PROJECT MANUAL

WILLIAM COLLIER ELEM SCHOOL SHADE STRUCTURE ADDITION & PLAYGROUND IMPROVEMENTS

WILLIAM COLLIER ELEMENTARY SCHOOL
20150 MAYHALL DR. WILDOMAR, CA. 92595
DSA Application No. 04-125584
Bid No. 01-26/27

Lake Elsinore Unified School District

1401 Education Way, Lake Elsinore, CA 92530
Purchasing Department Number: (951)253-7040
November 12, 2026

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NOTICE TO BIDDERS / INVITATION TO BID

1. Notice is hereby given that the governing board ("Board") of the **Lake Elsinore Unified School District** will receive sealed bids to construct the following project:

WILLIAM COLLIER ELEM SCHOOL SHADE STRUCTURE ADDITION & PLAYGROUND IMPROVEMENTS

2. To bid on this Project, the Bidder is required to have been prequalified by the District prior to submitting its bid. In addition, if the Project has electrical, mechanical, or plumbing components that will be performed by subcontractors performing under the following license classification(s), then each of those subcontractors that intend to bid as a first-tier subcontractor to a general contractor (prime contractor) are required to have been prequalified by the District: C-4, C-7, C-10, C-16, C-20, C-34, C-36, C-38, C-42, C-43, and/or C-46. All prequalification questionnaires will be received until 10 a.m., November 3, 2026. Prequalification documents are available from the Lake Elsinore Unified School District Website at https://www.qualitybidders.com/ .

3. Bidders must submit sealed bids on or before 10 a.m., November 12, 2026, at the **District Purchasing Services Office**, located at **1401 Education Way, Lake Elsinore, California 92530**, and Bidders must ensure that the District time stamps the Bidder's bid at or before that time. After the designated bid opening time, the District will open the bids and publicly read them aloud. Any claim by a Bidder of error in its bid must be made in compliance with Public Contract Code § 5100, et seq. The District is not responsible for (1) bids received after the deadline noted above; or (2) bids misdelivered, by any method, even to a different District address.

4. The Project consists of:

   Removal of existing lunch wood trellis and replacement with new PC approved metal shade structure. Addition of (1) new playground area with new play equipment and PC approved fabric shade structure. Addition of (1) walking track with new PC approved fabric shade structure. Remodel of (1) women's restroom in Building A.

5. All bids shall be on the forms provided by the District. Each bid must conform and be responsive to all pertinent bid and Contract Documents, including, but not limited to, the Instructions to Bidders.

6. To bid on this Project, the Bidder is required to possess one or more of the following State of California Contractor Licenses:

   A – General Engineering
   B – General Contracting

   If the Project has electrical, mechanical, or plumbing components that will be performed by subcontractors performing under the following license classification(s), then each of those subcontractors must also have an active license under the state of California: C-4, C-7, C-10, C-16, C-20, C-34, C-36, C-38, C-42, C-43, and/or C-46.

   The Bidder's license(s) must be active and in good standing at the time of the bid opening and must remain so throughout the term of the Contract.

7. As security for its Bid, each Bidder shall provide with its Bid form
   - a bid bond issued by an admitted surety insurer on the form provided by the District,
   - cash, or
   - a cashier's check or a certified check, drawn to the order of the **Lake Elsinore Unified School District**,

   in the amount of ten percent (10%) of the total bid price. This bid security shall be a guarantee that the Bidder shall, within five (5) calendar days after the date of the Notice of Award, enter into a contract with the District

for the performance of the services as stipulated in the bid.

8. The successful Bidder shall be required to furnish a 100% Performance Bond and a 100% Payment Bond if it is awarded the Contract for the Project.

9. The successful Bidder may substitute securities for any monies withheld by the District to ensure performance under the Contract, in accordance with the provisions of Public Contract Code § 22300.

10. The successful Bidder and its subcontractors shall pay all workers on the Project not less than the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work as determined by the Director of the Department of Industrial Relations, State of California, for the type of work performed and the locality in which the work is to be performed within the boundaries of the District, pursuant to Labor Code § 1770 et seq. Prevailing wage rates are on file with the District and are available to any interested party on request or at **www.dir.ca.gov/oprl/statistics_and_databases.html** . Bidders and Bidders' subcontractors shall comply with the registration and qualification requirements pursuant to Labor Code §§ 1725.5 & 1771.1.

11. A mandatory pre-bid conference and site visit will be held on **October 22, 2026, at 10 a.m**. at William Collier Elementary School, 20150 Mayhall Drive, Wildomar, California 92595. All prospective Bidders are required to sign in at the Administration Building. The Site Visit is expected to take approximately [**1.5**] hours. Failure to attend or tardiness will render bid ineligible.

12. Contract Documents are available on from the Lake Elsinore Unified School District Website.

13. The District's Board reserves the right to reject any and all bids and/or waive any irregularity in any bid received. If the District awards the Contract, the security of unsuccessful Bidder(s) shall be returned within sixty (60) days from the time the award is made. Unless otherwise required by law, no Bidder may withdraw its bid or bid security for ninety (90) days after the date of the bid opening.

14. The District shall award the Contract, if it awards it at all, to the lowest responsive responsible Bidder based on:

    The base bid amount only.

    Based on a process that conceals the identity of Bidders from the District until the bids have been ranked.

DISCLAIMER: LAKE ELSINORE UNIFIED SCHOOL DISTRICT reserves the right to award DONALD GRAHAM ELEM SCHOOL SHADE STRUCTURE ADDITION & PLAYGROUND IMPROVEMENTS project and WILLIAM COLLIER ELEM SCHOOL SHADE STRUCTURE ADDITION & PLAYGROUND IMPROVEMENTS project to a single contractor or multiple contractors contingent on the lowest bid. If the same bidder is selected for both projects, the bidder must ensure they have the ability to complete both projects within the same completion date specified in these contract documents.

END OF DOCUMENT

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INSTRUCTIONS TO BIDDERS

Bidders shall follow the instructions in this document, and shall submit all documents, forms, and information required for consideration of a Bid.

Lake Elsinore Unified School District will evaluate information submitted by all bidders and, if incomplete or does not fully comply with these Instructions to Bidders, Bidder's bid may be rejected at the sole discretion of District.

1. **Project.** Bids are requested for a general construction contract, or work described in general, for the following project:

   WILLIAM COLLIER ELEM SCHOOL SHADE STRUCTURE ADDITION & PLAYGROUND IMPROVEMENTS

2. **Prequalification Submission.** Bids will not be accepted if a Contractor has not been prequalified where prequalification is required. Prequalification documents are available from the Lake Elsinore Unified School District Website at https://www.qualitybidders.com/ . Prequalification documents must be submitted by June 10, 2024. Contractors will be notified by telephone, fax or by mail of their prequalification rating within a reasonable period of time after submission of their prequalification documents, but not less than five business days prior to the bid opening date.

3. **Submittal of Bids.** District will receive sealed Bids from Bidders as indicated in the Invitation to Bid and each Bidder shall ensure that its Bid contains all documents as required herein and is submitted by date and time shown in the Invitation to Bid.

   a. Bidders must ensure the District timely receives Bidder's bid, sealed and marked with name and address of the Bidder, the Project name and number, the bid number and bid package (if applicable), and the date for opening bids.

4. **Bid Opening.** Bids will be opened at or after the time indicated for receipt of bids.

