfill.

1.2 REFERENCES

A. The project Soils Report and any supplements to the Soils Report.

B. Local utility standards when working within 24 inches of the respective utility lines.

PART 2 PRODUCTS

A. Bio-Retention Soils

1. Permeable Class II Aggregate Base or crushed drain rock.

2. Planting soil is 60% sand, 40% compost mix allowing 5”/hour percolation.

PART 3 EXECUTION

3.1 PREPARATION

A. Identify required lines, levels, contours, and datum locations.

3.2 EXCAVATING

A. Underpin adjacent structures which may be damaged by excavating work.

B. Excavate subsoil to accommodate building foundations, slabs-on-grade, paving and site structures.

C. Compact disturbed load bearing soil in direct contact with foundations to original bearing capacity; perform compaction in accordance with Section 31 23 23.13 and 31 23 16.13.

D. Slope banks with machine to angle of repose or less until shored.

E. Do not interfere with 45 degree bearing splay of foundations.

F. Grade top perimeter of excavating to prevent surface water from draining into excavation.

G. Hand trim excavation. Remove loose matter.

H. Remove lumped subsoil, boulders, and rock in accordance with the provisions of the Soils Report and any supplements to the Soils Report.

I. Notify Architect/Engineer of unexpected subsurface conditions and discontinue affected Work in area until notified to resume Work.

J. Correct areas over excavated with backfill and compact replacement as specified for authorized excavation.

K. Remove excess excavated material from site.

3.3 FIELD QUALITY CONTROL

A. The project Soils Engineer shall provide testing and inspection services.

3.4 PROTECTION

A. Prevent displacement or loose soil from falling into excavation; maintain soil stability.

B. Protect structures, utilities and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth operations.

END OF SECTION

SECTION 31 23 16.13 - TRENCHING

PART 1 GENERAL

1.1 SUMMARY

A. Section includes excavating trenches for utilities from outside building to final connection point or public right-of-way or utility; compacted fill from top of utility bedding to subgrade elevations; and backfilling and compaction.

B. Related Sections:

1. Section 31 05 13 – Soils for Earthwork.
2. Section 31 22 13 - Rough Grading.
3. Section 31 23 00 - Excavation and Fill.
4. Section 31 23 23.13 - Backfill.

1.2 REFERENCES

A. The project Soils Report and any supplements to the Soils Report.

1.3 DEFINITIONS

A. Utility: Any buried pipe, duct, conduit, or cable.

1.4 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

1.5 COORDINATION

A. Section 01 06 00 - Regulatory Requirements.

B. Verify Work associated with lower elevation utilities is complete before placing higher elevation utilities.

C. Verify elevations of existing facilities prior to placing new Work.

PART 2 PRODUCTS

2.1 FILL MATERIALS

A. Fill and Structural Fill shall be: As specified in the project Soils Report and any supplements to the Soils Report.

2.2 ACCESSORIES

A. Filter Fabric: Non-biodegradable, woven as manufactured by TC Mirafi, Tenax Corp., Tensar Earth Technologies, Inc. or equal.

PART 3 EXECUTION

3.1 LINES AND GRADES

A. Grades
1. Pipes shall be laid true to the lines and grades indicated.
2. The grade alignment of the pipe shall be maintained by the use of a string line parallel with the grade line and vertically above the centerline of the pipe. This line shall be established on level batter boards at intervals of not more than 25 feet. Batter boards shall span the trench and be rigidly anchored to substantial posts driven into the ground on each side of the trench. Three adjacent batter boards must be set before laying pipe to provide a check on the grades and line. Elevation and position of the string line shall be determined from the elevation and position of offset points or stakes located along the pipe route. Pipe shall not be laid using side lines for line or grade.
3. As an alternative means of establishing alignment and grade, a "Laser-Beam" instrument may be utilized with a competent operator.

B. Location of Pipe Lines:
1. The location and approximate depths of the proposed pipe lines are shown on the Drawings.
2. An underground locate service shall be enlisted to discover the location of existing utilities regardless if they are shown on the drawings.
3. The Architect/Engineer reserves the right to make changes in lines, grades, and depths of pipe lines and manholes when such changes are necessary.

3.2 PREPARATION

A. Identify required lines, levels, contours, and datum locations.

B. Protect plant life, lawns, and other features remaining as a portion of final landscaping.

C. Protect bench marks, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

D. Maintain and protect above and below grade utilities which are to remain.

E. Cut out soft areas of subgrade not capable of compaction in place. Backfill and compact to density equal to or greater than requirements for subsequent backfill material.

3.3 EXCAVATING

A. Excavate subsoil required for utilities.

B. Cut trenches sufficiently wide to enable installation and allow inspection. Remove water or materials that interfere with Work.

C. Do not interfere with 45 degree bearing splay of foundations.

D. Hand trim excavation. Hand trim for bell and spigot pipe joints. Remove loose matter.

E. Remove lumped subsoil, boulders, and rock as directed by the Soils Engineer or other inspector.

F. Correct over excavated areas with backfill and compact replacement as specified for authorized excavation.

G. Stockpile excavated material on site. Remove excess material not being used from site.

3.4 TRENCHING

A. Excavations:

1. Excavation shall be dug so that the pipe can be laid and jointed properly. The trench shall be made so that the pipe can be laid to the alignment and depth as shown on the Drawings, and it shall be excavated only so far in advance of pipe laying as permitted by the Architect/Engineer. The excavation shall not be more than two feet wider at the bottom than the outside diameter of the pipe or structure. If there is no interference with construction, or adjacent property, and if soil permits, the Contractor at his own expense shall be permitted to slope the side walls of the excavation starting at a point two (2) feet above the top of pipe.
2. The trench shall be excavated to the depth required so as to provide a uniform and continuous bearing and support for the pipe on bedding material at every point between joints, except where pipe slings or other lifting tackle are withdrawn.
3. Excavation Below Grade:
    1) Where excavation indicates that the subsurface materials at the bottom of the trench are in a loose or soft state, the Contractor shall be advised to excavate to a depth where suitable material is encountered, as directed by the Architect/Engineer.
    2) Where the bottom of the trench has been excavated by mistake to a greater depth than required, the Contractor shall refill this area using approved material. No additional compensation shall be given to the Contractor. Refilling with earth to bring the bottom of the trench to the proper grade will not be permitted.
4. Excavation within 24 inches of existing utilities shall be governed by specifications of the Owner of the respective utility. The Contractor shall obtain these specifications and follow the same at no extra cost.
5. Excavation and shoring shall adhere to the requirements and safety standards set by OSHA.

B. Trenching in Advance of Pipe Laying: The trench for the pipe lines shall not be opened for a distance of more than 200 feet at any one time, unless authorized by the Architect/Engineer. At no time will the Contractor be permitted to leave more than 50 feet of trench open at the end of a working day. Adequate protection of open trench shall be provided by the Contractor and the Contractor shall be responsible therefore.

3.5 SHEETING AND BRACING

A. General:
1. Sheeting and bracing of all excavations shall conform to the latest statutes of the State of California governing safety of workers in the construction industry. When necessary, in the opinion of the Contractor, adequate sheeting and bracing shall be installed to prevent ground movement that may cause damage or settlement to adjacent structures, pipelines and utilities. Any damage due to settlement because of failure to use sheeting or because of inadequate bracing, or through negligence or fault of the Contractor in any other manner, shall be repaired at the Contractor's expense.
2. Sides of trenches in unsuitable, loose or soft material, five feet or more in depth, shall be shored, sheeted, braced, sloped, or otherwise supported by means of sufficient strength to protect employees working within them.

B. Sheeting Requirements:
3. Where excavations are made with vertical sides which require supporting, the sheeting and bracing shall be of sufficient strength to sustain the sides of the excavations and to prevent movement which could in any way injure the Work, or adjacent structures, or diminish the working space sufficiently to delay the Work. Special precautions shall be taken where there is additional pressure due to the presence of other structures.
4. It shall be the Contractor's responsibility to select sheeting and bracing of sufficient dimensions and strength and type to adequately support the sides of trenches and excavations.
5. Sheeting and bracing shall be removed before the completion of the Work.

3.6 BACKFILLING

A. Backfill trenches to contours and elevations shown on the drawings.

B. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, or spongy subgrade surfaces.

C. Fill materials shall be as specified in the Soils Report and any supplements to the Soils Report.

D. Employ a placement method that does not disturb or damage utilities in trench. Jetting of backfill materials to achieve compaction shall not be permitted.

E. Maintain optimum moisture content of fill materials to attain required compaction density.

F. Remove surplus fill materials from site.

3.7 TOLERANCES

A. Section 01 40 00 - Quality Requirements.

B. Top Surface of Backfilling Under Paved Areas: Plus or minus 0.05 feet from required elevations.

C. Top Surface of General Backfilling: Plus or minus 1/10 feet from required elevations.

3.8 FIELD QUALITY CONTROL

A. Compaction testing will be performed by the project Soils Engineer.

B. If tests indicate Work does not meet specified requirements, remove Work, replace, compact, and retest.

3.9 PROTECTION OF FINISHED WORK

A. Section 01 70 00 - Execution and Closeout Requirements.

B. Reshape and re-compact fills subjected to vehicular traffic during construction.

END OF SECTION

SECTION 31 23 23.13 - BACKFILL

PART 1 GENERAL

1.1 SUMMARY

A. Section includes building perimeter and site structure, filling and backfilling to subgrade elevations; fill under slabs-on-grade, paving; fill for over-excavation; consolidation and compaction as specified in the Soils Report and any supplements to the Soils Report.

B. Related Sections:

1. Section 31 05 13 – Soils for Earthwork.
2. Section 31 23 00 - Excavation and Fill.
3. Section 31 23 16.13 - Trenching.

1.2 REFERENCES

A. The project Soils Report and any supplements to the Soils Report.

PART 2 PRODUCTS

2.1 FILL MATERIALS

A. Fill and Structural Fill as specified in the Soils Report and any supplements to the Soils Report.

2.2 ACCESSORIES

A. Geotextile Fabric: Non-biodegradable, woven as manufactured by TC Mirafi, Tensar Earth Technologies, Inc. or equal.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 06 00 - Administrative Requirements: Coordination and project conditions.

B. Verify subdrainage, dampproofing, or waterproofing installation has been inspected.

C. Verify structural ability of unsupported walls to support loads imposed by the fill.

3.2 PREPARATION

A. Compact subgrade to density requirements for subsequent backfill materials.

B. Cut out soft areas of subgrade not capable of compaction in place. Backfill and compact to density equal to or greater than requirements for subsequent fill material.

C. Roll subgrade surface to identify soft spots; fill and compact to density equal to or greater than requirements for subsequent fill material.

3.3 BACKFILLING

A. Backfill areas to contours and elevations shown on drawings.

B. Employ a placement method that does not disturb or damage other work.

C. Maintain optimum moisture content of backfill materials to attain required compaction density.

D. Backfill against supported walls and structures. Do not backfill against unsupported walls or structures.

E. Backfill simultaneously on each side of unsupported walls and structures until supports are in place.

F. Slope grade away from building at a minimum slope of two (2%) percent, unless noted otherwise.

G. Make gradual grade changes. Blend slope into level areas.

H. Remove surplus backfill materials from site.

3.4 TOLERANCES

A. Section 01 40 00 - Quality Requirements.

B. Top Surface of Backfilling Under Paved Areas: Plus, or minus 0.05 feet from required elevations.

C. Top Surface of General Backfilling: Plus, or minus 1/10 feet from required elevations.

3.5 FIELD QUALITY CONTROL

A. The project Soils Engineer shall provide testing and inspection services.

3.6 PROTECTION OF FINISHED WORK

A. Section 01 70 00 - Execution and Closeout Requirements.

B. Reshape and re-compact fills subjected to vehicular traffic.

END OF SECTION

SECTION 31 23 23.14 - CONTROLLED LOW STRENGTH MATERIAL

PART 1 GENERAL

1.1 SUMMARY

A. Section includes material for use in trench backfill where conditions require controlled density fill.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of the contract, general and supplementary conditions and Division 1 Specification Sections apply to this Section.

B. Related Sections
1. Section 31 23 16 13 – Trenching
2. Section 31 23 23.13 – Backfill
3. Section 32 11 23 – Aggregate Base Course
4. Divisions 14, 15 and 16, as applies to excavating, trenching and backfill.

1.3 REFERENCES

A. ASTM C-33
B. ASTM C-231
C. ASTM C-150, Type II
D. ASTM C-260
E. ASTM C-618, Class F
F. California Building Code Section 1806A.11 – Pipes and Trenches.
G. Soils Report

1.4 SUBMITTALS

A. Refer to Section 01 34 00 for submittal procedures.

B. Contractor shall submit concrete, mortar and grout mix designs, recent test data for submitted mixes, and test data for mix components confirming that the mixes meet the requirements of this section.

PART 2 GENERAL

2.1 COMPONENTS

A. Controlled Low Strength Material (CLSM) mix shall be composed of a cementitious material, water, fine and course aggregate, and an admixture.

B. The cementitious materials shall be Portland cement in combination with fly ash.

C. The admixture shall be an air-entraining agent.

D. The proportions of all material used in the CLSM shall conform to the mix design.

E. CLSM shall have an unconfined compressive 28-day strength from 50 psi to a maximum of 150 psi. CLSM with a 28-day compressive strength in excess of 200 psi shall be removed and replaced by the contractor as directed by the Engineer/IOR at no cost to the School District.

F. CLSM shall have a minimum set time of 24 hours.

2.2 AGGREGATE CONTENT

A. Aggregate need not conform to ASTM C-33. Any aggregates which produce performance characteristics of the CLSM may be submitted for approval.

B. CLSM mixture shall contain no aggregate that is larger than 3/8 inch.

C. The amount of material passing No. 200 sieve shall not exceed 12.0 percent.

D. No plastic fines shall be present.

2.3 AIR CONTENT

A. The air content by volume based on measurement immediately after discharge from the mixer shall be determined by ASTM C-231.

B. The total calculated air content of the sample prepared in accordance with ASTM C-231 shall not exceed 6.0 percent.

2.4 COMPONENT MATERIALS

Material	Weight	Sp. Gr.	Abs. Vol.
Cement	30 lb	3.15	0.152
Fly Ash	300 lb	2.30	2.09
Water	317 lb	1.00	5.08
Course Aggregate	1645 lb	2.68	8.76
Fine Aggregate	1465 lb	2.68	9.835
Admixture	4 oz	===	1.08

Total	3757 lb	===	27.0 cu ft

2.5 COMPONENT STANDARDS

A. Cement shall conform to ASTM C-150, Type II

B. Fly Ash shall conform to ASTM C-618, Class F. The fly ash shall not inhibit the entrainment of air.

C. Air entrainment admixture shall conform to ASTM C-260.

D. Aggregates:
1. Fine aggregate: #1 concrete sand.
2. Course aggregate: #2 concrete sand – 3/8 pea gravel.

E. Water shall conform to California State Specifications 90-2.03.

PART 3 EXECUTION

3.1 EXAMINATION

A. Division 1 – Administrative Requirements: Coordination and project conditions.

B. Verify trench is ready to receive work.

3.2 DELIVERY TO SITE

A. Provide the Engineer/IOR with delivery tickets for each truck load that show the CLSM mix, the batch quantity and time batched.

3.3 BATCHING, MIXING AND DELIVERING

A. CLSM shall be batched at a Ready-Mix Concrete Plant and delivered to the job site by means of transit mixing trucks.

3.4 INSTALLATION

A. CLSM shall be discharged from transit mix trucks by any reasonable means into the excavation to be backfilled.

B. The CLSM shall be brought uniformly to the elevation of the:
1. Underside of subgrade or asphalt concrete pavement.
2. Underside of structural concrete.

3.5 FIELD QUALITY CONTROL

A. The project Soils Engineer shall provide testing and inspection services.

B. No equipment or traffic shall be allowed on the CLSM until the surface of the CLSM will withstand the weight of the equipment or traffic without damage or displacement.

C. To prevent damage or displacement in traffic areas, provide steel plates that will span the trench until such time as the CLSM has obtained sufficient strength to support equipment and traffic loads.

3.6 FORMING

A. Forms shall conform to the requirements of Section 51 of Caltrans Standard Specifications, July 92 edition.

END OF SECTION

SECTION 32 11 23 - AGGREGATE BASE COURSE

PART 1 GENERAL

1.1 SUMMARY

A. Section includes aggregate base course.

B. Related Sections:
1. Section 31 05 13 - Soils for Earthwork.
2. Section 31 22 13 - Rough Grading.
3. Section 31 23 23.13 - Backfill.
4. Section 31 23 16.13 - Trenching.
5. Section 32 12 16 - Asphalt Pavement.
6. Section 32 13 13 - Concrete Paving.

PART 2 PRODUCTS

2.1 MATERIALS

A. Class II Aggregate Base per Caltrans Standard Specifications, or Local Municipality.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Verify substrate has been inspected, gradients and elevations are correct and is dry.

3.2 PREPARATION

A. Correct irregularities in substrate gradient and elevation by scarifying, reshaping, and re-compacting.

B. Do not place fill on soft, muddy, or frozen surfaces.

3.3 AGGREGATE PLACEMENT

A. Place aggregate in maximum 6-inch layers and compact to specified density.

B. Level and contour surfaces to elevations and gradients indicated.

C. Add small quantities of fine aggregate to coarse aggregate as appropriate to assist compaction.

D. Add water to assist compaction. If excess water is apparent, remove aggregate and aerate

to reduce moisture content.

E. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

3.4 TOLERANCES

A. Section 01 40 00 - Quality Requirements: Tolerances.

B. Flatness: Maximum variation of 1/4 inch measured with 10-foot straight edge.

C. Scheduled Compacted Thickness: Within 1/4 inch.

D. Variation From Design Elevation: Within 1/2 inch.

3.5 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Testing and inspection services.

B. Compaction testing will be performed in accordance with ASTM D1557.

C. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at no cost to owner.

END OF SECTION

SECTION 320516 – LEVELING FINES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to the work of this Section.

1.2 DESCRIPTION OF WORK

A. Extent: Work in this section includes, but is not limited to, providing all labor, materials, and equipment necessary for the complete installation of leveling fines, as shown on the Drawings.

B. Related Work:
   1. Synthetic Turf System

1.3 STANDARDS

A. Unless otherwise shown or specified all materials and methods shall conform to the appropriate current sections of the State of California, Department of Transportation (CALTRANS) Standard Specifications, latest active edition, referred to herein as Standard Specifications, as they reasonably apply to this work, except for measurement and payment requirements.

1.4 DEFINITIONS

A. Relative compaction or compaction: is defined as the in-place dry density of the compacted soil divided by the laboratory compacted maximum dry density as determined by ASTM Test D1557 latest edition, expressed as a percentage.

1.5 SUBMITTALS

A. Contractor shall submit sieve analyses of the stone courses specified to verify conformance to these specifications. Submittals shall include testing from a certified laboratory or Geotechnical Engineer, at compaction percentages specified, and shall verify stone materials to be 100% fractured.

1.6 TESTING

A. General: Test installed aggregate base per the requirements of Caltrans Standard Specifications.

B. Inspection: Notify the Owner's Representative at the completion of the various stages of the operation as indicated below and allow such reasonable time for testing and inspection as the Owners Representative may require. Do not proceed with the next stage until authorization to proceed has been received from the Owners Representative.
   1. After final placement and compaction of finished aggregate base has been prepared to receive turf operations.

C. Testing: document and submit all tests to the Owner's Representative.
   1. Cost of all tests to be borne by the Contractor.
   2. If at any time the aggregate base does not meet the Specifications, restore the aggregate base, at no additional cost to the Owner, to the required grade, cross-section, and density.

PART 2 - PRODUCTS

2.1 LEVELING MATERIAL

A. Stone base materials shall be washed, 100% fractured, by mechanical means, with elongated characters on each individual particle larger than 1/4". Materials shall be devoid of mineral fines. All particles smaller than 1/4" shall be produced by manufactured means only. Rounded sands or aggregates are prohibited.

B. Delivery Moisture Content: Processed stone shall contain 90% to 110% of the optimum moisture content to ensure that fines do not migrate in transit or during placement and to facilitate proper compaction. The contractor shall ensure that aggregate leaving the source plant meet this requirement. The contractor is required to apply water to the processed stone on site to attain and maintain this minimum moisture content.

   1. Stone base materials shall not be allowed to be stockpiled on site, except for that which is end dumped on field surface to be immediately spread into place. See paragraph 3.4 B, this section.
   2. Maintain moisture content throughout installation. See paragraph 3.4 B, this section.

C. Leveling Material: Limestone shall not be acceptable. Stone shall conform the following sieve:

Sieve Size	Percent Passing
3/8 inch	90-100%
No. 4	75-100%
No. 8	40-75%
No. 16	15-40%
No. 30	10-25%
No. 50	2-12%
No. 100	0-8%
No. 200	0-5%
Sand Equivalent:	72+
Durability:	60+

LA Rattler (CTM# 211) 100 Revs, less than or = 9%
500 Revs, less than or = 30%

PART 3 - EXECUTION

3.1 SITE EVALUATION

A. Contractor to verify that cleaning operations of organic material were sufficient to prepare for sub-grade preparation.

3.2 LEVELING STONE INSTALLATION

A. General: Install the leveling fines and finish the stone base as shown on the Drawings.

B. Handling and Placement:

1. Maintain optimum moisture content throughout the installation process.
2. Should any separation of the materials occur, during any stage of the spreading the Contractor shall immediately remove and dispose of segregated material and correct or change handling procedures to prevent any further separation. Double handling of materials shall not be allowed.
3. The Contractor shall utilize laser control equipment for the grading of the stone to ensure accuracy in the grade tolerances of +0" to -1/4".
4. Install processed stone base to the lines and grades shown on the drawings. Under no circumstance shall the material be pushed more than 30' from the point of discharge.
5. The Contractor shall shape the complete surface of the processed stone and continue until the deviation from the required elevation does not exceed a maximum deviation from grade of +0" to -1/4" in ten feet (10'), when measured in any direction using a 10' straight-edge.
6. Each layer shall be spread uniformly with equipment that will not cause perceptible separation in gradation (segregation of the aggregates), with a small laser controlled low ground pressure (LPG) dozer or box scraper.
7. At the existing stone base, the Contractor may elect to use the leveling material to fill in low spots to achieve planarity. It is not intended as an entire field covering at any specific depth. Planarity is expected to be achieved on the ¾” minus permeable stone base. The leveling material is to allow for spots of depressions only.

C. Compaction and Planarity:

1. The processed stone shall be compacted to a minimum/maximum density of 95% as determined by ASTM D1557.
2. Proof-roll wherever possible and mark "soft spots" for additional compaction or correction. Use static tandem drum-type roller of not less than five (5) tons weight. Proof rolling operations shall be performed in the presence of the Architect.

3. The finished surface shall not deviate (tolerance-to-grade) from designated compacted grade. This means that the surface shall not deviate more than 1/4" in 10' (any direction) when placed under a 10 foot straight edge. This tolerance is required over the entire field.

D. Deviations: Areas that deviate shall be marked with spray paint and corrected with the leveling material and rolled tight to achieve proper density. Such remedial actions shall be done by hand and rechecked by means of test procedures described above.

3.3 PROTECTION AND CLEAN-UP

A. Protect the installed aggregate base from contamination by the work of other trades until paving is installed.

B. Disposal: Upon completion of the work and transport excess material from the job site and dispose of in a legal manner.

END OF SECTION 320516

SECTION 32 12 16 - ASPHALT PAVEMENT

PART 1 GENERAL

1.1 SUMMARY

A. Section includes asphaltic concrete paving, wearing, binder and base course; surface sealer; and aggregate base course.

B. Related Sections:
1. Section 31 05 13 - Soils for Earthwork.
2. Section 31 22 13 - Rough Grading: Preparation of site for paving and base.
3. Section 31 23 23.13 - Backfill: Compacted subbase for paving.
4. Section 32 11 23 - Aggregate Base Course.

1.2 REFERENCES

A. ASTM D946 - Penetration-Graded Asphalt Cement for Use in Pavement Construction.

B. ASTM D3381 - Viscosity Graded Asphalt Cement for Use in Pavement Construction.

C. TAI - (The Asphalt Institute) - MS-2 Mix Design Methods for Asphalt Concrete and Other Hot Mix Types.

D. TAI - (The Asphalt Institute) - MS-3 Asphalt Plant Manual.

E. TAI - (The Asphalt Institute) - MS-8 Asphalt Paving Manual.

F. TAI - (The Asphalt Institute) - MS-19 Basic Asphalt Emulsion Manual, Section 8-7.

1.3 SUBMITTALS

A. Product Data: Submit product information and mix design.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with The Asphalt Institute.

B. Mixing Plant: Conform to The Asphalt Institute.

C. Obtain materials from same source throughout.

D. Maintain one copy of each document on site.

1.5 ENVIRONMENTAL REQUIREMENTS

A. Section 01 60 00 - Product Requirements.

B. Do not place asphalt when ambient air or base surface temperature is less than 40 degrees F, or surface is wet or frozen.

PART 2 PRODUCTS

2.1 MATERIALS

A. Asphalt Pavement: In accordance with The Asphalt Institute.

2.2 SOURCE QUALITY CONTROL AND TESTS

A. Section 01 45 23 - Quality Control: Testing and Inspection Services: Provide mix design for asphalt.

B. Submit proposed mix design for review prior to beginning of Work.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Verify compacted granular base is dry and ready to support paving and imposed loads.

C. Verify gradients and elevations of base are correct.

3.2 SUBBASE

A. Section 32 11 23 - Aggregate Base Course forms the base construction for Work of this section.

3.3 PREPARATION - TACK COAT

A. Apply tack coat in accordance with The Asphalt Institute.

B. Apply tack coat to contact surfaces of curbs and gutters.

C. Coat surfaces of manhole and catch basin frames with oil to prevent bond with asphalt pavement. Do not tack coat these surfaces.

3.4 PLACING ASPHALT PAVEMENT - SINGLE COURSE

A. Install Work in accordance with The Asphalt Institute.

3.6 PLACING FOG SEAL

3.7 CURBS

A. Install extruded asphalt curbs of profile as indicated on drawings.

3.8 TOLERANCES

A. Section 01 40 00 - Quality Requirements: Tolerances.

B. Flatness: Maximum variation of 1/4 inch measured with 10-foot straight edge.

C. Scheduled Compacted Thickness: Within 1/4 inch.

D. Variation from True Elevation: Within 1/2 inch.

3.9 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Testing and inspection services
Section 01 70 00 - Execution and Closeout Requirements: Testing, adjusting, and balancing.

3.10 PROTECTION OF FINISHED WORK

A. Section 01 70 00 - Execution and Closeout Requirements: Protecting finished work.

B. Immediately after placement, protect pavement from mechanical injury for 24 hours or until surface temperature is less than 140 degrees F.

3.11 SCHEDULES

A. Pavement sections for various locations and uses are to be as shown on the drawings.

END OF SECTION

SECTION 321223 - TRACK ASPHALT CONCRETE PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to the work of this Section.

1.2 DESCRIPTION OF WORK

A. Extent: Work in this section includes, but is not limited to, providing labor, materials, and equipment necessary for installing all asphalt concrete (AC) paving as shown on the Plans and specified herein.

B. Related Work:
   1. Synthetic Track Surface
   2. Concrete Paving

1.3 STANDARDS

A. Unless otherwise shown or specified all materials and methods shall conform to the appropriate current sections of the State of California, Department of Transportation (CALTRANS) Standard Specifications as they reasonably apply to this work, except for measurement and payment requirements.

1.4 TOLERANCES

A. Tolerances for the finish surface of the track section shall be as specified in the Synthetic Track Surface Sections. Tolerances for sub-grade, sub-base and finished surface of the AC paving shall be as specified by the Standard Specifications, except that the Contractor shall deliver the full aggregate base and asphaltic concrete thickness shown. No combination of high and low tolerances that comprise the section will be permitted.

1.5 TESTING & INSPECTION

A. Contractor shall notify the Architect at the completion of the various stages of the operation as indicated below and shall allow such reasonable time for testing and inspection as the Architect may require. No work shall be done on the next following stage until authorization to proceed has been received from the Architect.

   1. After any rough grading is complete and subgrade has been prepared to receive aggregate base and/or subbase.

2. After each course of aggregate base or subbase has been placed and compacted and is ready for following course.
3. After final placement and compaction of aggregate base or subbase and subgrade has been prepared to receive asphalt prime, or other following operation.
4. When paving equipment is at the site and paving operation is ready to start.

1.6 SUBMITTALS

A. Submit sieve data on all asphalt and base materials to be used.

B. Submit manufacturer's information on all products related to the asphalt paving specified herein.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Aggregate Base: Standard Specifications, Section 26, Class 2, with 3/4" maximum size.

AGGREGATE GRADING REQUIREMENTS

	Percentage Passing			
	1 1/2" Maximum		3/4" Maximum	
Sieve Sizes	Operating Range	Contract Compliance	Operating Range	Contract Compliance
2"	100	100		
1 1/2"	90-100	87-100		
1"			100	100
3/4"	50-85	45-90	90-100	87-100
No. 4	25-45	20-50	35-60	30-65
No. 30	10-25	6-29	10-30	5-35
No. 200	2-9	0-12	2-9	0-12

QUALITY REQUIREMENTS

Test	Operating Range	Contract Compliance
Resistance (R-value)		78 Min.
Sand Equivalent	25 Min.	22 Min.
Durability Index		35 Min.

B. Asphaltic Emulsion for Paint Binder: Standard Specifications, Section 94, SS1.

C. Paving Asphalt: Standard Specifications, Section 92, AR 4000.

D. Mineral aggregates for AC Paving:

1. Track AC Paving: Standard Specifications, Section 39; ¾" maximum size, medium gradation for the bottom course of track paving; 3/8" maximum size, medium gradation, with 6% oil content, for the top course of the track paving.

3/4 inch Maximum, Medium

Sieve Sizes	Limits of Proposed Gradation	Operating Range	Contract Compliance
1"		100	100
3/4"		95-100	90-100
3/8"		65-80	60-85
No. 4	49-54	X±5	X±8
No. 8	36-40	X±5	X±8
No. 30	18-21	X±5	X±8
No. 200		3-8	0-11

3/8 inch Maximum

Sieve Sizes	Limits of Proposed Gradation	Operating Range	Contract Compliance
1/2"		100	100
3/8"		95-100	95-100
No. 4	73-77	X±6	X±10
No. 8	58-63	X±6	X±10
No. 30	29-34	X±6	X±10
No. 200		3-10	0-14

PART 3 - EXECUTION

3.1 GENERAL

A. Verify that the sub-base is properly compacted and at suitable grade for receiving aggregate base. Clear area to be paved of all debris and organic material. Re-compact and re-grade as necessary to place aggregate base.

B. Before beginning base and paving work and during construction, take all steps necessary for protection of existing improvements. As the asphalt concrete is being placed, extreme care shall be taken not to discolor or damage the curbs, fences, or wall surfaces. If damage occurs, repair same, and if repair cannot be made to the satisfaction of the Architect, remove and replace the section. Dispose of all excavated material legally off site.

3.2 SITE PREPARATION

A. If needed, place and compact aggregate base where shown to a depth as noted on the plans as specified for Class 2 aggregate base in Standard Specifications, Section 26.1. Verify grades to allow for finish paving.

B. Clear aggregate base surface of all loose or unsuitable material.

3.3 ASPHALT CONCRETE INSTALLATION

A. Apply paint binder in accord with Standard Specifications, Section 39.4. Paint binder shall be diluted with equal parts of water and applied to all vertical surfaces for existing pavement, curbs, gutters, catch basins, manhole frames, and construction joints in the surfacing, existing bases and pavements to be surfaced, and other surfaces designated by the Architect. Asphaltic paint binder

shall be provided in sufficient quantity to produce a thin, uniform black, glossy coat of asphalt satisfactory to the Architect. Pools in unevenly distributed areas shall be redistributed by means of hand brooms. Verify exact rate of application with the Architect.

B. Before placing surfacing, additional paint binder shall be applied to areas where the paint binder has been destroyed.

C. Asphalt concrete shall be spread and compacted uniformly to a closed, smooth surface and a layer of uniform density, in accord with Standard Specifications, Section 39.6, in thicknesses noted on plans.

D. Finish grades shall be as shown, smooth and without sharp breaks, and shall allow the pavement to drain. The finish surface shall slope as shown on the Plans, and the surface shall not vary under a 10’ straight edge more than 1/8”.

E. It should be the responsibility of the asphalt paving contractor to flood the surface immediately after the asphalt is capable of handling traffic, but within 24 hours. If, after 20 minutes of drying time, there are birdbaths evident, it shall be the responsibility of the architect, in conjunction with the Synthetic track surfacing contractor to determine the method of correction. No cold tar patching, skin patching or sand mix patching will be acceptable.