5. **Complete Bids.** Bidders must supply all information required by each Bid Document. Bids must be full and complete. District reserves the right in its sole discretion to reject any Bid as non-responsive as a result of any error or omission in the Bid. Each Bidder must complete and submit all of the following documents as its Bid:

   - Acknowledgment of Bidding Practices Regarding Indemnity Form
   - Bid Form
   - Bid Bond or other security
   - Contractor's Certificate Regarding Workers Compensation
   - Contractor's Certificate Regarding Drug-Free Work Place
   - Contractor's Certificate Regarding Alcoholic Beverage and Tobacco-Free Campus Policy
   - Designated Subcontractors List
   - DVBE Participation Statement
   - Non-collusion Declaration
   - Iran Contracting Act Certification

   a. **Bid Form.** Bidders must submit Bids on the Bid Form and all other required District forms. Bids not submitted on the District's required forms shall be deemed non-responsive and shall not be considered. Additional sheets required to fully respond to requested information are permissible. Bidders shall not modify the Bid Form or qualify their Bids. Bidders shall not submit scanned, re-typed, word-processed, or otherwise recreated versions of the Bid Form or other District-provided documents.

   b. **Bid Bond or Other Security.** Bidders must submit their Bid Form with cash, a cashier's check or a certified

check payable to District, or a bid bond by an admitted surety insurer of not less than ten percent (10%) of their base Bid amount, including all additive alternates. Required form of corporate surety, Bid Bond, is provided by District and must be used and fully completed by Bidders choosing to provide a Bid Bond as security. The Surety on Bidders' Bid Bond must be an insurer admitted in the State of California and authorized to issue surety bonds in the State of California. Bids submitted without necessary bid security will be deemed non-responsive and will not be considered.

c. **Designated Subcontractors List.** Bidders must submit with the Bid the Designated Subcontractors List for those subcontractors who will perform any portion of Work, including labor, rendering of service, or specially fabricating and installing a portion of the Work or improvement according to detailed drawings contained in the plans and specifications, in excess of one half of one percent (0.5%) of the Bidder's total Bid. Failure to fully complete and submit this list when required by law shall result in Bid being deemed non-responsive and the Bid will not be considered.

d. **Non-collusion Declaration.** Bidders shall submit the Non-collusion Declaration with their Bids. Bids submitted without the Non-collusion Declaration shall be deemed non-responsive and will not be considered.

e. **Iran Contracting Act Certification.** Bidders shall submit the Iran Contracting Act Certification with their Bids. Bids submitted without the Iran Contracting Act Certification shall be deemed non-responsive and will not be considered.

6. **Erasures.** Bids shall be clearly written without erasure or deletions. Bidders cannot alter any provisions in the Contract Documents and no bid can include any erasure or deletion or revision to any provision.

7. **Prevailing Wages.** Pursuant to sections 1770 et seq. of the California Labor Code, Bidder and all Subcontractors under the Bidder shall pay all workers on all work performed pursuant to the Contract not less than the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work as determined by the Director of the State of California Department of Industrial Relations (DIR) for the type of work performed and the locality in which the work is to be performed within the boundaries of the District. Copies of the general prevailing rates of per diem wages for each craft, classification, or type of worker needed to execute the Contract, as determined by the DIR are on file with the District and are available to any interested party on request or at **www.dir.ca.gov/oprl/statistics_and_databases.html**.

8. **Contractor Registration.** Bidder shall ensure that it and its Subcontractors comply with the registration and compliance monitoring provisions of Labor Code section 1771.4, including furnishing its CPRs to the Labor Commissioner, and are registered pursuant to Labor Code section 1725.5. Bidder and its subcontractors shall comply with Labor Code section 1725.5 to be qualified to bid on, be listed in a bid proposal, subject to the requirements of Section 4104 of the Public Contract Code, or engage in the performance of the Contract.

9. **DVBE.** Section 17076.11 of the Education Code requires school districts using funds allocated pursuant to the State of California School Facility Program for the construction and/or modernization of school building(s) to have a participation goal for disabled veteran business enterprises ("DVBE") of at least three percent (3%) per year of the overall dollar amount expended on projects that receive state funding. For any project that is at least partially state-funded, the low Bidder must submit certification of compliance with the procedures for implementation of DVBE contracting goals with its signed Agreement. DVBE Certification Participation Forms are attached. Bidders should not submit these forms with their Bids.

10. **Bidder Diligence.** Submission of Bid signifies careful examination of the Contract Documents and a complete understanding of the nature, extent, and location of Work to be performed. Bidders must complete the tasks listed below as a condition to bidding, and submission of Bid shall constitute the Bidder's express representation to District that Bidder has fully completed the following:

    a. Bidder has visited the Project Site, if required, and has examined thoroughly and understood the nature

and extent of the Contract Documents, Work, Site, locality, actual conditions, as-built conditions, and all local conditions and federal, state and local laws, and regulations that in any manner may affect cost, progress, performance, or furnishing of Work or that relate to any aspect of the means, methods, techniques, sequences, or procedures of construction to be employed by Bidder and safety precautions and programs incident thereto;

b. Bidder has conducted or obtained and has understood all examinations, investigations, explorations, tests, reports, and studies that pertain to the subsurface conditions, as-built conditions, underground facilities, and all other physical conditions at or contiguous to the Site or otherwise that may affect the cost, progress, performance, or furnishing of Work, as Bidder considers necessary for the performance or furnishing of Work at the Contract Price, within the Contract Time, and in accordance with the other terms and conditions of Contract Documents, including specifically the provisions of the General Conditions. Bidder has notified the District if it contends that it requires additional examinations, investigations, explorations, tests, reports, studies, or similar information or data prior to submitting its bid;

c. Bidder has correlated its knowledge and the results of all observations, examinations, investigations, explorations, tests, reports, and studies with the terms and conditions of the Contract Documents;

d. Bidder has given the District prompt written notice of all conflicts, errors, ambiguities, or discrepancies that it has discovered in or among the Contract Documents and the actual conditions, and the written resolution thereof by the District is acceptable to Bidder;

e. Bidder has made a complete disclosure in writing to the District of all facts bearing upon any possible interest, direct or indirect, that Bidder believes any representative of the District or other officer or employee of the District presently has or will have in this Contract or in the performance thereof or in any portion of the profits thereof;

f. Bidder must, prior to bidding, perform the work, investigations, research, and analysis required by the Instructions to Bidders and that Bidder represented in its Bid Form and the Agreement that it performed prior to bidding. Bidder is charged with all information and knowledge that a reasonable bidder would ascertain from having performed this required work, investigation, research, and analysis. Bid prices must include entire cost of all work "incidental" to completion of the Work.

g. **Conditions Shown on the Contract Documents**: Information as to underground conditions, as-built conditions, or other conditions or obstructions, indicated in the Contract Documents, e.g., on Drawings or in Specifications, has been obtained with reasonable care, and has been recorded in good faith. However, District only warrants, and Bidder may only rely, on the accuracy of limited types of information.

(1) As to above-ground conditions or as-built conditions shown or indicated in the Contract Documents, there is no warranty, express or implied, or any representation express or implied, that this information is correctly shown or indicated. This information is verifiable by independent investigation and Bidder is required to make that verification as a condition to bidding. In submitting its Bid, Bidder shall rely on the results of its own independent investigation. In submitting its Bid, Bidder shall not rely on District-supplied information regarding above-ground conditions or as-built conditions.

(2) As to any subsurface condition shown or indicated in the Contract Documents, Bidder may rely only upon the general accuracy of actual reported depths, actual reported character of materials, actual reported soil types, actual reported water conditions, or actual obstructions shown or indicated. District is not responsible for the completeness of this information for bidding or construction; nor is District responsible in any way for any conclusions or opinions of Bidder drawn from that information; nor is District responsible for subsurface conditions that are not specifically shown if those subsurface conditions are reasonably determinable by above-ground

conditions and observation or as-built conditions (e.g., subsurface soil conditions in areas contiguous to areas where an above-ground condition is shown; utility pipes between a manhole and a water source, etc.).

h. **Conditions Shown in Reports and Drawings Supplied for Informational Purposes**: Reference is made to the document entitled Existing Information and Documentation Regarding Project Site, for identification of:

(1) Subsurface Conditions: Those reports of explorations and tests of subsurface conditions at or contiguous to the Project Site that have been utilized by Architect in preparing the Contract Documents; and

(2) Physical Conditions: Those drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Project Site that has been utilized by Architect in preparing the Contract Documents.

(3) These reports and drawings are **not** Contract Documents and, except for any "technical" data regarding subsurface conditions specifically identified in Existing Information and Documentation Regarding Project Site, and underground facilities data, Bidder may not in any manner rely on the information in these reports and drawings.

11. **Fire Safety Plan.** Bidder acknowledges and agrees that if awarded the Project, Bidder shall prepare and submit, as part of its "Safety Plan" a fire safety plan, pursuant to Section 3303.1 of Chapter 33 of the California Fire Code ("Fire Safety Plan"). The successful Bidder shall submit the Fire Safety Plan to the Division of The State Architect ("DSA") in conjunction with the filing of form *DSA 102-IC: Construction Start Notice/Inspection Card Request*, and must provide a copy to the District and the Architect. The successful Bidder's Fire Safety Plan submitted to DSA by Bidder shall include all of the components required under section 3303.1.1 of the CFC, which include the following:
    - Name and contact information of site safety director.
    - Documentation of the training of the site safety director and fire watch personnel.
    - Procedures for reporting emergencies.
    - Fire department vehicle access routes.
    - Locations of fire protection equipment, including portable fire extinguishers, sandpipes, fire department connections and fire hydrants.
    - Smoking and cooking policies, designated areas to be used where approved, and signage locations in accordance with CFC section 3305.8.
    - Location and safety considerations for temporary heating equipment.
    - A hot work (welding, roofing, etc.) plan.
    - Plans for control of combustible waste materials.
    - Locations and methods for storage and use of flammable and combustible liquids, and other hazardous materials.
    - Provisions for site security.
    - Changes that affect this plan.
    - Other site-specific information required by the local fire authority.

12. **As-Builts.** Bidders may examine any available "as-built" drawings of previous work by giving District reasonable advance notice. District will not be responsible for accuracy of "as-built" drawings. The document entitled Existing Information and Documentation Regarding Project Site applies to all supplied "as-built" drawings.

13. **Questions.** All questions about the meaning or intent of the Contract Documents are to be directed in writing to the District. Interpretations or clarifications considered necessary by the District in response to those questions will be issued in writing by Addenda faxed, mailed, or delivered to all parties recorded by the District as having received the Contract Documents. Questions received less than **SEVEN (7)** calendar days prior to the

date for opening Bids may not be answered. Only questions answered by formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

14. **Addenda.** Addenda may also be issued to modify parts of the Contract Documents as deemed advisable by the District. Bidder must acknowledge each Addendum in its Bid Form by number or its Bid may be considered non-responsive. Each Addenda shall be part of the Contract Documents. A complete listing of Addenda may be obtained from the District.

15. **Substitution for Specified Items**. Bids shall be based on products and systems specified in the Contract Documents or listed by name in Addenda. All requests must comply with the requirements specified in the General Conditions, the Specifications and the following:

    a. **Request for Substitution Prior to Bid**.

        (1) District must receive any request for substitution a minimum of **FOURTEEN (14)** calendar days prior to the date of bid opening.

        (2) **Information with Request.** Requests for substitutions shall contain sufficient information to assess acceptability of the product or system and impact to Project, including, without limitation, the requirements specified in the General Conditions and the Specifications. Insufficient information shall be grounds for rejection of substitution.

        (3) The District's denial of a substitution request prior to the date of bid opening shall be conclusive, requiring Bidders to list only approved items. The District is not responsible and/or liable in any way for a Bidder's damages and/or claims related, in any way, to that Bidder's basing its bid on any requested substitution that the District has not approved. Bidder's Bid shall be deemed non-responsive if it identifies a product or manufacturer of a non-approved substitution.

        (4) Approved substitutions shall be listed in Addenda.

        (5) District reserves the right not to act upon submittals of substitutions until after the date of bid opening. If the District does not act on a substitution request prior to the date of bid opening, Bidders must bid based on products and systems specified in Contract Documents or listed by name in Addenda.

    b. **Request for Substitution after Bid Award**. Substitutions may be requested after the Contract has been awarded only if indicated in and in accordance with requirements specified in the General Conditions, as may be modified in the Special Conditions.

16. **Alternates.** The Contract may include alternates. Alternates are defined as alternate products, materials, equipment, systems, methods, or major elements of the construction, that may, at the District's option and under terms established in the Contract and pursuant to section 20103.8 of the Public Contract Code, be selected for the Work. The District shall award the Contract, if it awards it at all, to the lowest responsive responsible bidder based on the criteria as indicated in the Invitation to Bid.

17. **Notice of Award.** The Bidder awarded the Contract shall execute and submit the following documents by 5:00 p.m. of the **FIFTH (5TH)** calendar day following the date of the Notice of Award. Failure to properly and timely submit these documents entitles District to, among other remedies, make a claim against Bidder's Bid Bond or deposit Bidder's cash, cashier's check, or certified check. The proceeds thereof may be retained by District as liquidated damages, in District's sole discretion.

    a. Agreement: To be executed by successful Bidder. Submit four (4) copies, each bearing an original signature.

b. Performance Bond (100%): On the form provided in the Contract Documents and fully executed as indicated on the form.

c. Payment Bond (100%) (Contractor's Labor and Material Bond): On the form provided in the Contract Documents and fully executed as indicated on the form.

d. Insurance Certificates and Endorsements as required.

e. Certifications to be Completed by Contractor

f. Disabled Veterans' Business Enterprise Participation Certification.

g. Criminal Background Investigation/Fingerprinting Certification.

h. If Contractor or any of its subcontractors intend to use on the Project any In-Use-Off-Road Deisel-Fueled Fleets, then Contractor must submit a Certificate of Reported Compliance for the each of the fleets and subcontractors listed in the Agreement.

18. **Notice to Proceed**. District may issue a Notice to Proceed within **THREE (3)** months from the date of the Notice of Award. Upon receipt of the Notice to Proceed, Contractor shall complete the Work within the period of time indicated in the Contract Documents. It is further expressly understood by Contractor that Contractor shall not be entitled to any claim of additional compensation or additional time when the Notice to Proceed is issued within the 3-month period.

    a. The District may postpone issuing the Notice to Proceed beyond the 3-month period, upon reasonable notice to Contractor.

    b. If the Contractor believes that a postponement of issuance of the Notice to Proceed will cause a hardship to Contractor, the Contractor may, by written notice to District within **SEVEN (7)** calendar days after receipt by Contractor of District's notice of postponement, take one of the following actions:

        (1) **Agree with the postponement**. This would be at no additional cost to the District.

        (2) **Terminate the Contract**. District shall only be obligated to pay Contractor for any Work that Contractor had performed at the time of notification of postponement and that the District had in writing authorized Contractor to perform, if any, prior to issuing a Notice to Proceed.

        (3) **Request additional compensation**. Contractor must submit detailed documentation demonstrating the need for that additional compensation, compared to the calculations and amounts that Contractor used to prepare its bid. If the Parties do not agree on an amount for the requested additional compensation, the Contractor can agree to the postponement without any additional compensation, or either Party may terminate the Contract.

    c. If the Contract is terminated as a result of a notice of postponement, District shall have the authority to award the Contract to the next lowest responsive responsible Bidder.

19. **Bid Protests.** Any bid protest by any Bidder regarding any other bid on this Project must be submitted in writing to the District, before 5:00 p.m. of the **THIRD (3rd)** Business Day following the date of bid opening.

    a. The protest must contain a complete statement of any and all bases for the protest.

    b. The protest must refer to the specific portions of all documents that form the bases for the protest, including the specific portion(s) of the bid(s) that the Bidder is protesting.

c. The protest must include the name, address and telephone number of the person representing the protesting party.

d. The party filing the protest must concurrently transmit a copy of the protest and any attached documentation to all other parties with a direct financial interest that may be adversely affected by the outcome of the protest, which must include all other Bidders or proposers who appear to have a reasonable prospect of receiving an award depending upon the outcome of the protest.

e. The procedure and time limits set forth in this paragraph are mandatory and are each Bidder's sole and exclusive remedy in the event of bid protest. Failure to comply with these procedures shall constitute a waiver of any right to further pursue the bid protest, including filing a Government Code Claim or legal proceedings.