F. Any oil spills (hydraulic, diesel, motor oil, etc.) must be completely removed, either by chipping out or removing and replacing with new, keyed in asphalt. The minimum depth of any asphalt replacement shall be one inch. The curing time for the asphalt base is 28 days. It shall be the responsibility of the Synthetic track surfacing contractor to determine if the asphalt substrate has cured sufficiently prior to the application of Synthetic track surfacing system.

G. It shall be the responsibility of the general contractor to determine if the asphalt substrate meets all design specifications, i.e. cross slopes, planarity and specific project criteria. After all the above conditions are met, the Synthetic track surfacing contractor must, in writing, accept the planarity of the asphalt receiving base, before track surfacing work can commence. See also Sections 321823 Synthetic Track Surface.

END OF SECTION 321223

SECTION 32 13 13 – CONCRETE PAVING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

B. All grading, earthwork, excavations, backfills, compaction, and other grading operations shall be accomplished in accordance with the soils report (which shall be part of the Contract Documents). Contractor shall be responsible for securing a copy of the soils report. The project soils engineer shall be present during all grading operations. The soils engineer shall direct samples to be submitted and tests to be taken. Contractor shall cooperate with the requirements of the soils engineer.

C. Specification Division 31, Earthwork, Soils and Earthwork, Rough Grading, and Excavation and Fill.

D. Specification 32 11 23 Aggregate Base Course.

1.2 DESCRIPTION OF WORK:

A. The extent of concrete work is shown on the landscape architectural drawings and details and shall include, but is not limited to, pedestrian concrete walkways, steps, ramps, curbs, mow bands, footings and walls.

1.3 QUALITY ASSURANCE:

A. Codes and Standards: Comply with provisions of the following codes, specifications and standards, except where more stringent requirements are shown or specified:

1. Concrete Reinforcing Steel Institute, "Manual of Standard Practice".
2. ACI 318 Building Code Requirements for Structural Concrete.
3. ASTM C150, for Type I, Type II or Type III Portland cement concrete.
4. Chapter 19A, 2022 C.B.C.

B. Certification: Weighmaster Certificate

C. Duties of the Inspector: The inspector shall notify the Architect, Structural Engineer and the Division of State Architect at least 48 hours in advance of the first pour of concrete and sufficiently in advance of subsequent pours. Comply with Section 4-333.1 and Chapter 7, Part I, Title 24, California Code of Regulations (CCR).

D. Installer Qualifications:

1. Experience: The concrete installing firm shall have contracted for and successfully completed construction of a minimum of five (5) California public school district

construction projects, approved by the Division of the State Architect (DSA), within the past five (5) years of similar size, complexity, budget and scope.

2. Licensure: The concrete installation firm shall hold a current, active C8 “Concrete Contractor” license classification by the California State License Board that has been consistently active for at least five (5) years and that has not been suspended or revoked.

3. Supervision: The concrete installing firm shall have a qualified and experienced concrete technician on site during concrete installation.

E. “Colored” Concrete Installer Qualifications: Installer of “colored” concrete shall be qualified by Scofield. Contact local Scofield Representative or the Division Office (323) 720-3055 for a list of locally qualified installers.

1.4 SUBMITTALS:

A. Shop Drawings Reinforcement: Submit shop drawings for fabrication, bending, and placement of concrete reinforcement. Comply with ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures" showing bar schedules, stirrup spacing, diagrams of bent bars, arrangement of concrete reinforcement. Include special reinforcement required and openings through concrete structures.

B. Design Mixes Submit written reports of design mixes to the Architect of each proposed mix for each class of concrete within thirty-five (35) days after the issuance of the "Notice to Proceed", but no later than ten (10) days prior to the first scheduled concrete pour. Do not begin concrete production until all design mixes have been reviewed by the Architect and independent testing facility.

Separate submittal data shall be submitted for each mixture for the following:

1) Concrete Paving – Pedestrian, steps, curbs, walls and footings.

2) Concrete Paving – Vehicular.

C. Job-site Samples: Contractor shall pour concrete samples as indicated below for each concrete color and finish specified on Drawings for written approval from Owner’s Representative prior to installation as follows:

1. Two (2) foot by two (2) foot concrete flatwork.

2. Two linear feet by width and height detailed for each concrete wall specified to include decorative tile if specified.

PART 2 - PRODUCTS

2.1 FORM MATERIALS:

A. Forms for Exposed Finish Concrete: Unless otherwise indicated, construct formwork for exposed concrete surfaces with plywood, metal, metal-framed plywood faced or other acceptable panel-type materials, to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on drawings. Provide form material with sufficient thickness to withstand pressure of newly placed concrete without bow or deflection.

B. Forms for Unexposed Finish Concrete: Form concrete surfaces which will be unexposed in finished structure with plywood, lumber, metal or other acceptable material. Provide lumber dressed on at least 2 edges and one side for tight fit.

C. Form Coatings: Provide commercial formulation form-coating compounds that will not bond with, stain nor adversely affect concrete surfaces, and will not impair subsequent treatments.

D. Expansion Joint for flatwork that does not have a stamp pattern: Asphalt impregnated felt fiber expansion material, one half inch (1/2") thick by full depth of concrete, in compliance with ASTM D1751.

E. Expansion Joint for poured-in-place walls: Asphalt impregnated felt fiber expansion material, one half inch (1/2") thick by full depth of concrete, in compliance with ASTM D1751.

2.2 REINFORCING MATERIALS:

A. Reinforcing Bars (Rebar): ASTM A 615/A615M-22, Grade 60, deformed, except #3 and smaller may be Grade 40. Test in accordance with Section 1903A and 1910A.2, 2022 C.B.C., and conform to ACI 318-19.

B. Supports for Reinforcement: Provide support for reinforcement including bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcing bars and welded wire fabric in place.

2.3 CONCRETE MATERIALS:

A. Portland Cement: ASTM C 150, Type V, conforming to ACI 318-19 and test in accordance with Section 1903A, 2022 C.B.C.

B. Fly Ash or other pozzolan can be used as a partial substitute for ASTM 150 Portland cement as follows:

1. Fly Ash conforming to ASTM C618, Class F, the maximum Loss on Ignition (LOI) shall be less than 3%. Class C is not permitted.

2. Slag, Ground Granulated Blast Furnace Slag Cement (GGBFS) shall conform to ASTM C989 or AASHTO M 302 Grade 100 or 120.

3. Silica Fume: ASTM C1240, Standard Specification for Silica Fume used in cementitious mixtures.

4. High-Reactivity Metakaolin (HRM): ASTM C618, aluminosilicate pozzolan.

C. Water: Water used in mixing concrete shall be clean and free from injurious amounts of oils, acids, alkalis, salts, organic materials or other substances that may be deleterious to concrete or reinforcement and shall be tested and verified through ASTM C1602.

D. Admixtures: Admixtures certified by manufacturer to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material and to be compatible with

other admixtures and cementitious materials. Do not use admixtures containing calcium chloride.

1. Air-Entraining Admixture: ASTM C 260.
2. Water-Reducing Admixture: ANSI/ASTM C 494, Type A, and contain not more than 1% chloride ions.
3. High-Range, Water-Reducing Admixture: ASTM C 494, Type F
4. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E
5. Water-Reducing and Retarding Admixture: ASTM C 494, Type D

E. Crushed Aggregate Base Rock: Shall be coarse aggregate for regular weight concrete. Aggregate shall be hard, durable, uncoated, graded, cleaned and screened crushed rock or gravel conforming to current requirements of ASTM C33. Crusher-run stone or bank-run gravel will not be permitted.

F. Liquid Membrane-Forming Curing Compound: Liquid type membrane-forming curing compound complying with ASTM C-309, Type I, Class A unless other type acceptable to Architect. Comply with Volatile Organic Compounds (VOC) content limits, as required by Air Pollution Control Regulations on Architectural Coatings (less than 350 g/l).

G. Curing Methods:

1. Moist Curing: continuous misting, sprinkling or ponding.
2. Moisture-retaining cover curing: After wetting the concrete surface, cover with wet-curing blanket. Lay blanket in accordance with manufacturer's instructions, over-lapping edges and extending edges twelve (12) inches beyond area of concrete to be cured. Remove air pockets. Repair any holes or tears that occur using sheeting material and waterproof tape.
3. Compound curing: Apply specified curing compound as soon as final finishing operations are complete. Use as recommended by the manufacturer's written instructions.

H. Color Materials:

1. Liquid lamp black shall be defaulting color for concrete not specified on drawings as "Natural" or "Colored". Add one pint of liquid lamp black per cubic yard of exterior concrete.
2. Concrete specified as "Natural" shall have no color added.
3. Concrete specified as "Colored" shall be LM Scofield Systems Chromix Admixtures for Color-Conditioned Concrete and/or Scofield Integral Color SG Standard Grade, to include Standard Colors, Custom Colors and Special Order Colors for all concrete specified on drawing as "colored". Colored concrete shall be sealed per manufacturer with LM Scofield Cureseal-W with matte gloss finish, LM Scofield Cureseal-100 with glossy, wet-look, LM Scofield Lithochrome Colorwax concrete curing compound or equal as selected by Architect or Owner's Representative. Contractor shall pour samples on site as necessary for architect and/or owner's representative to select final color(s) for project.

2.4 PROPORTIONING AND DESIGN OF MIXES:

A. Prepare design mixes for each type and strength of concrete. Use an independent testing facility acceptable to Architect for preparing and reporting proposed mix designs. The testing facility shall not be the same as used for field quality control testing unless otherwise acceptable to Architect.

B. Comply with Section ACI 318-14. The compressive strength of concrete shall be proportioned by one of the following methods: Design Mix (Method B) or Pre-Test Mix (Method C).

C. Submit written reports to Architect of each proposed mix for each class of concrete at least 10 days prior to the first scheduled concrete pour. Do not begin concrete production until mixes have been reviewed by Architect.

D. Design mixes to provide normal weight concrete with the following properties:

1. Concrete Paving – Pedestrian, steps, curbs, walls and footings:
   a. 3,000 psi 28-day compressive strength
   b. 0.60, maximum, water to cement (W/C) ratio
   c. Minimum cementitious content shall be 470 pounds, minimum, per cubic yard.
   d. Aggregate to be 1" maximum.
   e. 28-day shrinkage, SEAONC Method: 0.050 maximum.

2. Concrete Paving – Vehicular:
   a. 4,000 psi 28-day compressive strength
   b. 0.50, maximum, water to cement (W/C) ratio
   c. Minimum cementitious content shall be 470 pounds, minimum, per cubic yard.
   d. Aggregate to be 1" maximum.
   e. 28-day shrinkage, SEAONC Method: 0.050 maximum.

E. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant; at no additional cost to Owner and as accepted by Architect. Laboratory test data for revised mix design and strength results must be submitted to and accepted by the Architect before using in work.

F. Admixtures: Use only as indicated by approved design mix.

G. Color Additive for concrete <u>not</u> specified as "colored": add one pint of liquid lamp black per cubic yard of all exterior concrete which will be visible when cured.

H. Color for concrete specified as "colored": Color mixture as determined by manufacturer in accordance with color selected and sealed per manufacturer recommendations.

I. Slump Limits: Proportion and design mixes to result in concrete slump at point of placement as follows:

All concrete: Shall be four (4) inches, plus or minus one (1) inch.

2.5 CONCRETE MIXES:

Ready-Mix Concrete: Comply with ASTM C94. Measure, batch and mix concrete materials and concrete according to ASTM C-94. Furnish batch certificates, indicating project identification, name and number, date, mixture type, mixing time, quantity and amount of water added for each batch discharged and used in the Work to the Architect.

2.6 SACK FINISH MORTAR

A. Mortar shall be composed of Portland cement, sand, and water proportioned and mixed as specified in this Section 51-1.135.

B. Mortar shall be furnished and placed in recesses and holes, on surfaces, under structural members, and at other locations specified in these specifications, the special provisions or shown on the plans.

C. The proportion of cement to sand, measured by volume, shall be one to two (1:2) unless otherwise specified.

D. Materials shall conform to the provisions in Section 90, "Portland Cement Concrete."

E. The maximum size of sand shall not be larger than 0.5 of the size of the recess, hole or space where the mortar is to be placed.

F. The mortar shall contain only enough water to permit placing and packing.

G. Concrete areas to be in contact with the mortar shall be cleaned of all loose or foreign material that would in any way prevent a bond between the mortar and the concrete surfaces and shall be flushed with water and allowed to dry to a surface dry condition immediately prior to placing the mortar.

H. The mortar shall completely fill and shall be tightly packed into recesses and holes, on surfaces, under structural members, and at other specified locations. After placing, all surfaces of mortar shall be cured by the water method as provided in Section 90-7, "Curing Concrete," for a period of not less than 3 days.

I. Keyways, spaces between structural members, holes, spaces under structural members and other locations where mortar could escape shall be mortar-tight before placing mortar.

J. No load shall be allowed on the mortar that has been in place less than 72 hours, unless otherwise permitted by the Engineer.

K. All improperly cured or otherwise defective mortars shall be removed and replaced by the Contractor at the Contractor's expense.

2.7 WATERPROOF MEMBRANE:

Rolled, self-adhering waterproof membrane, composed of nominally 56-millimeter-thick layer of polymeric waterproofing membrane on a heavy duty, four-millimeter thick, cross-laminated polyethylene carrier film laminated together, MEL-ROL, product of W. R. Meadows/Sea Tight, or equal conforming to A.R.E.M.A. Specifications Chapter 29, Waterproofing.

PART 3 - EXECUTION

3.1 FORMS:

A. Design, erect, support, brace and maintain formwork to support vertical and lateral loads that might be applied until such loads can be supported by concrete structure. Construct formwork so concrete members and structures are of correct size, shape, alignment, elevation and position.

B. Form removal shall comply with ACI 318 Section 26.11.2.

C. Design formwork to be readily removable without impact, shock or damage to cast-in-place concrete surfaces and adjacent materials.

D. Construct forms to sizes, shapes, lines and dimensions shown, and to obtain accurate alignment, location, grades, level and plumb work in finished structures. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts and other features required in work. Use selected materials to obtain required finishes. Solidly butt joints and provide backup at joints to prevent leakage of cement paste.

E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, reglets, recesses, and the like, to prevent swelling and for easy removal.

F. Provisions for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses and chases from trades providing such items. Accurately place and securely support items build into forms. Comply with ACI 318 Section 26.11.2.

G. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt or other debris just before concrete is placed. Retightening forms and bracing after concrete placement is required to eliminate mortar leaks and maintain proper alignment.

3.2 PLACING REINFORCEMENT:

A. Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars", for details and methods of reinforcement placement and supports, and as herein specified.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials which 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 at least minimum coverage for concrete protection. Arrange, space and securely tie bars and bar supports to hold reinforcement in position during

concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.

E. Where concrete is installed at door thresholds and/or transitions to building interior spaces, 24" length, #3 smooth rebar dowels shall be installed12" into the new concrete paving and 12" into the adjacent building structure, spaced at 18" on center with a minimum of two in each location. Epoxy to secure end of dowel set into building and lubricate end cast into new concrete paving.

F. Where concrete is installed at door thresholds of modular buildings with steel framing, #5 rebar shall be welded securely to building floor plate, extending 12" into new concrete paving, spaced 18" on center with a minimum of two at each door threshold. Lubricate end cast into new concrete paving.

G. Where concrete is installed adjacent to concrete walkways that are part of the building structural pad, 24" length, #3 smooth rebar dowels shall be installed12" into the new concrete paving and 12" into the adjacent building structure pad, spaced at 18" on center spacing. Epoxy to secure end of dowel set into building structural pad and lubricate end cast into new concrete paving.

3.3 EXPANSION AND CONTROL JOINTS:

A. Locate and install joints so as not to impair strength and appearance of the structure, and as acceptable to Architect.

B. Continue reinforcement across expansion and control joints or install smooth rebar dowels.

C. Control/score joints (for walkways, steps, ramps and curbs): Unless shown otherwise on plan, install ½" radius score joints evenly spaced at a maximum of eight feet in two perpendicular directions, continuous and one third the depth of the slab.

D. Control/score joints (for walls, steps and vertical surfaces): Unless shown otherwise on plan, install ½" radius score joints evenly spaced at a maximum of eight feet in on center. Align vertical wall score joints with horizontal paving joints whenever possible. Install ½" radius or chamfered edge at each side of joint as called for in drawings, continuous and 1 ½" in depth.

E. Expansion Joints (for walkways, steps, ramps and curbs): Unless shown otherwise on plan, install expansions joints where walkways meet existing or proposed structures and evenly spaced at a maximum of 24 feet in two perpendicular directions. Install ½" asphalt saturated felt expansion joint material 1/4" below the finish surface and continuously throughout the full depth of slab.

F. Expansion Joints (for walls, steps and vertical surfaces): Unless shown otherwise on plan, install expansions joints where walls meet existing or proposed structures and evenly spaced at a maximum of 24 feet in two perpendicular directions. Align vertical wall expansion joins horizontal paving joints whenever possible. Install ½" asphalt saturated felt expansion joint material ½" below the finish surface where ½" radius concrete edges are indicated and flush with base of chamfer were chamfer edges are indicated and continuously throughout the concrete section. Install ½" radius or chamfered edge at each side of joint as called for in drawings.

3.4 INSTALLATION OF EMBEDDED ITEMS:

A. General: Set and build into work anchorage devices and other embedded items required for other work that is attached to, or supported by, cast-in-place concrete. Use setting drawings, diagrams, instructions and directions provided by suppliers of items attached thereto.

B. Edge Forms and Screed Strips for Slabs: Set edge forms or bulkheads and intermediate screed strips for slabs to obtain required elevations and contours in finished slab surface. Provide and secure units sufficiently strongly to support types of screed strips by use of strike-off templates or accepted compacting type screeds.

3.5 PREPARATION OF FORM SURFACES:

A. Coat contact surfaces of forms with a form-coating compound before reinforcement is placed.

3.6 CONCRETE PLACEMENT:

A. Pre-placement Inspection: Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast-in, in accordance with ACI 318-08. Notify other crafts to permit installation of their work; cooperate with other trades in setting such work. Moisten wood dorms immediately before placing concrete where form coatings are not used.

B. Coordinate the installation of joint materials with placement of forms and reinforcing steel.

C. General: Comply with ACI 304, and as herein specified.

D. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as herein specified. Deposit concrete as nearly as practicable to its final location to avoid segregation.

E. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers not deeper than 24" and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.

F. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding or tamping. Use equipment and procedures for consolidation of concrete in accordance with ACI recommended practices.

G. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than visible effectiveness of machine. Place vibrators to rapidly penetrate placed layer and at least 6" in to preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing segregation of mix.

H. Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of construction (expansion) joints, until the placing of a panel or section is completed.

I. Consolidate concrete during placing operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners.

J. Bring slab surfaces to correct level with straightedge and strikeoff. Use bull floats or darbies to smooth surface, free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.

K. Maintain reinforcing in proper position during concrete placement operations.

L. Cold Weather Placing: Do not place concrete when air temperature is below 40 degrees F. or expected to fall below within 24 hours. Comply with ACI 306.

M. Hot Weather Placing: When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACI 305.

N. Concrete flatwork over-pour: Over-pour is excess concrete spilling beyond the limits of the concrete forms. Contractors shall remove over-pour to allow for installation of tree root barriers, irrigation and similar landscape improvements.

3.7 FINISH OF FORMED SURFACES:

A. Rough Form Finish: For formed concrete surfaces not exposed-to-view in the finish work or by other construction, unless otherwise indicated. This is the concrete surface having texture impaired by form facing material used, with tie holes and defective areas repaired and patched and fine and other projections exceeding 1/4" in height rubbed down or chipped off.

B. Smooth Form Finish: For formed concrete surfaces exposed-to-view, or that are to be covered with a coating material applied directly to concrete, or a covering material applied directly to concrete, such as waterproofing, damp proofing, painting or other similar system. For "as-cast" concrete surface obtained with selected form facing material, arranged orderly and symmetrically with a minimum of seams, repair and patch defective areas with fins or other projections completely removed and smoothed

C. Related Unformed Surfaces: At tops of walls, horizontal offset surfaces occurring adjacent to formed surfaces, strike-off smoothly and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.8 CONCRETE EXTERIOR FLATWORK FINISHES:

A. Float Finish: Apply float finish to concrete slab surfaces to receive trowel finish and other finishes as hereinafter specified.

B. After screeding, consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating when surface water has disappeared or when concrete has stiffened sufficiently to permit operation of power-driven floats, or both. Consolidate surface with power-driven floats, or by hand-floating if area is small or inaccessible to power units. Check and level surface plane to a tolerance not exceeding 1/8" in 10' when tested with a 10' straightedge. Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat the surface to a uniform, smooth, granular texture.

C. Round top edges of all exposed slabs, nosing, etc. with 3/8" radius edging tool, unless chamfered or otherwise noted.

D. Non-Slip Broom Finish (NSBrm-Fn): Unless specified otherwise, apply non-slip broom finish to exterior concrete walks, platforms, steps and ramps, and elsewhere as indicated. Slopes less than 6% shall have a medium broom finish. Slopes 6% and greater shall be heavy broom slip resistant. Concrete finish to be stable, firm and slip resistant per CBC Section 11B-302 and 11B-403.

E. Immediately after the trowel finishing, slightly roughen the concrete surface by brooming with fiber bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

3.9 CONCRETE CURING AND PROTECTION:

A. General: Protect freshly placed concrete from premature drying and excessive hot temperatures. Comply with ACI 305R-10, Guide to Hot Weather Concreting.

B. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting, keep continuously moist for not less than 7 days and above 50 deg. F.

C. Begin final curing procedures immediately following initial curing and before concrete has dried. Continue final curing for at least 7 days in accordance with ACI 301 procedures. Avoid rapid drying at end of final curing period.

D. Curing Method: Perform curing of concrete by moist curing, by moisture-retaining cover curing, by curing compound, and/or by combinations thereof, at contractor's option except as noted during hot weather.

E. Cold Weather Requirements: Protect concrete from freezing conditions during the first seven (7) days after placement.

F. Hot Weather Requirements: When hot weather conditions will cause an evaporation rate exceeding 0.2 pounds of water per square foot per hour, as determined by Figure 2.1.5 of ACI 305, cure for initial 24 hours minimum by moisture retaining cover methods.

3.10 REMOVAL OF FORMS:

A. Formwork not supporting weight of concrete, such as sides of beams, walls, columns, and similar parts of the work, may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 24 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form removal operations, and provided curing and protection operations are maintained.

3.11 RE-USE OF FORMS:

A. Clean and repair surfaces of forms to be re-used in work. Split, frayed, delaminated or otherwise damaged form facing material will not be acceptable for exposed surfaces. Apply new form coating compound as specified for new formwork.

B. When forms are extended for successive concrete placements, thoroughly clean surfaces remove fins and laitance, and tighten forms to close joints. Align and secure joint to avoid offsets. Do not use "patched" forms for exposed concrete surfaces, except as acceptable to Architect.

3.12 MISCELLANEOUS CONCRETE ITEMS:

A. Filling-In: Fill-in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place. Mix, place and cure concrete as herein specified, to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and steel-troweling surfaces to a hard, dense finish with corners, intersections and terminations slightly rounded.

C. Equipment and Enclosure Bases and Foundations: Provide machine and equipment bases and foundations, as shown on drawings. Set anchor bolts for machines and equipment to template at correct elevations, complying with certified diagrams or templates of manufacturer furnishing machines and equipment.

3.13 CONCRETE SURFACE REPAIRS

A. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removal of forms, when acceptable to Owner’s Representative.

B. Cut out honeycomb, rock pockets, voids over 1/4" in any dimension, and holes left by tie rods and bolts, down to solid concrete but, in no case to a depth of less than 1". Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, damp with water and brush-coat the area to be patched with a specified bonding agent. Place patching mortar, colored to match surrounding surfaces after bonding compound has dried. Surfaces exposed-to-view shall be sacked with colored mortar as directed by the Owner’s Representative.

C. Repair of Formed Surfaces: Remove and replace concrete having defective surfaces if defects cannot be repaired to the satisfaction of Owner’s Representative. Surface defects, as such, 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.

D. Flush out from tie holes, fill with dry pack mortar.

E. Repair concealed formed surfaces, where possible, that contain defects that affect the durability of concrete. If defects cannot be repaired, remove and replace concrete.

F. Repair of Unformed Surfaces: Test unformed surfaces, such as monolithic slabs, for smoothness and verify surface plane to tolerances specified for each surface and finish. Correct low and high areas as herein specified. Test unformed surfaces sloped to drain for trueness of slope, in addition to smoothness, using a template having required slope.

G. Repair finished unformed surfaces that contain defects, which affect durability of concrete. Surface defects, as such, include crazing, cracks in excess of 0.01" wide or which penetrate

reinforcement or completely through non-reinforced sections regardless of width, spalling, pop-outs, honeycomb, rock pockets, and other objectionable conditions. The color of repair shall match surrounding surface color.

H. Correct high areas in unformed surfaces by grinding, after concrete has cured at least 14 days.

I. Correct low areas in unformed surfaces during, or immediately after completion of surface finishing operations by cutting out low areas and replacing them with fresh concrete. Finish repaired areas to blend into adjacent concrete. Proprietary patching compounds may be used when acceptable to the Owner's Representative.

J. Repair methods not specified above may be used, subject to acceptance of Owner's Representative.

3.14 WATERPROOFING SITE RETAINING WALLS:

A. Contractor shall apply waterproof membrane to site retaining walls. Membrane shall continuously cover the surface in contact with soil, vertically from the footing to 2" above the finished grade level of the soil retained.

B. Prepare surface as recommended by manufacturers by filling cracks, priming, filling joint and voids, penetrations and corners.

C. Apply waterproof membrane as recommended by manufacturer.

3.15 SACK FINISH WALLS, STEP SEATING AND CURBS

A. Sack finish shall consist of filling holes or depressions in the surface of the concrete, repairing all rock pockets, removing fins, and removing stains and discolorations visible from traveled ways. Sack finish, unless otherwise specified, shall be considered as a final finish where designated on the plans and details.

B. Except as provided herein, form bolts and any metal placed for the convenience of the Contractor shall be removed to a depth of at least one inch below the surface of the concrete. All rock pockets and other unsound concrete shall be removed. The resulting holes or depressions shall be cleaned and filled with mortar. Form bolts projecting into the cells of box girders need not be removed unless deck forms are removed from the cells, in which case the bolts shall be removed flush with the surface of the concrete.

C. Mortar used to fill bolt holes shall conform to the provisions in this Section for "Mortar." Other depressions and pockets shall be filled with packed mortar as directed by the Architect and the mortar shall be cured in conformance with the provisions in this Section.

D. For exposed surfaces, integral concrete color (LM Scofield Chromix) cement shall be added to the mortar in an amount sufficient to result in a patch which, when dry, matches the surrounding concrete.

E. If rock pockets, in the opinion of the Architect, are of such an extent or character as to affect the strength of the structure materially or to endanger the life of the steel reinforcement, the Architect may declare the concrete defective and require the removal and replacement of the portions of the structure affected.

3.16 QUALITY CONTROL TESTING DURING CONSTRUCTION:

A. The Owner will employ a testing laboratory to perform other tests and to submit test reports.

B. Reinforcing steel shall be supplied with heat number and mill analysis per ACI 318-89.

C. Shrinkage Limitation: All concrete shall meet drying shrinkage limitations as follows:

D. 0.032 percent at age 21 days, with tolerance of +25% for specimens taken during the course of the work.

E. The use of aggregates with a proven history of compliance with the above limitations will be accepted as fulfilling this requirement. In the absence of satisfactory evidence, the laboratory shall prepare specimens (4" x 4" prisms 10" gage length, ASTM C-157-64T) and test for compliance prior to approval.

END OF SECTION

SECTION 321811 - PERFORMANCE PAD

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to the work of this Section.

1.2 DESCRIPTION OF WORK

A. Extent: Work in this section includes, but is not limited to, providing all labor, materials, and equipment necessary for the complete installation of the performance pad (referred to herein as the pad). Install the pad over entire stone base, as shown on the Drawings.

B. Related Work

1. Leveling Fines
2. Synthetic Turf System

1.3 DEFINITIONS

A. Relative compaction or compaction: is defined as the in-place dry density of the compacted soil divided by the laboratory compacted maximum dry density as determined by ASTM Test D1557 (Modified Proctor), latest edition, expressed as a percentage.

1.4 QUALITY ASSURANCE

A. Prospective bidders and/or installers of the performance pad shall be required to comply with the following:

1. The Contractor shall provide competent workmen skilled in pad installation. Sub-contract supervisory installation personnel are permitted as approved by the Architect.
2. The designated supervisory personnel on the project shall be certified by the manufacturers of the products as competent in the installation of these materials.
3. The manufacturers shall have these representatives on site to certify that the installation meets their specifications and standards.

1.5 SUBMITTALS

A. The successful bidder must submit to the owner’s representative, for the owner’s approval, the following items before the contract can be awarded.

B. Prior to the installation, the Contractor shall submit product data and a sample of all components of the pad system.

C. The Contractor shall provide, with the bid, a list of prior synthetic turf installations of similar types with pad, providing specific contacts and phone numbers.

PART 2 - PRODUCTS

2.1 PERFORMANCE PAD

A. Acceptable manufacturers / systems, or approved equal:

1. GeoFlo Shock Pad, 15/20mm, as available from Tencate.
2. Brock SP 14/17, available from Brock USA.
3. ProPlay Sport 20, available from Schmitz Foam.

2.2 LEVELING FINES

A. See section 320516 Leveling Fines for material and installation.

PART 3 - EXECUTION

3.1 JOB CONDITIONS

A. Existing rock base shall be completed as specified, and as shown on the Drawings.

B. Timing of pad installation shall coincide with synthetic turf installation. No more than 20 yards of field coverage shall be installed of the pad product prior to installing synthetic turf.

3.2 LEVELING FINES INSTALLATION

A. See Section 320516 Leveling Fines for material and installation.

3.3 PERFORMANCE PAD INSTALLATION

A. Install pad products per manufacturer’s instructions and as shown on the Drawings.

END OF SECTION 321811

SECTION 321813 - SYNTHETIC TURF SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to the work of this Section.

1.2 DESCRIPTION OF WORK

A. The work under this section includes, but is not limited to, the installation of the new (non-infilled) synthetic turf system, tufted and inlaid markings, perimeter termination, warranty, and maintenance equipment.

B. Related work includes but is not limited to:

1. Leveling Fines
2. Performance Pad

1.3 SUBMITTALS

A. Installation Qualifications: The synthetic turf sub/contractor shall demonstrate experience on at least five (5) installations of the proposed material in the last year. The synthetic turf manufacturer shall certify the designated supervisory personnel on the project. A letter on the manufacturer's letterhead shall be submitted affirming the sub/contractor as competent in the installation of the material, including seaming methods, inlaid markings, termination and proper installation of the product.

B. Synthetic Turf system: The Contractor shall submit two (2) 12"x12" samples of synthetic turf proposed for this contract for approval of all colors, seaming materials, and layout of the system. The samples shall be reviewed as the product intended for use on the field. Along with the samples, product data shall be supplied, including turf product data, turf layout shop drawings with field markings and any colors, logos, and lettering. If infill is required per turf manufacturer, provide product data and samples for approval.

C. Warranty: The Contractor shall submit a manufacturer's warranty listing an eight (8) year guarantee for all labor, materials, workmanship, and services for the synthetic turf system, as specified herein.

D. Testing and Quality Control: Submit a copy of the results certified by an independent testing laboratory for the following tests performed on the synthetic turf system: All testing must be completed no more than 90 days prior to the turf installation.

Yarn Denier	ASTM D-1577
Yarn Breaking Strength	ASTM D-2256

Yarn Melting Point	ASTM D-789
Pile Height	ASTM D-418
Pile Weight	ASTM D-418
Total Weight	ASTM D-418
Backing Perforations	ASTM D-418
Tuft Bind (without infill)	ASTM D-1335
Grab Tear Strength	ASTM D-1682
Impact Attenuation	ASTM F-355
Pill Burn Test	ASTM D-2859
Specific Gravity	ASTM D-792
Lisport	Wear test

E. Maintenance and Operating Data: Submit a copy of maintenance and operating data for the synthetic turf system. Provide descriptions of all equipment recommended for the maintenance, repair, and citing activities not recommended relative to the warranty. Include maintenance recommendations for; coverings for special events, small repair procedures, minor seam repair, discussion of the precautions to be practiced, general maintenance, and uses to avoid to protect the turf system.

F. Site Acceptance: As a part of this contract, this contractor shall be responsible to oversee the installation of the base and drainage and to comment on any problems or conflicts that may be discovered. Upon completion of the base work, submit a letter confirming the site inspection has been performed, noting any discrepancies, problems and/or conflicts. A summary of certification of the acceptance of the base planarity shall be submitted. Continuing with the installation of the synthetic turf (without submittal of a written acceptance by the synthetic turf Contractor) over the base shall be considered as an approval of the base by the synthetic turf Contractor.