20. **Rejection of Bids.** District reserves the right to reject any or all bids, including without limitation the right to reject any or all nonconforming, non-responsive, unbalanced, or conditional bids, to re-bid, and to reject the bid of any Bidder if District believes that it would not be in the best interest of the District to make an award to that Bidder, whether because the bid is not responsive or the Bidder is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by District. District also reserves the right to waive inconsequential deviations not involving price, time, or changes in the Work. For purposes of this paragraph, an "unbalanced bid" is one having nominal prices for work item(s) that represent substantive work and/or overly-enhanced prices for nominal work item(s).

21. **Bidder's Representative's Authority.** Each bid must be executed by an authorized representative of the Bidder. Bidders may be asked to provide documentation of that authority (e.g., an authenticated resolution of its Board of Directors, a power of attorney evidencing the capacity of the person signing the Bid Form to bind the Bidder to its bid, etc.).

22. **Bidder Responsibility.** Prior to the award of Contract, District reserves the right to consider the responsibility of the Bidder. District may conduct investigations as District deems necessary to assist in the evaluation of any bid and to establish the responsibility, including, without limitation, qualifications and financial ability of Bidders, proposed subcontractors, suppliers, and other persons and organizations to perform and furnish the Work in accordance with the Contract Documents to District's satisfaction within the Contract Time.

END OF DOCUMENT

CONTRACTOR'S CERTIFICATE REGARDING WORKERS' COMPENSATION FORM

Labor Code section 3700 in relevant part provides:

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

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

2. By securing from the Director of Industrial Relations a certificate of consent to self-insure, which may be given upon furnishing proof satisfactory to the Director of Industrial Relations of ability to self-insure and to pay any compensation that may become due to employees.

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

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

_____

(Signature)

_____

(Print)

_____

(Date)

In accordance with Article 5 (commencing at section 1860), Chapter 1, Part 7, Division 2 of the Labor Code, the above certificate must be signed and submitted with the Contractor's bid.

CONTRACTOR'S CERTIFICATE REGARDING DRUG-FREE WORKPLACE

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

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

4. 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.

5. Establishing a drug-free awareness program to inform employees about all of the following:

   a. The dangers of drug abuse in the workplace;
   b. The person's or organization's policy of maintaining a drug-free workplace;
   c. The availability of drug counseling, rehabilitation and employee-assistance programs; and
   d. The penalties that may be imposed upon employees for drug abuse violations;

6. Requiring that each employee engaged in the performance of the contract or grant be given a copy of the statement required by subdivision (a) and that, as a condition of employment on the contract or grant, the employee agrees to abide by the terms of the statement.

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

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

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

DATE:_____

_____
CONTRACTOR

By:_____
Signature

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

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

DATE:_____

_____
CONTRACTOR

By:_____
Signature

ACKNOWLEDGMENT OF BIDDING PRACTICES REGARDING INDEMNITY FORM

TO: Lake Elsinore Unified School District

RE: 01-26/27

Construction Contract for **WILLIAM COLLIER ES SHADE STRUCTURE ADDITION & PLAYGROUND IMPROVEMENTS**

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

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

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

_____

Contracting Party

_____

Name of Agent/Title

DOCUMENT 00 31 19

EXISTING INFORMATION AND DOCUMENTATION REGARDING PROJECT SITE

1. Summary

This document describes existing conditions at or near the Project and use of information available regarding existing conditions. This document is **not** part of the Contract Documents. See General Conditions for definition(s) of terms used herein. Contractor is required to request from the District a copy of any reports that it believes are necessary to perform Contractor's Work in a safe, efficient and workman-like manner.

2. Reports and Information on Existing Conditions

a. Documents providing a general description of the Site and conditions of the Work may have been collected by District, its consultants, contractors, and tenants. These documents may include previous contracts, contract specifications, tenant improvement contracts, as-built drawings, utility drawings, and information regarding underground facilities.

b. Information regarding existing conditions may be inspected at the District offices or the Construction Manager's offices, if any, and copies may be obtained at cost of reproduction and handling upon Bidder's agreement to pay for such copies. These reports, documents, and other information are **not** part of the Contract Documents.

c. Information regarding existing conditions may also be included in the Project Manual, but shall **not** be considered part of the Contract Documents.

d. The reports and other data or information regarding existing conditions and underground facilities at or contiguous to the Project are the following:

(1) **Geotechnical Data**. Geotechnical data at or near the Project that is in the District's possession available for Contractor's review.

(A) **Geotechnical Reports**. Geotechnical reports that may have been prepared for and around the Site by soil investigation engineers hired by the District and its consultants, contractors, and tenants. Geotechnical reports may be inspected at the District offices or the Construction Manager's offices, if any, and copies may be obtained at cost of reproduction and handling upon Bidder's agreement to pay for such copies. These reports are **not** part of the Contract Documents. The reports and drawings of physical conditions that may relate to the Project are the following:

(2) **Soils Investigation Report**
(3) **Mitigation Monitoring Plan from CEQA document**
(4) **Original Construction Drawings**
(5) **Survey of Site**
(6) **Hazardous Material Reports**
(7) **Asbestos and/or AHERA Reports**. Asbestos survey report, prepared for this Project and/or this Project site:

Title: _____
Date: _____
Author: _____
Availability: _____
_____

(8) [Other] Report
(9) [Other] Report

3. Use of Information

a. Information regarding existing conditions was obtained only for use of District and its consultants, contractors, and tenants for planning and design and is **not** part of the Contract Documents.

b. District does not warrant, and makes no representation regarding, the accuracy or thoroughness of any information regarding existing conditions. Bidder represents and agrees that in submitting a bid it is not relying on any information regarding existing conditions supplied by District.

c. Under no circumstances shall District be deemed to warrant or represent existing above-ground conditions, as-built conditions, or other actual conditions, verifiable by independent investigation. These conditions are verifiable by Contractor by the performance of its own independent investigation that Contractor must perform as a condition to bidding, and Contractor should not and shall not rely on this information or any other information supplied by District regarding existing conditions.

d. Any information shown or indicated in the reports and other data supplied herein with respect to existing underground facilities at or contiguous to the Project may be based upon information and data furnished to District by the District's employees and/or consultants or builders of such underground facilities or others. District does not assume responsibility for the completeness of this information, and Bidder is solely responsible for any interpretation or conclusion drawn from this information.

e. District shall be responsible only for the general accuracy of information regarding underground facilities, and only for those underground facilities that are owned by District, and only where Bidder has conducted the independent investigation required of it pursuant to the Instructions to Bidders, and discrepancies are not apparent.

4. Limited Reliance on Certain Information

a. Reference is made herein for identification of:

(1) Reports of explorations and tests of subsurface conditions at or contiguous to the Site that have been utilized by District in preparation of the Contract Documents.

(2) Drawings of physical conditions in or relating to existing subsurface structures (except underground facilities) that are at or contiguous to the Site and have been utilized by District in preparation of the Contract Documents.

b. Bidder may rely upon the general accuracy of the “technical data” contained in the reports and drawings identified above, but only insofar as it relates to subsurface conditions, provided Bidder has conducted the independent investigation required pursuant to Instructions to Bidders, and discrepancies are not apparent. The term “technical data” in the referenced reports and drawings shall be limited as follows:

(1) The term “technical data” shall include actual reported depths, reported quantities, reported soil types, reported soil conditions, and reported material, equipment or structures that were encountered during subsurface exploration. The term “technical data” does not include, and Bidder may not rely upon, any other data, interpretations, opinions or information shown or indicated in such drawings or reports that otherwise relate to subsurface conditions or described structures.

(2) The term “technical data” shall not include the location of underground facilities.

(3) Bidder may not rely on the completeness of reports and drawings for the purposes of bidding or construction. Bidder may rely upon the general accuracy of the "technical data" contained in such reports or drawings.

(4) Bidder is solely responsible for any interpretation or conclusion drawn from any "technical data" or any other data, interpretations, opinions, or information provided in the identified reports and drawings.