G. Gmax Testing Report: Perform and submit after installation of the field. See 1.8 B, C, 3 for additional information.

1.4 STANDARD SPECIFICATIONS FOR LAYOUT AND RULES

A. All markings shall be performed using selected colors of turf materials.

B. All markings and layout shall conform to the requirements set by the National Federation of State High School Associations (NFHS). See also paragraph 2.7.

1.5 DELIVERY, STORAGE AND HANDLING

A. Packing and Shipping: Deliver products in original unopened packaging with legible manufacturers' identification. All materials shall be stored in a dry place out of the direct sunlight.

B. Bulk Materials: Deliver materials in clean, washed and covered trucks to eliminate contamination during transportation. On site stockpiling locations to be coordinated with the Owner. Stockpile only in areas free of debris and away from drainage routes. Cover all materials with plastic or geotextile if materials are to be stockpiled more than 48 hours.

C. Prior to the installation of any materials and immediately upon delivery of the synthetic turf system and components to the project site, the Contractor shall inspect/verify the following:
   1. Damaged or defective items.
   2. Appropriate turf pile height and roll lengths.
   3. Uniformity of perforations.
   4. Arrival of adhesives in sealed, dry containers.

1.6 FIELD SYSTEM HOLD HARMLESS

A. The contractor shall hold the Owner, Project Manager, and Field Consultant harmless from infringement of any current or future patent issued for the synthetic turf system, fibers, backings, including performance pad (as required), installation methods and vertical draining characteristics. The successful Proposer will be required to submit a letter for consent from their surety. Surety will indemnify the requirements.

1.7 FIELD DIMENSIONS AND LAYOUT

A. The Contractor will be responsible for furnishing, setting and marking all lines, seams and markings for the field. The Contractor shall at all times maintain all necessary benchmarks and control points to locate all events and markings.

1.8 WARRANTY OF SYNTHETIC TURF SYSTEM

A. General:
   1. The Contractor shall be required to issue a non-prorated guarantee for 100% of all labor, materials, workmanship, and services for the synthetic turf and markings for a period of eight (8) years, specified from a date of written acceptance of the work. This warranty will not be subject to pro-rating of the synthetic turf for any failure due to installation or materials. The turf surface wear will be determined by an independent consultant acceptable to all parties.
      a. The Owner will notify the contractor in writing of any issues that require remedial work on the field area.
      b. The Contractor shall respond to the notification within 48 hours of receipt and schedule any major defect or repair within 72 hours or as weather permits.
      c. The warranty requires that the contractor shall be required to perform all required repairs in a permanent and suitable manner as deemed necessary to maintain a safe playing condition at all times.
      d. The warranty requires that in case of any major repair or replacement, the contractor is to schedule such work as to not interfere with the Owner’s primary use or schedule.
      e. Any replacement or repair area shall match (as close as possible) the appearance of the existing turf.
      f. Failure to service the requirements of this warranty will be charge to the contractor.
      g. Any defect caused by delamination, peeling, normal abrasion or raveling that is not in original conformance with the testing specifications shall be repaired or replaced at no cost to the Owner during this guarantee period.
   2. In addition to the Contractor’s warranty, the contractor shall be required to submit the following documents in regard to the guarantee:

a. Provide an EIGHT (8) year warranty for the turf product from the manufacturer for all work performed under this contract.
b. Provide an EIGHT (8) year warranty for the fibers from the fiber manufacturer for all work performed under this contract.
c. Provide an EIGHT (8) year surfacing manufacturer and installer written guarantee for the synthetic turf.
d. Documents shall be submitted to the Owner prior to final payment.

3. The Contractor will be responsible for all tests that fail the specification. The Owner reserves the right to submit the surface to the above tests at any time during the length of the guarantee. Consideration will be given to the time and use of the surface.
4. This warranty does not cover excessive wear of the surface caused by misuse. The Owner will be given an instructions and caretaking procedures before final acceptance. This is to follow the maintenance guidelines as specified by the surfacing manufacturer.
5. The Warranty/Guarantee shall cover, in general, the usability of the turf system (and pad as required); accessories use characteristics and suitability of the installation. All items covered by the warranty are to be replaced or repaired with new materials, including installation at the sole expense of the warranting contractor for a period of eight (8) years to the Owner from the date of substantial completion. The field materials shall be guaranteed for the designated uses as follows:
   a. Marching Band
   b. Football
   c. Soccer
   d. Physical Trustees exercises
   e. Physical Trustees activities
   f. Lacrosse
   g. Field Hockey
   h. Rugby
   i. Pneumatic rubber tired maintenance and service equipment
   j. Pedestrian traffic and other similar uses
6. A principal of the applicable firm, duly authorized to make contracts, shall sign the turf contractor warranty. The term “contractor” contained herein means the firm furnishing the warranty. “Owner” is _____. If the turf manufacturer of the synthetic turf system is not the same entity as the contractor, the warranty shall be co-signed by the manufacturer and the installation contractor.

B. Form of Warranty of the Synthetic Turf System
1. Contractor hereby warrants to the Owner, subject to the limitations and conditions set forth below, that its synthetic turf system consisting of the synthetic turf described as _____, the shock-absorbing under-pad (if necessary) described as _____, and the adhesives used in the installation, are free from defects in material and workmanship and shall, for a period of eight (8) years from the date of acceptance by the Owner, remain serviceable for the activities as listed above.
2. Contractor warrants to the Owner that its synthetic turf materials shall not fade, fail, shrink, wrinkle or reflect excessive wear. Contractor shall, at their sole expense and cost, replace such areas of the synthetic turf system not performing to these standards for the life of the warranty.
3. Definitions:
   a. The term “not fade” in the context of this warranty shall mean that the synthetic turf material remain a uniform shade of green or the other colors installed with no significant loss of color as defined by not greater than 20% loss or shade reduction.

b. The term “not fail” or “excessive wear” as used in the context of this warranty shall mean that the length and weight of the face yarn or pile material in the synthetic turf surface shall not have been decreased by more than 8% per year according to ASTM D418, nor exceed 20% during the warranty period. In the event that the synthetic turf materials do not retain its fiber height or shock absorbency and is consequently no longer serviceable during the warranty period, the Contractor shall, at their sole expense, replace such portions of the system that are no longer serviceable.

c. The term “serviceable” in the context of this warranty shall mean that the synthetic turf material shall have a maximum ‘”G” force value according to Procedure A, B, or C of ASTM F355, not exceed 110 G’s at any location upon installation and shall not exceed 140 G’s thereafter throughout the life of the warranty period. This shall be determined by conducting dynamic cushioning tests at the six field locations as required per ASTM F355 procedures. “G” force factor values to be determined at 70 degrees F. Any increase from 110 G’s to allowable 140 G’s maximum shall be at a relatively uniform rate not to exceed 10 G’s in any single year.

4. Where applicable, the fabric shall adhere firmly and completely to the under pad or seaming tape over the entire warranty period.
5. Contractor warrants to the Owner that the permeable synthetic turf system shall drain vertically a minimum of 14 inches precipitation per hour for a maximum of 24 hours continuously, without visible surface ponding.
6. Contractor shall replace with new materials, at their sole expense, any damage to the synthetic turf system, which extends more than one meter beyond the location of foreign combustibles, which may ignite, and fire-damage the synthetic turf system. The Contractor shall not be held responsible for any incidental or consequential damages. These warranties and the Contractor’s obligations here-under are expressly conditioned upon;
   a. The Owner making all minor repairs to the synthetic turf system upon the discovery of the need for such repairs.
   b. The Owner maintaining and properly caring for the synthetic turf system in accordance with the Contractor’s maintenance manual and instructions.
   c. The Owner complying with the dynamic and static load specifications established by the Contractor.
7. The warranty is not to cover any defect, failure, damage or undue wear in or to the synthetic turf system caused by or connected with abuse, neglect, deliberate acts, acts of God, casualty, static or dynamic loads exceeding Contractor’s recommendations.
8. Contractor shall examine the synthetic turf system at least once per year or in regards to any claim that the Owner makes to be present at any time, to analyze the results of all tests conducted by the Owner or others, and to conduct such tests of their own. Contractor shall not be responsible for any costs or expenses incurred by the Owner or others with respect to such tests, except the Contractor shall pay for costs of all tests and analysis conducted or directed by their representative. The annual testing will be at the expense of the Contractor and the results delivered to the Owner within 60 days of the testing.
9. In the event the Contractor does not respond to the Owner’s written notice within 10 days of receipt of the notice or does not submit, schedule and execute corrective work within 60 days (weather permitting), the Owner has the option of having the work performed at the expense of the Contractor.
10. The Contractor will be given 7 days notice in the form of a certified letter notifying the Contractor of the end of the 60 day scheduling period.
11. Sample form of warranty herein set forth is a suggested for use for the work under this section. Manufacturers’ standard form of warranty may be used provided conditions specified herein are incorporated. All claims by the Owner under this warranty must be made in writing to the Contractor’s address within 30 days after the Owner learns of the

defect, giving rise to the claim. This warranty shall constitute a contract made in the State of California and shall be governed by the laws of that State.

PART 2 - PRODUCTS

2.1 SYNTHETIC TURF

A. The synthetic turf system shall be a vertically draining, permeable system consisting of a grass-like pile that shall be tufted into a double layer synthetic backing. The final coating shall be a polyurethane based material. All components must utilize North American extrusion. No materials in relation to yarn can come from overseas (Europe, Asia, Vietnam, China, etc) All yarns must be extruded in North America, and all raw polymers secured and produced in North America.

B. The synthetic turf shall be per section 2.05 and 2.06. Approved systems:
   1. Tencate Pivot. Contact: Robert Belleci, 925-864-2839. R.belleci@tencategrass.com
   2. Sporturf PurePlay 100. Contact: Greg Holloway, 706-671-0029. Greghollowa y@sporturf.com
   3. Astroturf 3D3 100oz. Contact Dominick Berarducci, 559-612-9065. Dominick.bararducci@astroturf.com

C. The entire system shall be resistant to weather, insects, rot, mildew, fungus growth and be non-allergenic and non-toxic. The entire system shall be constructed to maximize dimensional stability, to resist damage and normal wear and tear from its designated uses and to minimize the ultra-violet degradation.

D. Include all labor, materials, equipment, transportation and services to install the complete, all-weather synthetic turf system.

2.2 DYNAMIC CUSHIONING REQUIREMENTS OF THE SYNTHETIC TURF SYSTEM

A. See paragraph 1.8 B, 3, c.

2.3 PERMEABILITY REQUIREMENTS OF THE SYNTHETIC TURF SYSTEM

A. The combined turf system and pad shall drain vertically at a minimum of 14 inches of precipitation per hour for 24 hours continuously, without visible surface ponding.

2.4 SYNTHETIC TURF PILE SURFACE

A. The pile surface shall provide good traction in all types of weather with the use of conventional “sneaker type shoes” and composition, molded sole athletic shoes. The pile surface shall be suitable for both temporary and permanent line. Markings and permanent markings using a rubber base paint where applicable.

2.5 SYNTHETIC TURF SYSTEM MATERIAL COMPONENTS

A. Pile fibers shall resemble freshly grown, natural grass in appearance, texture and color (except for the color turf for markings).

B. Fibers shall be a combination of parallel slit film fibers and semi-textured and textured monofilament fibers.

C. The fibers are tufted through a two layer (one woven and one non-woven) synthetic backing material. K29 backing required.

D. The final coating, or secondary backing, shall be a moisture cured polyurethane. This backing shall be not less than 20 ounces. Latex backing material is not acceptable. The secondary backing, or polyurethane coating, shall be uniform and monolithic when cured.

E. If sewn, all turf seams shall be constructed of reinforced backing material or sewn with high strength polyester fiber cord. Sewn seams shall be a “double loop stitch” (bagger seams are not acceptable) type seam.

F. All glued seams shall have a 12” wide seaming tape of nylon or Mylar, fully coated with adhesive. All seams shall not have any adhesive applied to any exposed fibers. All graphics or markings can be factory tufted or field inlaid. No sheared, or shaved, inlaid markings shall be allowed, only cut in.

G. All turf shall be perforated for drainage after the final backing coating. The perforations shall be not less than 1/4” in diameter and have a uniform spacing of not more than 4” on center. Perforations shall be complete and full diameter for a minimum of 95% of each roll.

H. Any on-site perforations are to be inspected prior to installation of the product.

I. The turf shall be constructed and installed in minimum widths of 15 feet with no longitudinal or transverse seams, except for inlaid lines with a finished roll assembly. The seams shall be 15’-0” apart. Rolls that do not comply with the proper length or conform to the seaming diagram as submitted prior to the installation, shall be rejected from the site. No fitted pieces will be allowed to true alignment.

2.6 TURF PERFORMANCE AND TEST REQUIREMENTS

1.	Melting Point	ASTM D789	128 degrees C.
2.	Specific Gravity	ASTM D792	.950 to .960
3.	Breaking Strength	ASTM D5034	Length 274 lbs./ft. Width 395 lbs. /ft.
4.	Coefficient of Friction	ASTM D5034	Dry 1.15 Wet 1.00
5.	Pill Burn Test	ASTM D2859	8 Passed/0 Failed
6.	Tuft Bind (without infill)	ASTM D1335	9 lbs./sq.ft.
7.	Pile Height	ASTM D418	1.25” minimum, finished
8.	Fiber Face Weight	ASTM D418	100 oz./sq. yard total
9.	Gauge Width	ASTM D418	3/8”
10.	Fiber Thickness	ASTM D418	Slit film: 100 microns min Monofilament 145 microns min

11.	Secondary Backing	ASTM D418	20 oz. Non-filled Polyurethane (CLEAR)
12.	Primary Backing		CRB Polyester/Polypropylene/Mattex Fabrics, or equal
13.	Total Product Weight:		125 oz/sy minimum

2.7 LINES AND MARKINGS

A. All lines and markings shall be installed as shown on the Drawings, and shall include all incidental markings required by the NFHS that may not be shown on the Bid and Shop Drawings.

B. All lines and markings shall be uniform in color, providing a sharp contrast with the turf color and shall have sharp and distinct edging. Markings shall be true and shall not vary more than 1/2" from specified width and location. Manufacturer is to guarantee that the synthetic fiber is adaptable to painted lines.

2.8 ADHESIVE MATERIAL

A. Adhesive material to adhere the synthetic turf shall be:
1. 34-G adhesive as manufactured by Synthetic Surfaces, Inc. of Scotch Plains, NJ.
2. StaBond (one part adhesive), By StaBond adhesive, Gardena, CA.
3. Mapai Ultrabond PU 1K(single component), Mapai, Deerfield Beach, FL.
4. The adhesive shall be applied at the rate not to exceed 60 square feet per gallon.

B. The adhesive shall have the same warranty period as the synthetic turf system. All adhesives used in bonding the system together shall be resistant to moisture, bacterial and fungus attacks, and resistant to ultra-violet rays at any location upon installation.

2.9 INFILL

A. Provide any turf infill as required for the submitted systems to maintain performance and warranty. Infill is not required.

PART 3 - EXECUTION

3.1 OWNER TESTING

A. The Owner reserves the right to submit any material, either before or after installation to any testing it deems necessary to satisfy the conditions of this contract.

B. Any material tested and found not in compliance with the contract will be rejected and replaced with material conforming to the specifications. This will be done at the sole expense of the contractor.

C. Any testing performed by the Owner will be at the Owner's expense. The contractor is responsible for the cost of all testing that fails.

3.2 TURF INSTALLATION

A. Perform all work in strict accordance to the drawings, shop drawings and manufacturer's specifications and instructions.

B. Verification: The Contractor is responsible for the inspecting, verifying and completing all installed work of this section.

C. Weather Permitted Conditions: The Contractor shall not perform any work if any of the following conditions exist;

1. Ambient air temperatures are below 45 degrees F.
2. Material temperature falls below 45 degrees F.
3. Rain is forecast or falling
4. Conditions exist or are pending that will be unsuitable to the installation of the system.

D. Seams:

1. All panel seams shall be securely sewn using a double stitch bagger seam and/or glued to a backing material of nylon or mylar.
2. All panel seams spacing are to be held to a minimum of 15 feet unless prior approval of seaming diagram indicates a lesser panel.
3. All inlaid areas shall have full fastenings and no loose areas. At no time can pulling on the section separate the material.
4. All seams and inlaid areas shall be brushed thoroughly.

E. Turf Edges and Termination: All edges and ends of the turf shall be secured to the perimeter nailer. This termination shall be as detailed in the drawings and specifications. The turf shall be attached directly to the nailer utilizing galvanized fabric studs, placed at 8" intervals. The contractor shall submit a shop drawing of this termination detail prior to any work on the site.