5. Investigations/Site Examinations

a. Before submitting a Bid, each Bidder is responsible for conducting or obtaining any additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and underground facilities) at or contiguous to the Site or otherwise, that may affect cost, progress, performance, or furnishing of Work or that relate to any aspect of the means, methods, techniques, sequences, or procedures of construction to be employed by Bidder and safety precautions and programs incident thereto or that Bidder deems necessary to determine its Bid for performing and furnishing the Work in accordance with the time, price, and other terms and conditions of Contract Documents.

b. On request, District will provide each Bidder access to the Site to conduct such examinations, investigations, explorations, tests, and studies, as each Bidder deems necessary for submission of a Bid. Bidders must fill all holes and clean up and restore the Site to its former condition upon completion of its explorations, investigations, tests, and studies. Such investigations and Site examinations may be performed during any and all Site visits indicated in the Invitation to Bid and only under the provisions of the Contract Documents, including, but not limited to, proof of insurance and obligation to indemnify against claims arising from such work, and District's prior approval.

END OF DOCUMENT

DOCUMENT 00 32 00

PREQUALIFICATION QUESTIONNAIRE FOR PROSPECTIVE BIDDERS

The **Lake Elsinore Unified School District** ("District") has determined that contractors on future projects ("Contractor(s)" or "Firm(s)") must be prequalified prior to submitting a bid or proposal on a project. This form must be completed by:

- A Contractor with an A, B, C-4, C-7, C-10, C-16, C-20, C-34, C-36, C-38, C-42, C-43, and/or C-46 license(s) that intends to bid as a **general contractor** (prime contractor) directly to the District. **Note that a prime contractor must identify all licenses for which it is seeking to be prequalified.**

- A Contractor with a C-4, C-7, C-10, C-16, C-20, C-34, C-36, C-38, C-42, C-43, and/or C-46 license(s) that intends to bid and perform under one of these license classifications as a **first-tier subcontractor** to a general contractor (prime contractor) that is bidding directly to the District.

Prequalification Submission. Bids will not be accepted if a Contractor has not been prequalified where prequalification is required. Prequalification documents are available from the Lake Elsinore Unified School District Website at https://www.qualitybidders.com/ . Prequalification documents must be submitted by June 10, 2024. Contractors will be notified by telephone, fax or by mail of their prequalification rating within a reasonable period of time after submission of their prequalification documents, but not less than five business days prior to the bid opening date.

Contractor List. The District will make available a list of prequalified general contractors and electrical, mechanical, and plumbing subcontractors to all prequalified Contractors at least five (5) Business Days prior to the date for submission of any response to a District bid or other solicitation covered by this prequalification.

References. The District reserves the right to contact any representative at Contractor's previous projects to gather information about the Contractor and/or to base the District's prequalification determination on a scoring of Contractor's references' responses to questions.

Updates. Contractors who are prequalified must update their prequalification questionnaire if or when Contractor's status or information changes from that previously disclosed to the District. The District reserves the right to adjust, suspend, or rescind the prequalification rating of any Contractor based on subsequently learned information.

Non-responsiveness. A Contractor's prequalification questionnaire shall be deemed nonresponsive if, without limitation, the Contractor's prequalification questionnaire is not returned on time, does not provide all requested information, is not signed under penalty of perjury by an individual who has the authority to bind the Contractor, is not updated as required or is misleading or inaccurate in any material manner (e.g., financial resources are overstated; previous terminations for cause, surety takeovers, liquidated damages paid, or violations of law are not accurately reported).

Rejection/Waiver/Request. The District reserves the right, in its sole discretion, to reject any or all prequalification questionnaires, to waive irregularities in any prequalification questionnaire or to request further information or documentation from any Contractor.

Public Records. Although the names of Contractors seeking prequalification may be public information, pursuant to, without limitation, Public Contract Code sections 20111.5(a) and 20111.6 (b), each Contractor's questionnaire and financial statements "shall not be public records and shall not be open to public inspection." However, the contents of Contractor's prequalification questionnaires and financial statements may be disclosed to third parties for purposes of clarification or investigation of material allegations or in any appeal process.

Appeal. A Contractor may appeal the District's decision. If a Contractor decides to appeal the District's prequalification decision, it must follow the following procedure:

1. Contractor shall submit, in writing, within **FIVE (5)** Business Days from District's determination, a detailed explanation of why it should be prequalified, with detailed and sufficient documentation supporting any and all bases for the appeal, and a request for a written response from the District to explain the District's determination.

2. Within five (5) Business Days from receipt of the District's written response to the Contractor's request, Contractor may submit, in writing, a request for a meeting with the District's staff. Contractor may submit with the request any and all additional information not previously provided that is directly responsive to the District's written response and that it believes supports a finding that District's determination should be changed.

3. The District will issue a final written determination of its decision on the appeal. The District staff may, at its discretion, hold a telephonic, virtual, or in person meeting with the Contractor prior to issuing its final written determination. The District's written determination shall be the final decision by the District, with no further right to an appeal.

4. **FAILURE OF A CONTRACTOR TO TIMELY FOLLOW ALL APPEAL STEPS SHALL BE A WAIVER OF ANY FURTHER REMEDY WITH CONCERNING PREQUALIFICATION WITH THE DISTRICT.**

DOCUMENT 00 41 13

BID FORM

To: Governing Board of **Lake Elsinore Unified School District**

From: _____
(Proper Name of Bidder)

1. **Total Bid.** The undersigned declares that the Contract Documents including, without limitation, the Invitation to Bid, the Instructions to Bidders, and the Special Conditions have been read, and agrees and proposes to furnish all necessary labor, materials, and equipment to perform and furnish all work in accordance with the terms and conditions of the Contract Documents, including, without limitation, the Drawings and Specifications for the following project:

   WILLIAM COLLIER ELEM SCHOOL SHADE STRUCTURE ADDITION & PLAYGROUND IMPROVEMENTS

   and will accept in full payment for that Work the following total lump sum amount, all taxes included:

Base Bid…	**$** _____ **Dollars**
Allowance Total…	**$ 180,000.00 Dollars**
TOTAL BASE BID **NOTE: IF THERE ARE ALLOWANCES IDENTIFIED IN THIS BID FORM, DO NOT INCLUDE ANY ALLOWANCE(S) AMOUNTS IN THESE BID AMOUNTS.**	**$** _____ **Dollars**

2. **Contract Review.** The undersigned has reviewed the Work outlined in the Contract Documents and fully understands the scope of Work required in this bid, understands the construction and project management function(s) is described in the Contract Documents, and that each Bidder who is awarded a contract shall be in fact a prime contractor, not a subcontractor, to the District, and agrees that its bid, if accepted by the District, will be the basis for the Bidder to enter into a contract with the District in accordance with the intent of the Contract Documents.

3. **Requests for Clarification.** The undersigned has notified the District in writing of any discrepancies or omissions or of any doubt, questions, or ambiguities about the meaning of any of the Contract Documents, and has contacted the Construction Manager before bid date to verify the issuance of any clarifying Addenda.

4. **Contract Time.** The undersigned agrees to commence work under this Contract on the date established in the Contract Documents and to complete all work within the time specified in the Contract Documents.

5. **Contractual Provisions.** The undersigned hereby acknowledges and agrees to be bound by following provisions and all provisions in the Contract Documents:

   - The liquidated damages clause of the General Conditions and Agreement.
   - The "Changes in the Work" provisions in the General Conditions that limit the permitted charges and mark-ups on change orders and on the amount of home office overhead that the successful bidder can receive from the District.

- The "Claims" provisions in the General Conditions that delineate the required process to submit and process disputes and claims.

6. **Bid Open for 90 Days.** It is understood that the District reserves the right to reject this bid and that the bid shall remain open to acceptance and is irrevocable for a period of ninety (90) days.

7. **Attachments.** The following documents are attached hereto:

   - The Bid Bond on the District's form or other security
   - The Designated Subcontractors List
   - The Non-collusion Declaration
   - Iran Contracting Act Certification

8. **Addenda Acknowledgement.** Receipt and acceptance of the following addenda is hereby acknowledged:

No.____, Dated _____	No.____, Dated _____
No.____, Dated _____	No.____, Dated _____
No.____, Dated _____	No.____, Dated _____
No.____, Dated _____	No.____, Dated _____
☐ Or check here if **no** addenda were issued.	