F. Infill: Install any required infill as needed and specified per the turf manufacturer.

3.3 LINES, MARKINGS, AND INLAID TURF

A. See drawings for locations, widths, and colors of lines, inlaid turf, and (if applicable) logos.

3.4 GROOMING

A. After installation of the turf, all the lines, and perimeter termination, the Contractor shall groom the entire surface, slowly and deliberately. The speed of the grooming operation shall be no more than 2 miles an hour, to properly blossom the turf fibers and remove any wrinkles. Grooming shall be done with a minimum of 5 passes.

3.5 SURPLUS MATERIALS

A. Supply the additional following materials upon completion of installation:

1. Remnant turf material as accepted by the Owner.

2. Fifty linear feet of primary line color in 4-inch width.
3. Ten linear feet of secondary line color, logo and lettering colors in 4-inch width.

3.6 TRAINING

A. Provide one four-hour onsite training session for the Owner's maintenance staff for proper use of new or existing field maintenance equipment and proper long-term maintenance of synthetic turf system for warranty compliance. Training session shall be coordinated through the Owner. Installer shall provide a small field utility vehicle suitable for towing maintenance equipment to demonstrate how equipment works for training session.

3.7 FINAL INSPECTION, SITE PROTECTION, AND GENERAL CLEANUP

A. Final inspection: Once installation is complete, the entire surface shall be inspected, with particular attention to seams and edge attachments, by the Contractor, Project Inspector, Owner and Architect. Corrections shall be noted and rectified prior to Substantial Completion. Lines shall be checked for straightness, correctness and installation. Each sport lines and correct dimensions shall be verified. Entire area shall be checked for wrinkles, and planarity deficiencies.

B. The Contractor shall take special care to protect all field and stadium structures and utilities

C. The site shall be kept clean and free of debris throughout the installation. Empty barrels, sacks, bags, and remnant materials shall be appropriately and legally stored or disposed of daily. Usable remnant materials of turf shall become property of the Owner. Store as directed by the Owner.

D. After completion of the entire project, all debris remaining that is not a part of the final project shall be removed from the site.

END OF SECTION 321813

SECTION 321823 - SYNTHETIC TRACK SURFACE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to the work of this Section.

1.2 DESCRIPTION OF WORK

A. Extent: Work in this section includes, but is not limited to, providing labor, materials, and equipment necessary to install a durable, resilient, all-weather track surface as shown on the Drawings, which may be placed over an impervious base of asphalt or concrete.

B. Related Work:
1. Synthetic Track Surface Warranty and Guarantee
2. Track Asphalt Concrete Paving
3. Concrete Paving

C. The synthetic surfacing contractor shall refer to the drawings for the required locations of synthetic track surfacing to be installed. All quantities and dimensions shall be field verified by the synthetic surfacing contractor.

1.3 PRODUCT DESCRIPTION

A. The new track system shall be a polyurethane synthetic surfacing system consisting of SBR Rubber and a single-component polyurethane base, below a poured-in-place, two-component U.V. stabilized elastomeric polyurethane wearing layer with an embedded textured finish. The result is a durable, resilient, self-sealing, impermeable all-weather surface. This product is also known as a Sandwich system.

B. Colors:

1. Track Oval Color: Red

1.4 ADDITIONAL SCOPE OF WORK

A. Layout and paint all track lines and event markings to match existing.

1.5 COORDINATION

A. The synthetic surfacing contractor shall coordinate the work specified with an authorized and appointed representative of the owner so as to perform the work during a period and in a manner acceptable to the owner.

1.6 CONTRACTOR QUALIFICATIONS

A. The synthetic surfacing contractor must have a minimum of five years of experience in the installation of the specified synthetic track surfacing.

B. The polyurethane manufacturer must have a minimum of 10 years of experience with compound two-part polyurethane for athletic surfaces.

C. The supervisor for the installation must have installed a minimum of 5 specified tracks within the last 3 years. A reference list shall be submitted.

1.7 SUBMITTALS

A. The standard specifications of the synthetic track surfacing system specified herein, including all material quantities and sizes.

B. An affidavit attesting that the synthetic track surfacing material to be installed meets the requirements defined by the manufacturer's currently published specifications and any modifications outlined in those technical specifications.

C. A synthetic track surfacing sample, 6" x 6" in size, color, texture, thickness, etc. of the synthetic track surfacing system specified herein.

D. A list of completed facilities, including the installing supervisor, of the synthetic track surfacing system specified herein.

PART 2 - PRODUCTS

2.1 GENERAL

A. Products are as specified in Part 1 and Part 3 of this section.

PART 3 - EXECUTION

3.1 PLANARITY AND SLOPE

A. See section 321223 Track AC paving for planarity and slope conformance.

3.2 MATERIALS

A. The elastomeric polyurethane shall be a two-component U.V. stabilized elastomeric polyurethane compounded from polyol and isocyanate components, based on one hundred percent Methylene Diphenyl Isocyanate (MDI). No Toluene Diisocyanate Isocyanate (TDI) will be allowed. The color shall be per section 1.03 B.

B. The EPDM granulates shall be 1 to 3mm size, peroxide cured. The color shall be per section 1.03 B. EPDM suppliers shall be Melos, Gezolan, or approved equal.

C. The base mat rubber granulates shall be Styrene Butadiene Rubber (SBR) processed ground to a graded size of 1-3mm. A maximum of 80%, by weight, of the SBR shall be allowed in the paved-in-place base mat layer.

D. The single component polyurethane binder shall be a minimum of 20%, by weight, of the paved-in-place base mat layer.

E. System shall be as supplied by:

1. Beynon Sports Surfaces
2. Stockmeier Stobitan
3. Hellas Epiq Tracks
4. Approved equal.

3.3 INSTALLATION

A. The Synthetic Track Surfacing System components shall be processed and installed by specially designed machinery and equipment. A mechanically operated paver with variable regulated speed and thermostatically controlled screed shall be used in the installation of the base mat. The wearing course shall be installed using automatic electronic portioning, which provides continuous mixing and feeding for an accurate, quality controlled installation.

B. Base Course: The SBR granules and polyurethane shall be mixed together on site to regulate the ratio/quantity of SBR, not to exceed 80% in the base mat portion of the system. The single component polyurethane binder shall be mixed with the SBR rubber so that a minimum of 20%, by weight, exists in the final mixture. This mixture is then mechanically installed using the paver.

C. Seal Coat: The granular layer shall be sealed with a thickened two-component polyurethane, squeegee applied to ensure an impermeable base layer.

D. Wearing Course: The 1 to 3mm EPDM granules shall be integrated into poured-in-place U.V. stabilized elastomeric polyurethane to achieve the full depth of the 5 mm wearing course. The resilient embedded textured finish shall be a dense matrix of exposed EPDM granules. The homogeneous wearing course shall be applied in situ with the base course.

E. Installation shall not take place if adjacent or concurrent construction generates excessive dust, abrasives or any other by-product that, in the opinion of the installer, would be harmful to the track material, until completion of such works.

F. If, in the opinion of the installer of the synthetic material, the weather and/or climatic conditions are detrimental to the proper installation of the surfacing materials, work shall be delayed until conditions are acceptable. Preferred installation temperature is fifty degrees Fahrenheit and rising. Installation shall be executed only in dry conditions.

G. Total synthetic track thickness shall not be less than 14mm.

3.4 PERFORMANCE STANDARDS

A. The new synthetic track surfacing system shall exhibit the following minimum performance standards:

1. Thickness: ≥ 14mm
2. Force Reduction: 35 to 50%
3. Modified Vertical Deformation: 0.6 to 1.8mm
4. Friction: ≥ 47 TRRL Skid Resistance
5. Tensile Strength: ≥ 0.5 MPa
6. Elongation at Break: ≥ 40%

END OF SECTION 321823

SECTION 321826 - SYNTHETIC TRACK MARKINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to the work of this Section.

1.2 DESCRIPTION OF WORK

A. Extent: Work in this section includes, but is not limited to, providing labor, materials, and equipment necessary for installing all Synthetic track markings as shown, or called out, on the Drawings and specified herein.

B. Markings
   1. The oval track and the field events shall be marked and striped as required by NFHS (National Federation of State High School Associations). The track shall be marked for 42" lanes on the curves and straight-aways, or as shown on the Drawings.

C. Related work
   1. Synthetic Track Surfacing
   2. Synthetic Track Surface Warranty and Guarantee

1.3 QUALITY ASSURANCE

A. Submittals
   1. Track marking layout: Contractor shall submit a completed layout drawing for approval prior to commencing with painting (coordinate with Owner to verify requirements).
   2. Track striping shall be done by an experienced contractor, who specializes in track work. All required submittal drawings and calculations shall be completed by this specialty sub-contractor.

PART 2 - PRODUCTS

2.1 PAINT

A. Paint shall be that material as recommended by the manufacturer of the track surface.

B. No thinners shall be used.

PART 3 - EXECUTION

3.1 LAYOUT

A. Locate and confirm radius points.

B. Establish and set all necessary control points.

3.2 SYMBOLS

A. All lanes and lines shall be white 2" wide markings.

B. Track name letters shall be not less than 42" high, or as shown on the Drawings.

3.3 PAINT

A. No painting shall be performed when the velocity of the wind exceeds twelve miles per hour (12 mph), unless the spray equipment is equipped with the proper air curtains.

B. All markings shall receive two (2) coats of paint to achieve the full opaque results.

END OF SECTION 321826

SECTION 321829 - SYNTHETIC TRACK SURFACE WARRANTY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to the work of this Section.

1.2 DESCRIPTION OF WORK

A. The Contractor shall be required to guarantee all labor, materials, workmanship and services for the Synthetic Track Surface and Track Markings.

B. The Contractor shall be required to guarantee all other work under this contract for a period of five (5) years.

C. The guarantee for the surface system shall remain in force for a period of not less than FIVE (5) YEARS from the date of written acceptance of the work.

D. Any defects caused by delamination, peeling, normal abrasion or raveling that is not in original conformance with the testing specifications shall be repaired or replaced at no cost to the Owner during this guarantee period.

E. The term “Contractor” contained herein shall mean the firm that is furnishing the warranty.

1.3 QUALITY ASSURANCE

A. The Contractor shall be required to submit the following documents in regard to the guarantee:

1. Provide a one (1) year Performance Bond for all work performed under this contract.
2. Provide a two (2) year Maintenance Bond for all work performed under this contract.
3. Provide a five (5) year surfacing manufacturer/installer written guarantee.

Documents shall be submitted to the Owner/Architect prior to final payment.

B. The Contractor will be responsible for all tests that fail the specification. The Owner reserves the right to submit the surface to the above tests at any time during the length of the guarantee. Consideration will be given to the time and use of the surface.

END OF SECTION 321829

SECTION 321900 - SITE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to the work of this Section.

1.2 DESCRIPTION OF WORK

A. Extent: Furnish all labor, material, equipment, tools, and incidentals necessary for the installation of plain Site Concrete, including where reinforced, as shown on the Drawings and as specified in this Section.

B. Related work includes but is not limited to:

1. Earthwork and Grading
2. Aggregate Base

1.3 STANDARDS AND DEFINITIONS

A. Unless otherwise shown or specified all materials and methods shall conform to the appropriate current sections of the State of California, Department of Transportation Standard Specifications (Caltrans Standard Specifications) as they reasonably apply to this work, except for measurement and payment requirements.

B. Portland Cement Association, Design and Control of Concrete Mixtures, latest edition.

C. American Concrete Institute (ACI) specifications, latest editions, including:

1. ACI 211.1 Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete
2. ACI 301 Specifications for Structural Concrete
3. ACI 302 Guide to Concrete Floor and Slab Construction
4. ACI 304 Guide for Measuring, Mixing, Transporting and Placing Concrete
5. ACI 318 Building Code Requirements for Structural Concrete
6. ACI 347 Guide to Formwork for Concrete

D. Applicable ASTM International Standards (latest revisions) as they apply to this work and related test methods, including:

1. A615 Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
2. A1064 Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
3. C33 Specification for Concrete Aggregates

4. C39 Test Method for Compressive Strength of Cylindrical Concrete Specimens
5. C94 Specification for Ready-Mixed Concrete
6. C114 Test Methods for Chemical Analysis of Hydraulic Cement
7. C131 Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
8. C136 Test Method for Sieve Analysis of Fine and Coarse Aggregates
9. C143 Test Method for Slump of Hydraulic-Cement Concrete
10. C150 Specification for Portland Cement
11. C157 Test Method for Length Change of Hardened Hydraulic-Cement Mortar and Concrete
12. C171 Specification for Sheet Materials for Curing Concrete
13. C173 Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method
14. C260 Specification for Air-Entraining Admixtures for Concrete
15. C309 Specification for Liquid Membrane-Forming Compounds for Curing Concrete
16. C311 Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans for Use in Portland-Cement Concrete
17. C330 Specification for Lightweight Aggregates for Structural Concrete
18. C494 Specification for Chemical Admixtures for Concrete
19. C618 Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
20. C778 Specification for Standard Sand
21. C881 Specification for Epoxy-Resin-Base Bonding Systems for Concrete
22. C920 Specification for Elastomeric Joint Sealants
23. C979 Specification for Pigments for Integrally Colored Concrete
24. C989 Specification for Slag Cement for Use in Concrete and Mortars
25. C1240 Specification for Silica Fume Used in Cementitious Mixtures
26. C1602 Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete
27. C1603 Test Method for Measurement of Solids in Water
28. D1751 Specification for Preformed Expansion Joint Filler for Concrete Paving
29. D1883 Test Method for California Bearing Ratio (CBR) of Laboratory-Compacted Soils

E. California Air Quality Management District (AQMD) Rule 1113 Volatile Organic Compound (VOC) Limits.

F. California Building Code (CBC), Part 2 of California Code of Regulations, Title 24: Walking surface finishes are to comply with accessibility provisions of the CBC, applicable edition.

1.4 QUALITY ASSURANCE

A. Layout Review: Stake and layout all site concrete installations for review by the Owners Representative prior to excavation.

B. Inspection: Notify the Owners Representative 24 hours prior to placement of any concrete to inspect sub-grade, forms, and reinforcement.

C. Substitutions: shotcrete / gunite will not be permitted as a substitute for cast-in-place concrete.

1.5 SUBMITTALS

A. Product data:

1. Steel reinforcement (mill certificates) / expansion joint filler, reinforcement.

B. Concrete Mix: Proposed mix design of each class of concrete, indicating name of batch plant, date and # of mix design, project location, Contractor requesting delivery.

1. Mix design: state the following:

a. Proportions of all materials used
b. Compressive strength in PSI at 28 days.
c. Slump
d. Water-cement ratio
e. Color, if applicable

2. Slump Test Data in support of submitted concrete mix
3. Cylinder Report in support of submitted concrete mix
4. Strength Performance Reports per ASTM C39 and ACI 301 of submitted concrete mix
5. Sieve data / certification for coarse and fine aggregate
6. Test report / certification for cement and fly ash.
7. Admixture data.
8. Water test report for ready mix concrete.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store materials in a dry and protected location. Protect reinforcing steel, dowels, and welded wire mesh from rusting, deformation, staining, and moisture damage.

1.7 TESTS

A. Testing and analysis of concrete will be performed under provisions of Caltrans Standard Specifications Section 6-3.

B. Testing firm shall take cylinders and perform slump, compression strength, and air entrainment tests in accordance with ASTM C143, C39 and C173.

1. Testing shall be carried out for vertical surfaces equal to or greater than 48” as measured from bottom of footing to top of wall, and for vehicular concrete subject to increased loading conditions such as stress pads.
2. All testing shall be at no additional cost to the Owner.

1.8 DSA-TESTS

A. Testing and analysis of structural concrete will be performed under the requirements of Division of the State Architect, DSA-103, latest edition.

PART 2 - PRODUCTS

2.1 FORMWORK AND REINFORCEMENT

A. Formwork: Steel or wood, of size and strength to resist movement during concrete placement and to retain straight, true, and to proper elevation, horizontal and vertical alignment until removed. Use forms that are straight and free of distortion and defects. Use flexible spring steel forms or laminated boards to form radius bends as required.

1. Form lumber: #2 or better grade wood. Do not use used form lumber.

B. Reinforcement Bars and Dowels: ASTM A615. Clean and free of paint, grease, oils, and loose rust scale. Deformed steel bars, Grade 60 for bars #5 and larger; Grade 40 minimum for bars #4 and smaller.

1. Tie Wire: 16-gauge plain cold-drawn steel conforming to ASTM A1064, clean and free of rust, dirt, grease or oils.
2. Supports: bolsters, chairs, dobies, spacers and other devices for spacing, supporting and fastening reinforcing bars in place.
3. Sleeves: for doweling across expansion joints and cold joints: Sika Speed Dowel or equal, sized for round dowel diameter and length.