9. **Bidder's License.** Bidder acknowledges that the license required for performance of the Work is as stated in the Invitation to Bid. Bidder certifies that it is, at the time of bidding, and shall be throughout the period of the contract, licensed by the State of California to do the type of work required under the terms of the Contract Documents. Bidder further certifies that it is regularly engaged in the general class and type of work called for in the Contract Documents.

10. **Labor Harmony.** The undersigned hereby certifies that Bidder is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the Work.

11. **DIR Registration.** Bidder shall ensure that it and its Subcontractors comply with the registration and compliance monitoring provisions of Labor Code section 1771.4, including furnishing its CPRs to the Labor Commissioner, and are registered pursuant to Labor Code section 1725.5.

12. **Prequalification.** The Bidder confirms that it has been prequalified by the District. In addition, the Bidder confirms that, if the Project has electrical, mechanical, or plumbing components that will be performed by first-tier subcontractor with the following license classifications, then those subcontractors have also been prequalified by the District: C-4, C-7, C-10, C-16, C-20, C-34, C-36, C-38, C-42, C-43, and/or C-46.

13. **SWPPP QSP.** Bidder specifically acknowledges and understands that if it is awarded the Contract, it shall perform the Work of the Project related to being the District's Qualified SWPPP (Storm Water Pollution Prevention Plan) Practitioner ("QSP") and that the Bidder is certified to be the District's QSP, as required by the current California State Water Board's Construction General Permit.

14. **General Acknowledgement.** The Bidder represents that it is competent, knowledgeable, and has special skills with respect to the nature, extent, and inherent conditions of the Work to be performed. Bidder further acknowledges that there are certain peculiar and inherent conditions existent in the construction of the Work that may create, during the Work, unusual or peculiar unsafe conditions hazardous to persons and property.

Bidder expressly acknowledges that it is aware of such peculiar risks and that it has the skill and experience to foresee and to adopt protective measures to adequately and safely perform the Work with respect to such hazards.

15. **False Claims Act.** Bidder expressly acknowledges that it is aware that if a false claim is knowingly submitted (as the terms "claim" and "knowingly" are defined in the California False Claims Act, Cal. Gov. Code, §12650 et seq.), the District will be entitled to civil remedies set forth in the California False Claim Act. It may also be considered fraud and the Contractor may be subject to criminal prosecution.

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

Date: _____

Proper Name of Bidder: _____

Signature: _____

By: _____ (Print Name)

Title: _____

Address of Bidder: _____

Telephone Number: _____

Fax Number: _____

E-mail: _____

Webpage: _____

Bidder's Taxpayer Identification No.: _____

Bidder's DIR Registration No.: _____

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

No.: _____ Class: _____ Expiration Date: _____

No.: _____ Class: _____ Expiration Date: _____

Type of Organization of Bidder: _____

If Bidder is a corporation, provide the following:

Name of Corporation: _____

President: _____

Secretary: _____

Treasurer: _____

END OF DOCUMENT

DOCUMENT 00 43 13

BID BOND (SECURITY)
(Note: If Bidder is providing a bid bond as its bid security, Bidder must use this form, NOT a surety company form.)

The undersigned, _____ as Principal ("Principal");

and _____ as Surety ("Surety"; a corporation organized and existing under and by virtue of the laws of the State of _____ and authorized to do business as a surety in the State of California) are held and firmly bound unto the **Lake Elsinore Unified School District** as Obligee, in the sum of **$**_____ **Dollars,** lawful money of the United States, for the payment to the District will and truly to be made pursuant to the provisions herein. Principal and Surety each of us, bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally.

THE CONDITION OF THIS OBLIGATION IS SUCH that whereas the Principal has submitted a bid to the District for all Work specifically described in the accompanying bid and if the District awards the contract to the Principal and, within the time and manner required under the Contract Documents, after the prescribed forms are presented to Principal for signature, the Principal enters into a written contract, in the prescribed form in accordance with the bid, and files two bonds (one guaranteeing faithful performance and the other guaranteeing payment for labor and materials as required by law), and meets all other conditions to the contract between the Principal and the Obligee becoming effective, or if the Principal shall fully reimburse and save harmless the Obligee from any damage sustained by the Obligee through failure of the Principal to enter into the written contract and to file the required performance and labor and material bonds, and to meet all other conditions to the Contract between the Principal and the Obligee becoming effective, then this obligation shall be null and void; otherwise, it shall be and remain in full force and effect and the Surety shall immediately issue full payment of the sum stated above to the Obligee upon notification from the Obligee that the Principal has not taken all steps to nullify or void this obligation.

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

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

If the District awards the bid, the security of unsuccessful bidder(s) shall be returned within sixty (60) days from the time the award is made. Unless otherwise required by law, no bidder may withdraw its bid for ninety (90) days after the date of the bid opening.

IN WITNESS WHEREOF, this instrument has been duty executed by the Principal and Surety above named, on

Date: _____

Principal: _____

Signature: _____

By: _____ (Print Name)

Title: _____

Date: _____

Surety: _____

Signature: _____

By: _____ (Print Name)

Title: _____

The following information must be provided:

_____
Name of California Agent of Surety

_____
Address of California Agent of Surety

_____
Telephone Number of California Agent of Surety

_____
Email of California Agent of Surety

Bidder must attach Power of Attorney and Certificate of Authority for Surety and a Notarial Acknowledgment for all Surety's signatures. The California Department of Insurance must authorize the Surety to be an admitted Surety Insurer.

END OF DOCUMENT

DOCUMENT 00 43 36

DESIGNATED SUBCONTRACTORS LIST

TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

WILLIAM COLLIER ELEM SCHOOL SHADE STRUCTURE ADDITION & PLAYGROUND IMPROVEMENTS

1. **Listed.** Bidder must list hereinafter the name and location of each subcontractor who will be employed, and the scope of Work that each will perform if the Contract is awarded to the Bidder. Bidder acknowledges and agrees that under Public Contract Code section 4100, et seq., it must clearly identify the name and location of each subcontractor who will perform work or labor or render service to the Bidder in or about the construction of the Work in an amount in excess of one-half of one percent (1/2 of 1%) of Bidder's total Bid.

2. **CSLB Number.** Bidder must provide the Contactor State License Board number ("**CSLB No**.") for all listed subcontractors.

3. **DIR Number.** Bidder must provide the Department of Industrial Relations registration number ("**DIR No**.") for all listed subcontractors.

4. **Same Scope.** If more than one subcontractor is named for the same scope of Work, state with specificity the particular scope or portion that each subcontractor will perform.

5. **No Vendors or Suppliers.** Bidder need not list entities that are only vendors or suppliers of materials.

6. **Not Listed.** As to any Work that Bidder fails to list that is in excess of one-half of one percent (1/2 of 1%) of Bidder's total Bid, Bidder agrees that it is qualified to perform that scope of Work and will perform that scope of Work, or be subjected to penalty under applicable law.

7. **Alternate Work.** If alternate bids are called for and Bidder intends to use Subcontractors different from or in addition to those Subcontractors listed for work under the base Bid, Bidder must list Subcontractors that will perform Work in an amount in excess of one half of one percent (1/2 of 1%) of Bidder's total Bid, including alternates.

8. **Prequalification.** If the Project has electrical, mechanical, or plumbing components that will be performed by subcontractors performing under the following license classification(s), then each of those subcontractors must also have been prequalified by the District: C-4, C-7, C-10, C-16, C-20, C-34, C-36, C-38, C-42, C-43, and/or C-46.

9. **DVBEs.** Bidder must indicate which, if any, of its subcontractors are disabled veteran business enterprises (DVBE) and the estimated percentage of the Work those subcontractor(s) will perform.

10. **Bidders may correct inadvertent error(s) in listing subcontractors' CSLB Nos. or DIR Nos. within twenty-four (24) hours after bid opening.**

11. **Additional Sheets.** If further space is required for the list of proposed subcontractors, additional sheets showing the required information, as indicated below, shall be attached hereto and made a part of this document and submitted with this form.