C. Welded Wire Mesh: Welded plain cold-drawn steel wire fabric, ASTM A1064 by Davis Wire Corporation or approved equal. Clean and free of paint and rust. Furnished in flat panels, not rolls.

1. Supports: Chairs or dobies to support welded wire mesh reinforcement at half the depth of the paving.

D. Form-release: form release agent, California AQMD Rule 1113 VOC-limits compliant.

2.2 CONCRETE

A. Cementitious Materials:

1. Portland Cement: ASTM C150. Type-II. Use single source throughout entire project.
2. Fly Ash: ASTM C618 & C311. Class C, F, or N.
    a. Source fly ash from an experienced producer, conforming to all applicable standards.
    b. At no time during the course of the project will a change of fly ash source (plant) be permitted without the prior written consent of the Owners Representative.
3. Slag: ASTM C989 if specified in the concrete mix design.

B. Coarse Aggregate: ASTM C33 and Caltrans Standard Specifications Section 90. Gravel, crushed gravel, crushed rock, or combinations thereof, free from organic matter and other deleterious substances, from an approved source. Use single source throughout entire project.

C. Fine Aggregate: ASTM C33 and Caltrans Standard Specifications Section 90. Natural sand or a combination of not less than 50% natural and manufactured sand, free from deleterious coatings,

roots, bark, sticks, rags, and other extraneous material. Thoroughly and uniformly washed. Use single source throughout entire project.

D. Water: ASTM C1602, clear and free from injurious amounts of oil, salts, acid, alkali, organic matter, or other deleterious substances. For ready-mix concrete water density shall be monitored with an automated device conforming to ASTM C1603.

E. Chemical Admixtures:

1. All admixtures: California AQMD Rule 1113 VOC-limits compliant
2. Air Entraining: ASTM C260. Use five percent (5%) air entrainment: Manufactured by BASF, Sika, W.R. Grace or approved equal.
3. Water Reducing / Plasticizer: ASTM C494, manufactured by BASF, Sika, W.R. Grace or approved equal.
4. Shrinkage Reducing: ASTM C494. Capable of reducing drying shrinkage up to 80% at 28 days per ASTM C157, BASF, W.R. Grace or approved equal.
5. Accelerating: ASTM C494, non-corrosive admixture manufactured by BASF, W.R. Grace or approved equal.
6. Hydration Controlling: ASTM C494, Type B, and Type D by BASF, or approved equal.
7. Calcium chloride is not permitted in the manufacture of chemical admixtures.
8. Admixtures batched, mixed and transported in accordance with ASTM C94

F. Cure: ASTM C309 Type 1, Class A&B, California AQMD Rule 1113 VOC-limits compliant, clear membrane curing compound, by W.R. Meadows, L.M. Scofield, or approved equal.

1. Do not use white liquid membrane curing compound.
2. For colored concrete, see clause on Concrete Colors in this Specification for cure-sealers that are applied to freshly placed concrete. Do not use this cure.

2.3 CONCRETE MIX DESIGN

A. Concrete mix: conform to applicable industry standards for concrete materials, admixtures, bonding materials, curing and other except as noted.

1. Concrete mixes shall be properly proportioned for yield.
2. Water / cement ratio: 0.50 max unless otherwise approved by the Owners Representative
3. Slump: maximum four (4”) inches. A tolerance of up to one (1”) inch above the maximum indicated is allowed for one batch in any five consecutive batches tested.

B. Strength: ASTM C39 designated by class based on 28-day compressive strengths when tested:

1. Class-2 (590 lbs of cementitious material per cubic yard) for curbs, footings, and all above-grade structures unless otherwise noted. Minimum compressive strength of 3000 PSI at 28-days.
2. Class-3 (505 lbs of cementitious material per cubic yard) for all sidewalks, pavements, sub-pavements, and sub-slabs unless otherwise noted. Minimum compressive strength of 2500 PSI at 28-days.

C. Fly Ash: Incorporation of fly ash into the concrete mix is at the Contractor's discretion. If fly-ash is to be used in the mix, substitute up to 25% of Portland cement with fly ash for all classes of concrete, final proportions to be determined by the concrete supplier.

1. Concrete mixtures with fly ash must be properly designed for the application, and finishing procedures must be appropriately applied.

D. Slag: Incorporation of slag into the concrete mix is at the Contractor's discretion. If slag is to be used in the mix, substitute up to 25% of Portland cement with slag for all classes of concrete, final proportions to be determined by the concrete supplier.

1. Concrete mixtures containing slag cement should be proportioned according to ACI 211.1, be properly designed for the application, and finishing procedures must be appropriately applied.

E. Chemical Admixtures

1. Concrete mixes for walls and/or structures equal to and over 4'-0" in height: do not include Air Entraining Mixtures.
2. Concrete mixes for walls and/or structures equal to and over 4'-0" in height: include Water Reducing Admixtures.
3. Chemical admixtures: at the Contractor's discretion or the mix design submitted by the concrete ready-mix supplier, with the two exceptions noted above.
4. Chemical admixtures: specified within the range of the manufacturer's recommended concentration.

2.4 CONTROL JOINTS

A. General: All adhesives, fillers, sealants: California AQMD Rule 1113 VOC-limits compliant

B. Expansion joint filler: ASTM D1751, 3/8" thick asphalt impregnated fiberboard, by W.R. Meadows or approved equal.

PART 3 - EXECUTION

3.1 JOB CONDITIONS

A. Weather Conditions: Construct concrete paving only when atmospheric temperature is above 40 degrees F., when the underlying base is dry, and when weather is not rainy.

B. Grade Control: Establish and maintain the required lines and grades, including cross-slope during construction operations.

C. Protection: Take all steps necessary not to discolor or damage existing improvements. If damage occurs, repair immediately and if repair cannot be made to the satisfaction of the Owners Representative, remove and replace at no expense to the Owner.

3.2 SITE PREPARATION

A. Verify that aggregate base preparation and elevations conform to the Project requirements and Specifications. Do not install work specified in this Section prior to acceptance of aggregate base.

B. Clear aggregate base surface of all loose or unsuitable material.

3.3 INSTALLATION

A. Form Construction: Set forms to the required grades and lines, rigidly braced and secured; work conforming to ACI 347.

1. Construct walls and seat walls less than 18” above finish grade without form ties unless essential for stability of formwork. Align form ties horizontally and vertically.
2. Install sufficient quantity of forms to allow continuous progress of work and so that forms can remain in place at least 24 hours after concrete placement.
3. Remove forms without damage to the placed concrete.
4. Do not use form ties for exposed portions of sand-blasted walls and structures where the holes will be visible after the form ties are removed. Use form braces only.
5. Install form ties and similar accessories such that all metal will be at least 1 inch from surface when forms are stripped.

B. Reinforcement: Install per the Drawings, and secure in place. Do not pour concrete prior to the inspection by the Owners Representative.

1. Use reinforcement (rebar) chairs to ensure that bar reinforcement / welded wire mesh has the required clearance off the bottom of the slab and installed parallel to the bottom of the slab and without dents. See Drawings for recommended spacing.
2. Install reinforcement / welded wire mesh with minimum cover as shown on the Drawings. A single cut through reinforcing materials in full depth vertical joints in paving as a means of separation is not acceptable.

C. Placement: Moisten aggregate base as required to provide a uniform, dampened condition at the time concrete is placed. Place concrete using methods which prevent segregation of the mix, with as little re-handling as possible. Consolidate concrete along the face of forms and adjacent to transverse assemblies, reinforcement, or side forms. Use care to prevent dislocation of reinforcing, dowels, and joint devices. Deposit and spread concrete in a continuous operation between transverse joints. If interrupted for more than 1/2 hour, place a construction/cold joint.

D. Control Joints: Construct control joints true-to-line with face perpendicular to surface of the concrete, unless otherwise shown. Construct transverse joints at right angles to the centerline, unless otherwise noted. See Control Joint Types specified herein for specific guidelines.

1. Set all joints accurately to grade and straight in alignment as shown on the Drawings. Alignment shall not vary more than 1/8" in 10' length.

E. Finishing: After striking-off and consolidating concrete, smooth the surface by screeding and floating. Use hand methods only where mechanical floating is not possible. Distribute concrete as required to remove surface irregularities, and re-float repaired areas to provide a continuous, smooth finish. Work edges of slabs, gutters, back top edge of curb, and formed joints with an

edging tool, and round to 1/2" radius, unless otherwise shown. Eliminate any tool marks on concrete surface.

1. After floating, test concrete surface for trueness - maximum 1/8" variation in 10’ length in any direction.
2. After completion of floating and when excess moisture or surface sheet has disappeared, complete surface finishing, as specified herein.
3. During finishing, do not apply cement to the dry concrete surface.
4. See Concrete Finishing elsewhere in this Specification

F. Curing: Protect and cure finished concrete, conforming to applicable requirements of Caltrans Standard Specifications.

1. Cure all concrete for at least 7 days after placing.

3.4 CONTROL JOINTS

A. General: Work under this Section to comply with ACI 302.

B. Expansion Joints: locate as shown on the Drawings.

1. Dowels: grease both ends.
2. Joint fillers: one-piece lengths for the full width being placed wherever possible. Where more than one length is required, lace or clip joint filler sections together. Form top edge of filler to conform to top profile of concrete.

C. Construction (Cold) Joints:

1. At old and new concrete pours. Drill the existing concrete to accept dowels and embed. Grease both ends of dowel, or epoxy end in existing concrete and grease end in new concrete.
2. At previous day’s pour and fresh pour: Grease both ends of dowel.
3. When curb and/or gutter and pedestrian paving are poured separately, provide #3 dowels, 8” length 24” O.C.

D. Weakened Plane Joints: locate as shown on the Drawings.

1. Curbs: construct tooled as shown on the Drawings.
2. Joint Width & Depth: Per Drawings. Do not exceed 3/16-inch in width.
3. Do not end completed joints short of vertical surfaces.

3.5 CONCRETE FINISHING

A. General: finishes as specified on the Drawings. Walking surfaces including curbs: slip-resistant and comply with accessibility provisions of CBC.

1. Prior to finishing, fill in form holes flush with concrete surface. Excludes Form Finish.
2. Remove all imperfections and blemishes that cannot be removed by specified finish type.

B. Finish types:

1. Broom finish - draw a stiff fine-hair broom across concrete surface, perpendicular to line of traffic. Repeat operation if required to provide a fine line texture. Texture must be true and straight across entire width of concrete slab.

3.6 REPAIR AND CLEAN-UP

A. Repair: repair or remove and replace defective work such as under-strength concrete, concrete out of line, level or plumb, or showing objectionable cracks, honeycomb, rock pockets, voids, spalling, exposed reinforcing, etc., directed by the Owners Representative and at no additional cost to the Owner. All cleaning, patching, and repairs shall be subject to approval and acceptance by the Owners Representative.

B. Protect new concrete from all construction activities for 72 hours; from construction material or equipment movement for 7 days; and from heavy vehicular movement for 28 days. Any activity on new concrete prior to 28 days is at the Contractor’s discretion and risk.

C. Clean up and remove from the site all spillage, overpour, discarded forming materials, rejected work or materials, and any other refuse or debris resulting from the work. Sweep concrete and wash free of stains, discolorations, dirt and other foreign materials just prior to final inspection.
   1. Clean step nosings of all cement or concrete.

D. Disposal: Segregate surplus material and debris remaining upon completion of the work as to type, and transport from the job site and dispose of in a legal manner.

END OF SECTION 321900

SECTION 33 11 16 - SITE WATER UTILITY DISTRIBUTION PIPING

PART 1 GENERAL

1.1 SUMMARY

A. Section includes pipe and fittings for site water line including domestic water line, fire water line, and valves and fire hydrants.

B. Related Sections:
1. Section 31 23 00 - Excavation and Fill.
2. Section 31 23 16.13 - Trenching.

1.2 REFERENCES

A. ASME B16.18 (American Society of Mechanical Engineers) - Cast Copper Alloy Solder Joint Pressure Fittings.

B. ASME B16.22 (American Society of Mechanical Engineers) - Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.

C. ASTM B88 - Seamless Copper Water Tube.

D. ASTM D1785 - Poly (VinylChloride) (PVC) Plastic Pipe, Schedules 40, 80 and 120.

E. ASTM D2241 - Poly (VinylChloride) (PVC) Plastic Pipe(SDR-PR).

F. ASTM D2466 - Poly (VinylChloride) (PVC) Plastic Pipe Fittings, Schedule 40.

G. ASTM D2855 - Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings.

H. ASTM D3139 - Joints for Plastic Pressure Pipes using Flexible Elastomeric Seals.

I. ASTM D3035 - Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Controlled Outside Diameter.

J. AWS A5.8 (American Welding Society) - Brazing Filler Metal.

K. AWWA C104 (American Water Works Association) - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.

L. AWWA C105(American Water Works Association) - Polyethylene Encasement for Ductile Iron Piping for Water and Other liquids.

M. AWWA C111 (American Water Works Association) - Rubber- Gasket Joints for Ductile Iron and Grey-Iron Pressure Pipe and Fittings.

N. AWWA C151 (American Water Works Association) - Ductile-Iron Pipe, Centrifugally

Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids.

O. AWWA C500 (American Water Works Association) - Gate Valves, 3 through 48 in NPS, for Water and Sewage Systems.

P. AWWA C502 (American Water Works Association) - Dry Barrel Fire Hydrants.

Q. AWWA C504 (American Water Works Association) - Rubber Seated Butterfly Valves.

R. AWWA C508 (American Water Works Association) - Swing-Check Valves for Waterworks Service, 2 in through 24 in NPS.

S. AWWA C509 (American Water Works Association) - Resilient Seated Gate Valves 3 in through 12 in NPS, for Water and Sewage Systems.

T. AWWA C600 (American Water Works Association) - Installation of Ductile-Iron Water Mains and Appurtenances.

U. AWWA C606 (American Water Works Association) - Grooved and Shouldered Type Joints.

V. AWWA C900 (American Water Works Association) - Standard for Polyvinyl Chloride (PVC) Pressure Pipe, 4 inch through 12 inch, for Water.

W. AWWA C901 (American Water Works Association) - Polyethylene (PE) Pressure Pipe, Tubing, and Fittings, 1/2 inch through 3 inch, for Water

X. UL 246 (Underwriters Laboratories, Inc.) - Hydrants for Fire - Protection Service.

1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures.

B. Product Data: Provide data on pipe materials, pipe fittings, valves and accessories.

C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.4 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements.

B. Project Record Documents: Record actual locations of piping mains, valves, connections, thrust restraints, and invert elevations.

C. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

D. Operation and Maintenance Data: Operation and Maintenance Data: Procedures for submittals.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with the local water supply utility and local fire department.

B. Valves: Manufacturer's name and pressure rating marked on valve body.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.

B. Deliver and store valves in shipping containers with labeling in place.

PART 2 PRODUCTS

2.1 WATER PIPE

A. Ductile Iron Pipe: AWWA C151:
1. Fittings: Ductile iron, standard thickness.
2. Joints: AWWA C111, rubber gasket with rods.

B. Copper Tubing: ASTM B88, Type K, annealed:
1. Fittings: ASME B16.18, cast copper, or ASME B16.22, wrought copper.
2. Joints: Compression connection or AWS A5.8, BCuP silver braze.

C. PVC Pipe: ASTM D1785, Schedule 40, ASTM D2241, SDR-26 for 160 psig pressure rating, SDR-41 for 100 psig rating, SDR-21 for 200 psig rating:
1. Fittings: ASTM D2466, PVC.
2. Joints: ASTM D2855, solvent weld.
3. Trace Wire: Magnetic detectable conductor, brightly colored plastic covering, imprinted with "Water Service" in large letters.

D. PVC Pipe: AWWA C900 Class 150:
1. Fittings: AWWA C111, cast iron.
2. Joints: ASTM D3139 compression gasket ring.
3. Trace Wire: Magnetic detectable conductor, brightly colored plastic covering, imprinted with "Water Service" in large letters.

E. Polyethylene Pipe: AWWA C901, ASTM D3035, for 160 psig pressure rating:
1. Fittings: AWWA C901, molded or fabricated.
2. Joints: Compression.
3. Trace Wire: Magnetic detectable conductor, brightly colored plastic covering, imprinted with "Water Service" in large letters.

2.2 GATE VALVES - UP TO 3 INCHES

A. Brass or Bronze body, non-rising stem, inside screw, single wedge or disc, IPS ends, with control rod, extension box, and valve key.

2.3 GATE VALVES - 3 INCHES AND OVER

A. AWWA C500, Iron body, bronze trim, non-rising stem with square nut, single wedge, flanged or mechanical joint ends, control rod, extension box, and valve key.

2.4 SWING CHECK VALVES - FROM 2 INCHES TO 24 INCHES

A. AWWA C508, iron body, bronze trim, 45 degree swing disc, renewable disc and seat, flanged ends.

2.5 BUTTERFLY VALVES - FROM 2 INCHES TO 24 INCHES

A. AWWA C504, iron body, bronze disc, resilient replaceable seat, water or lug ends, infinite position lever handle.

2.6 FLEXIBLE EXPANSION JOINTS:

A. Flexible ball joints shall be installed in the locations indicated on the drawings and shall be manufactured of ductile iron conforming to the material properties of ANSI/AWWA C153/A21.53. Flexible joints shall provide protection for shear, bending, and axial expansion. Each flexible ball joint shall be pressure tested against its own restraint to a minimum of 350 psi. MEGALUG joint restraint shall be provided with each mechanical joint connection. All pressure containing parts shall be lined with a minimum of 15 mils of fusion bonded epoxy, conforming to the applicable requirements of ANSI/AWWA C213 and shall be tested with a 1500 volt spark test conforming to stated specification. All flexible ball joints shall be FLEX-TEND DOUBLE BALL, as manufactured by EBAA Iron, Inc., or approved equal.

2.7 HYDRANT

A. Hydrant: Type as required by utility company and local fire department.

2.8 BEDDING AND COVER MATERIALS

A. Bedding: Shall be sand or gravel.

B. Cover: Shall be sand or gravel.

2.9 ACCESSORIES

A. Concrete for Thrust Restraints: Concrete type specified in Section 32 13 13.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Coordination.

B. Verify that building service connection and municipal utility water main size, location, and invert are as indicated.

3.2 PREPARATION

A. Cut pipe ends square, ream pipe and tube ends to full pipe diameter, remove burrs.

B. Remove scale and dirt on inside and outside before assembly.

C. Prepare pipe connections to equipment with flanges or unions.

3.3 BEDDING

A. Excavate pipe trench in accordance with Section 31 23 16.13 for Work of this Section.

B. Form and place concrete for pipe thrust restraints at any change of pipe direction. Place concrete to permit full access to pipe and pipe accessories. Provide square footage of thrust restraining bearing on subsoil, as required by AWWA Standards.

C. Place bedding material at trench bottom, level fill materials in one continuous layer not exceeding 6 inches compacted depth; compact to 95 percent relative compaction.

D. Backfill around sides and to top of pipe with cover fill, tamp in place and compact to 95 percent relative compaction.

E. Maintain optimum moisture content of fill material to attain required compaction density.

3.4 INSTALLATION - PIPE

A. Maintain separation of water main from sewer piping in accordance with the provisions of the Uniform Plumbing Code and local health codes.

B. Install pipe to indicated elevation to within tolerance of 2 inches.

C. Route pipe in straight line.

D. Install pipe to allow for expansion and contraction without stressing pipe or joints.

E. Install access fittings to permit disinfection of water system performed under Section 33 31 00.

F. Form and place concrete for thrust restraints at each elbow or change of direction of pipe main.

G. Establish elevations of buried piping to ensure not less than 2 feet of cover.

H. Install trace wire continuous over top of pipe. buried 6 inches above pipe line.

I. Backfill trench in accordance with Section 31 23 16.13.

3.5 INSTALLATION - VALVES AND HYDRANTS

A. Set valves on solid bearing.

B. Center and plumb valve box over valve. Set box cover flush with finished grade.

C. Set hydrants plumb; locate pumper nozzle perpendicular to and facing roadway.

D. Set hydrants to grade, with nozzles at least 20 inches above ground.

3.6 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

A. Flush and disinfect system in accordance with Section 33 31 00.

3.7 SERVICE CONNECTIONS

A. Provide water service to utility company requirements with reduced pressure backflow preventer and water meter with by-pass valves as required by local utility company.

3.8 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Testing and inspection services
Section 23 05 93 - Starting of Systems: Testing, adjusting, and balancing.

B. If tests indicate Work does not meet specified requirements, remove Work, replace, and retest.

END OF SECTION

SECTION 33 13 00 - DISINFECTION OF WATER DISTRIBUTION

PART 1 GENERAL

1.1 SUMMARY

A. Section includes disinfection of potable water distribution system, and testing and reporting results.

B. Related Sections:
1. Section 33 11 16 – Site Water Utility Distribution Piping.

1.2 REFERENCES

A. AWWA (American Waterworks Association) B300 - Standard for Hypochlorites.

B. AWWA (American Waterworks Association) B301 - Standard for Liquid Chlorine.

C. AWWA (American Waterworks Association) B302 - Standard for Ammonium Sulfate.

D. AWWA (American Waterworks Association) B303 - Standard for Sodium Chlorite.

E. AWWA (American Waterworks Association) C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances.

F. AWWA (American Waterworks Association) C651 - Standards for Disinfecting Water Mains.

1.3 SUBMITTALS

A. Section 01 34 00 - Submittal Procedures.

B. Test Reports: Indicate results comparative to specified requirements.

C. Procedures, Chemicals, and Treatment Levels: Submit procedures, proposed chemicals, and treatment levels for review.

D. Certificate: Certify that cleanliness of water distribution system meets or exceeds specified requirements.

1.4 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Closeout procedures.
B. Project Record Documents:
C. Disinfection Report:
1. Type and form of disinfectant used.

2. Date and time of disinfectant injection start and time of completion.
3. Test locations.
4. Name of person collecting samples.
5. Initial and 24-hour disinfectant residuals (quantity in treated water) in ppm for each outlet tested.
6. Date and time of flushing start and completion.
7. Disinfectant residual after flushing in ppm for each outlet tested.

D. Bacteriological Report:
1. Date issued, project name, and testing laboratory name, address, and telephone number.
2. Time and date of water sample collection.
3. Name of person collecting samples.
4. Test locations.
5. Initial and 24-hour disinfectant residuals in ppm for each outlet tested.
6. Coliform bacteria test results for each outlet tested.
7. Certification that water conforms, or fails to conform, to bacterial standards of local municipality.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with AWWA C651.

B. Maintain one copy of each document on site.

C. Water Treatment Firm: Company specializing in disinfecting potable water systems specified in this section with a minimum of three (3) years documented experience.

D. Testing Firm: Company specializing in testing and examining potable water systems, certified and approved by the State of California.

E. Submit bacteriologist's signature and authority associated with testing.

PART 2 PRODUCTS

2.1 DISINFECTION CHEMICALS

A. Chemicals: As directed by local municipality.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 06 00 - Administrative Requirements: Coordination.

B. Verify that the piping system has been cleaned, inspected, and pressure tested.

C. Perform scheduling and disinfecting activity with start-up, water pressure testing, adjusting and balancing, demonstration procedures, including coordination with related systems.

3.2 EXECUTION

A. Provide and attach required equipment to perform the Work of this section.

B. Introduce treatment into piping system.

C. Maintain disinfectant in system for 24 hours.

D. Flush, circulate, and clean until required cleanliness is achieved; use municipal or domestic water.

E. Replace permanent system devices removed for disinfection.

F. Pressure test system to 200 psi. Repair leaks and re-test.
1. After completion of the pipeline installation, including backfill, but prior to final connection to the existing system, conduct, in the presence of the Architect/Engineer, concurrent hydrostatic pressure and leakage tests in accordance with AWWA C600.
2. Provide all equipment required to perform the leakage and hydrostatic pressure tests.
3. The test pressure shall be not less than 200 psi or 50 psi in excess of maximum static pressure, whichever is greater.
4. The hydrostatic test shall be at least a two-hour duration.
5. No pipeline installation will be approved if the pressure varies by more than 5 psi during the duration of the hydrostatic pressure test.
6. Before applying the test pressure, air shall be expelled completely from the section of piping under test. Corporation cocks shall be installed so that the air can be expelled as the pipeline is being filled with water. After all the air has been expelled, the corporation cocks shall be closed and the test pressure applied. At the conclusion of the tests, the corporation cocks shall be removed and plugged.
7. Slowly bring the piping to the test pressure and allow the system to stabilize prior to conducting the leakage test. Valves shall not be operated in either the opening or closing direction at differential pressures above the rated pressure.
8. All exposed piping, fittings, valves, hydrants, and joints shall be examined carefully during the hydrostatic pressure test. Any damage or defective pipe, fittings, valves, hydrants, or joints that are discovered following the pressure test shall be repaired or replaced with sound material at no cost to the Owner, and test shall be repeated to the satisfaction of the Architect/Engineer.

9. No pipeline installation will be approved if the leakage is greater than that determined by the following formula:

$$L = \frac{SD\sqrt{P}}{133{,}200}$$

L = the allowable, in gallons per hour
S = the length of pipe tested, in inches
D = the nominal diameter of the pipe, in inches
p = the average test pressure during the leakage test, in pounds per square inch (gauge)

G. If leakage exceeds the rate as determined in Paragraph 9 above, locate the source and make repairs as necessary to the satisfaction of the Architect/Engineer.

3.3 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Control.

B. Disinfection, Flushing, and Sampling:
1. Disinfect the pipeline installation in accordance with AWWA C651, except that liquid chlorine shall not be used.
2. Upon completion of the retention period required for disinfection, flush the pipeline until the chlorine concentration of water leaving the pipeline is no higher than that generally prevailing in the existing system or is acceptable for domestic use.
3. Dispose of the chlorinated water in conformance with all Federal, State and Municipal laws, ordinances, rules, and regulations. If there is any possibility that the chlorinated discharge will cause damage to the environment, then a neutralizing chemical shall be applied to the chlorinated water to neutralize thoroughly the chlorine residual remaining in the water.
4. After final flushing and before the pipeline is connected to the existing system, or placed in service, the Contractor shall employ an approved independent testing laboratory to sample, test and certify the water for conformance with the purity standards of the local municipality, the United States Environmental Protection Agency, and the Federal Clean Water Act Health Standards. The Architect/Engineer shall be furnished with a copy of such certification by the testing laboratory, and no installation will be approved without such certification.

END OF SECTION

SECTION 33 30 00 - SANITARY SEWERAGE UTILITIES

PART 1 GENERAL

1.1 SUMMARY

A. Section includes sanitary sewerage drainage piping, fittings, accessories and bedding; connection of building sanitary drainage system to municipal sewers, or on-site point of connection.

B. Related Sections:
1. Section 31 23 00 - Excavation.
2. Section 31 23 16.13 - Trenching.
3. Section 31 23 23.13 - Backfill.

1.2 REFERENCES

A. ANSI/ASTM A74 - Cast Iron Soil Pipe and Fittings.

B. ANSI/ASTM C443 - Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets.

C. ANSI/ASTM D2321 - Recommended Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe.

D. ANSI/ASTM D2729 - Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.

E. ANSI/ASTM D2751 - Acrylonitrile-Butadiene-Styrene (ABS) Sewer Pipe and Fittings.

F. ANSI/ASTM D3033 - Type PSP Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.

G. ANSI/ASTM D3034 - Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.

H. ASTM A746 - Ductile Iron Gravity Sewer Pipe.

I. ASTM C564 - Rubber Gaskets for Cast Iron Soil Pipe and Fittings.

J. ASTM D1785 - Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80 and 120.

1.3 DEFINITIONS

A. Bedding: Fill placed under, beside and directly over pipe, prior to subsequent backfill operations.

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal procedures.

B. Product Data: Submit data indicating pipe, pipe accessories, and fittings.

C. Manufacturer's Installation Instructions: Indicate special procedures required to install Products specified.

D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.5 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements.

B. Project Record Documents: Record location of pipe runs, connections, cleanouts, and invert elevations.

C. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.6 FIELD MEASUREMENTS

A. Verify that field measurements and elevations are as indicated.

1.7 COORDINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Coordinate the Work with termination of sanitary sewer connection outside building, connection to municipal sewer utility services, or on-site connection point, and trenching.

PART 2 PRODUCTS

2.1 SEWER PIPE MATERIALS

A. Cast Iron Soil Pipe: ANSI/ASTM A74, Service type, inside nominal diameter of 4 to 8 inches, bell and spigot end.

B. Cast Iron Pipe Joint Device: ASTM C564, rubber gasket joint devices.

C. Ductile Iron Pipe: ASTM A746, Service type, inside nominal diameter of 4 to 8 inches, bell and spigot end.

D. Ductile Iron Pipe Joint Device: ANSI A21.11, rubber gasket joint devices.

E. Plastic Pipe: ANSI/ASTM D3034, Type PSM, Poly(Vinyl Chloride) (PVC) SDR-26 material; inside nominal diameter of 4 to 8 inches, bell and spigot style solvent sealed joint end.

F. Plastic Pipe: ASTM D1785, Schedule 40, Poly(Vinyl Chloride) (PVC) material; inside nominal diameter of 4 to 8 inches, bell and spigot style solvent sealed joint end.

2.2 PIPE ACCESSORIES

A. Fittings: Same material as pipe molded or formed to suit pipe size and end design, in required tee, bends, elbows, cleanouts, reducers, traps and other configurations required.

B. Flexible Expansion Joints: Flexible ball joints shall be installed in the locations indicated on the drawings and shall be manufactured of ductile iron conforming to the material properties of ANSI/AWWA C153/A21.53. Flexible joints shall provide protection for shear, bending, and axial expansion. Each flexible ball joint shall be pressure tested against its own restraint to a minimum of 350 psi. MEGALUG joint restraint shall be provided with each mechanical joint connection. All pressure containing parts shall be lined with a minimum of 15 mils of fusion bonded epoxy, conforming to the applicable requirements of ANSI/AWWA C213 and shall be tested with a 1500 volt spark test conforming to stated specification. All flexible ball joints shall be FLEX-TEND DOUBLE BALL, as manufactured by EBAA Iron, Inc., or approved equal.

2.3 CLEANOUTS

A. Lid and Frame: Cast iron construction:
1. Lid Design: Open checkerboard grill, labeled "Sewer."

B. Base Pad: Cast-In-Place concrete of type specified in Section 03 30 00, leveled top surface to receive concrete shaft sections, sleeved to receive sanitary sewer pipe sections.

2.4 BEDDING MATERIALS

A. Bedding: Fill Type as specified in Section 31 23 23.14.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Verify that trench cut is ready to receive work and excavations, dimensions, and elevations are as indicated on drawings.

3.2 PREPARATION

A. Correct over excavation with compacted bedding material.

B. Remove large stones or other hard matter which could damage pipe or impede consistent backfilling or compaction.

3.3 BEDDING

A. Excavate pipe trench in accordance with Section 31 23 16.13 for Work of this section. Hand trim excavation for accurate placement of pipe to elevations indicated.

B. Place bedding material at trench bottom, level materials in continuous layer not exceeding 6 inches, compacted depth, compact to 95 percent relative compaction.

C. Maintain optimum moisture content of bedding material to attain required compaction density.

3.4 INSTALLATION - PIPE

A. Install pipe, fittings, and accessories in accordance with ASTM D2321. Seal joints watertight.

B. Lay pipe to slope gradients noted on drawings; with maximum variation from true slope of 1/8 inch in 10 feet.

C. Install bedding at sides and over top of pipe to minimum compacted thickness of 12 inches; compacted to 95 percent relative compaction.

D. Refer to Section 31 23 16.13 for trenching requirements. Do not displace or damage pipe when compacting.

E. Refer to Section 33 49 13 for manhole requirements.

3.5 INSTALLATION - CLEANOUTS

A. Form bottom of excavation clean and smooth to correct elevation.

B. Form and place Cast-In-place Concrete base pad, with provision for sanitary sewer pipe end sections.

C. Establish elevations and pipe inverts for inlets and outlets as indicated.

D. Mount lid and frame level in grout, secured to top cone section to elevation indicated.

3.6 FIELD QUALITY CONTROL

A. Section 01 45 23 - Quality Requirements: Testing and inspection services

B. Request inspection prior to and immediately after placing bedding.

C. Compaction testing will be performed in accordance with ANSI/ASTM D1557.

D. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at no cost to Owner.

3.7 INSTALLATION, FLUSHING & CLEANING

A. All new pipe installed and existing pipe connected to shall be flushed, cleaned and videoed for at least 200 feet downstream, or to the next downstream cleanout or manhole, whichever is farther, of last point of connection to ensure clean and functioning system.

3.8 PROTECTION OF FINISHED INSTALLATION

A. Section 01 70 00 - Execution and Closeout Requirements: Protecting finished installation.

B. Protect pipe and aggregate cover from damage or displacement until backfilling operation is in progress.

END OF SECTION