I certify and declare under penalty of perjury under the laws of the State of California that all the information listed on the following page(s) is complete, true, and correct.

Date: _____

Proper Name of Bidder: _____

Signature: _____

By: _____ (Print Name)

Title: _____

Subcontractor Name	Portion of Work (Scope)	Location of Business	CSLB No.:
			DIR No.:
			If DVBE, % of Work:
Subcontractor Name	**Portion of Work (Scope)**	**Location of Business**	**CSLB No.:**
			DIR No.:
			If DVBE, % of Work:
Subcontractor Name	**Portion of Work (Scope)**	**Location of Business**	**CSLB No.:**
			DIR No.:
			If DVBE, % of Work:
Subcontractor Name	**Portion of Work (Scope)**	**Location of Business**	**CSLB No.:**
			DIR No.:
			If DVBE, % of Work:
Subcontractor Name	**Portion of Work (Scope)**	**Location of Business**	**CSLB No.:**
			DIR No.:
			If DVBE, % of Work:
Subcontractor Name	**Portion of Work (Scope)**	**Location of Business**	**CSLB No.:**
			DIR No.:
			If DVBE, % of Work:

Subcontractor Name	Portion of Work (Scope)	Location of Business	CSLB No.:
			DIR No.:
			If DVBE, % of Work:
Subcontractor Name	**Portion of Work (Scope)**	**Location of Business**	**CSLB No.:**
			DIR No.:
			If DVBE, % of Work:
Subcontractor Name	**Portion of Work (Scope)**	**Location of Business**	**CSLB No.:**
			DIR No.:
			If DVBE, % of Work:
Subcontractor Name	**Portion of Work (Scope)**	**Location of Business**	**CSLB No.:**
			DIR No.:
			If DVBE, % of Work:
Subcontractor Name	**Portion of Work (Scope)**	**Location of Business**	**CSLB No.:**
			DIR No.:
			If DVBE, % of Work:
Subcontractor Name	**Portion of Work (Scope)**	**Location of Business**	**CSLB No.:**
			DIR No.:
			If DVBE, % of Work:
Subcontractor Name	**Portion of Work (Scope)**	**Location of Business**	**CSLB No.:**
			DIR No.:
			If DVBE, % of Work:
Subcontractor Name	**Portion of Work (Scope)**	**Location of Business**	**CSLB No.:**
			DIR No.:
			If DVBE, % of Work:

END OF DOCUMENT

DOCUMENT 00 43 40

NONCOLLUSION DECLARATION
Public Contract Code § 7106

TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

The undersigned declares:

I am the _____ [**PRINT YOUR TITLE**]

of _____ [**PRINT FIRM NAME**],

the party making the foregoing bid.

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

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

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on the following date:

Date: _____

Proper Name of Bidder: _____

Signature: _____

By: _____ (Print Name)

Title: _____

END OF DOCUMENT

DOCUMENT 00 43 50

IRAN CONTRACTING ACT CERTIFICATION (Public Contract Code § 2204)

WILLIAM COLLIER ELEM SCHOOL SHADE STRUCTURE ADDITION & PLAYGROUND IMPROVEMENTS

Pursuant to Public Contract Code (PCC) section 2204, an Iran Contracting Act certification is required for solicitations of goods or services of one million dollars ($1,000,000) or more.

Bidder shall complete **ONLY ONE** of the following three paragraphs.

☐ 1. Bidder's Total Base Bid is less than one million dollars ($1,000,000).

OR

☐ 2. Bidder's Total Base Bid is one million dollars ($1,000,000) or more, but Bidder is **not** on the current list of persons engaged in investment activities in Iran created by the California Department of General Services ("DGS") pursuant to Public Contract Code § 2203(b), and Bidder is not a financial institution extending twenty million dollars ($20,000,000) or more in credit to another person, for 45 days or more, if that other person 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.

OR

☐ 3. Bidder's Total Base Bid is one million dollars ($1,000,000) or more, but the District has given prior written permission to Bidder to submit a proposal pursuant to PCC 2203(c) or (d). **A copy of the written permission from the District is included with Bid**.

I certify that I am duly authorized to legally bind the Bidder to this certification, that the contents of this certification are true, and that this certification is made under the laws of the State of California.

Date: _____

Proper Name of Bidder: _____

Signature: _____

By: _____ (Print Name)

Title: _____

END OF DOCUMENT

DOCUMENT 00 45 00

NOTICE OF AWARD

Dated: _____, 202____

To: _____ ("Contractor")

_____(Address)

From: Governing Board ("Board") of **Lake Elsinore Unified School District** ("District")

Re: **WILLIAM COLLIER ELEM SCHOOL SHADE STRUCTURE ADDITION & PLAYGROUND IMPROVEMENTS**

Contractor was awarded the Contract on **December 18, 2026**, by action of the District's Board.

The Contract Price is **$** _____ **Dollars**

and includes alternates _____

Three (3) copies of each of the Contract Documents (except Drawings) accompany the Notice of Award. Three (3) sets of the Drawings will be delivered separately or otherwise made available. Additional copies are available at cost of reproduction.

Contractor must comply with the following conditions precedent within **FIVE (5)** calendar days of the date of this Notice of Award.

Contractor shall execute and submit the following Contract Documents by 5:00 p.m. of the **FIFTH (5TH)** calendar day following the date of the Notice of Award. Failure to properly and timely submit the following Contract Documents entitles District to foreclose on Contractor's bid bond and award the contract to the next responsive, responsible bidder.

a. Agreement: Submit four (4) copies, each bearing an original signature. **If Contractor is a corporation, Contractor must attach a certified copy of the corporation's by-laws, or the resolution of the Board of Directors of the corporation, authorizing the signatory to execute the Agreement and the bonds required by the Contract Documents.**

b. Performance Bond (100%): Fully executed form provided in the Contract Documents.

c. Payment Bond (100%) (Contractor's Labor and Material Bond): Fully executed form provided in the Contract Documents.

d. Insurance Certificates and Endorsements as required.

e. Certifications to be Completed by Contractor

f. Disabled Veterans' Business Enterprise Participation Certification.

g. Criminal Background Investigation/Fingerprinting Certification.

h. If Contractor or any of its subcontractors intend to use on the Project any In-Use-Off-Road Deisel-Fueled Fleets, as that term is defined in Title 13, California Code of Regulations, section 2449(b)(1), then Contractor must submit a Certificate of Reported Compliance for the each of the

fleets and subcontractors listed in the Agreement

Failure to comply with these conditions within the time specified will entitle District to consider Contractor's bid abandoned, to annul the Notice of Award, and to declare Contractor's Bid Security forfeited, as well as any other rights the District may have against Contractor.

District will return to Contractor one fully signed counterpart of the Agreement.

Lake Elsinore Unified School District

Signature: _____

By: _____ (Print Name)

Title: _____

END OF DOCUMENT

DOCUMENT 00 45 10

AGREEMENT

This agreement is made and entered into on _____, 202_____, by and between the **Lake Elsinore Unified School District** ("District") and _____ ("**Contractor**") ("**Agreement**"). The District and the Contractor agree as follows:

1. **The Work:** Contractor shall furnish all tools, equipment, apparatus, facilities, labor, and material necessary to perform and complete in a good and workmanlike manner, the work of the following project:

   WILLIAM COLLIER ELEM SCHOOL SHADE STRUCTURE ADDITION & PLAYGROUND IMPROVEMENTS

   The Work shall be performed and completed as required in the Contract Documents as defined in the General Conditions including, without limitation, the Drawings and Specifications, under the direction and supervision of, and subject to, the approval of the District or its authorized representative.

2. **The Contract Documents**:

   a. The complete Contract consists of all Contract Documents as defined in the General Conditions and incorporated herein by this reference. All obligations of the District and Contractor are fully set forth and described in the Contract Documents. The Contract Documents are intended to cooperate so that Work called for in one and not mentioned in the other or vice versa is to be performed the same as if mentioned in all Contract Documents.

   b. **Interpretation of Contract Documents/Order of Precedence**: Questions concerning the intent, precedence, or meaning of the Contract Documents, including the Drawings or Specifications, shall be submitted to the District for interpretation. Inconsistencies in the Contract Documents shall be resolved by giving precedence in the following order:

      (i) District-approved modifications (e.g., Change Orders, Force Account Directives, etc.), beginning with the most recent (if any);
      (ii) Agreement;
      (iii) Special Conditions (if any);
      (iv) Supplemental Conditions (if any);
      (v) General Conditions;
      (vi) Remaining Division 0 documents (Documents beginning with "00");
      (vii) Division 1 Documents (Documents beginning with "01");
      (viii) Division 2 through Division 49 documents (Technical Specifications);
      (ix) Figured dimensions;
      (x) Large-scale drawings;
      (xi) Small-scale drawings.

      In case of conflict, the greater quantity and/or higher standard of workmanship shall apply unless the District expressly in writing (e.g., via a Change Order) accepts a lesser quantity or lower quality of workmanship and the Contract Price is adjusted accordingly. The decision of the District in the matter shall be final.

3. **Integration / Modification.** The Contract Documents and any documents specifically incorporated by reference are completely integrated as the complete and exclusive statement of the terms of the Agreement. This Agreement supersedes all previous contracts, agreements, and / or communications, both oral and written, and constitutes the entire understanding of the District and Contractor. No extrinsic evidence whatsoever shall be admissible or used to explain or supplement the terms of the Contract, Contract

Documents, or any items incorporated by reference. No changes, amendments or alterations shall be effective unless in writing, signed by both Parties, and unless provided otherwise by the Contract Documents.

4. **Classification of Contractor's License**: **If this project includes work that will be performed by mechanical electrical or pluming subcontractors (contractors that hold active C-4, C-7, C-10, C-16, C-20, C-34, C-36, C-38, C-42, C-43 or C-46 licenses under the state of California), such MEP subcontractors must also be prequalified**. A list of prequalified MEP subcontractors will be made available by the District to all bidders at least five business days prior to the bid opening date. It is the responsibility of the bidder to ensure that all MEP subcontractors holding any of the licenses listed above are properly prequalified before submitting a bid. This prequalification requirement applies even if the subcontractor will perform, or is designated to perform, work that does not require one of the licenses listed above, but the subcontractor holds one of the licenses listed above.

5. **Time for Completion**: It is hereby understood and agreed that the Contractor shall complete the Work within [**INDICATE NUMBER OF CALENDAR DAYS]** (60) consecutive calendar days ("**Contract Time**") from the date specified in the District's Notice to Proceed. The District shall not approve an early completion schedule by Contractor. A schedule showing the Work completed in less than the Contract Time indicated in the Contract, shall be considered to have Project Float.

6. **Completion-Extension of Time**: If Contractor fails to complete the Work within the Contract Time, due allowance being made for the contingencies provided for herein, Contractor shall become liable to District for all loss and damage that District may suffer on account thereof. Contractor shall coordinate its Work with the work of all other contractors. The District shall not be liable for delays resulting from Contractor's failure to coordinate its Work with other contractors in a manner that allows for timely completion of Contractor's Work. Contractor shall be liable for delays to other contractors caused by Contractor's failure to coordinate its Work with the work of other contractors.

7. **Liquidated Damages**: Time is of the essence for all Work to be performed. It is hereby understood and agreed that it is and will be difficult and/or impossible to ascertain and determine the actual damage that District will sustain in the event of and by reason of Contractor's delay; therefore, pursuant to Government Code section 53069.85 and Public Contract Code section 7203, Contractor shall forfeit and pay to District the following sum(s) as liquidated damages ("**Liquidated Damages**"):

    - **Project Completion: $1,000.00 ONE THOUSDAND dollars** per day as Liquidated Damages for each and every day's delay beyond the Contract Time to complete all the Work.

    a. Each portion of the Liquidated Damages shall be calculated cumulatively. For example, if Contractor is late in completing two milestones and the entire Project, Contractor will forfeit and pay three separate Liquidated Damages amounts. It is hereby understood and agreed that neither the total cumulative Liquidate Damages amount nor any portion of the Liquidated Damage amount are penalties.

    b. District may deduct Liquidated Damages from money due or that may become due Contractor under this Agreement. Contractor's forfeiture of Liquidated Damages to District, and District's right to retain Liquidated Damages, are as indicated in Government Code section 53069.85 and as indicated herein and in the General Conditions. Liquidated Damages are automatically and without notice of any kind forfeited and payable by Contractor upon the accrual of each day of delay. Neither District's failure or delay in deducting Liquidated Damages from payments otherwise due the Contractor, nor District's failure or delay in notifying Contractor of the forfeiture and payment of Liquidated Damages, shall be deemed a waiver of District's right to Liquidated Damages and/or the District's right to withhold Liquidated Damages from any amounts that would otherwise be payable to the Contractor.

    c. Contractor and Surety shall be liable for and pay to District the entire amount of Liquidated Damages including any portion that exceeds the amount of the Contract Price then held, retained or controlled by

District.

d. Liquidated Damages shall be in addition, and not in lieu of, District's right to charge Contractor for the District's cost of completing or correcting items of the Work.

8. Contract Price: In consideration of the foregoing covenants, promises, and agreements, Contractor offers, in the amounts stated below, to perform the Work according to the Contract Documents. District covenants, promises, and agrees that it will pay and cause to be paid to Contractor in full, and as the Contract Price the following amount(s):

$ _____ Dollars
Base Contract Amount

+ $ 180,00.00_____ Dollars
Allowance Amount

= **$ _____ Dollars**
("Contract Price")

a. **THE ABOVE ALLOWANCES ARE WITHIN THE CONTRACT PRICE ONLY TO THE EXTENT CONTRACTOR HAS PERFORMED WORK ENCOMPASSED BY THE ALLOWANCE DESCRIPTION, CONTRACTOR HAS APPROPRIATELY INVOICED FOR THAT WORK, AND DISTRICT HAS APPROVED CONTRACTOR'S INVOICE. CONTRACTOR SHALL INVOICE ONLY FOR COMPONENTS OF THE WORK ENCOMPASSED BY THE ALLOWANCE DESCRIPTION, IN THE IDENTICAL STRUCTURE AS A CHANGE ORDER. THE UNUSED PORTION OF EACH ALLOWANCE SHALL BE RETAINED BY THE DISTRICT.**

b. The Contract Price shall be paid in lawful money of the United States pursuant to the payment provisions in the General Conditions.

c. The District may, at its sole discretion, increase or decrease the Contract Price by unit prices or alternates contained in Contractor's original bid. If the Bid for the Work included proposal(s) for Alternate Bid Item(s), during Contractor's performance of the Work, the District may elect to add any such Alternate Bid Item(s) if the item did not form a basis for award of the Agreement or delete any such Alternate Bid Item(s) if that item formed a basis for award of the Agreement. If the District elects to add or delete an Alternate Bid Item(s) pursuant to the foregoing, the cost or credit for that Alternate Bid Item(s) shall be as set forth in the Contractor's Bid, at the District's discretion. If any Alternate Bid Item is added or deleted from the Work pursuant to the foregoing, the Contract Time shall be adjusted by the number of days allocated for the added or deleted Alternate Bid Item in the Contract Documents; if days are not allocated for any Alternate Bid Item added or deleted pursuant to the foregoing, the Contract Time shall be equitably adjusted.

9. Insurance and Bonds: Contractor shall provide all required certificates of insurance, and payment and performance bonds.

10. Performance of Work: If Contractor fails to perform the Work properly or fails to perform any provisions of this Contract, the District, may, pursuant to the General Conditions and without prejudice to any other remedy it may have, cure the deficiencies and deduct the cost thereof from the payment then or thereafter due Contractor.

11. Infectious Diseases or Viruses. Contractor is responsible for complying with all applicable and existing federal,

state, and/or local statutes, orders, rules, regulations, ordinances, and/or directives relating to construction site safety in connection with any pandemic, public health emergency, infectious disease or virus (e.g., COVID-19 or derivative strain, etc.). Contractor shall ensure it has supervisor employees onsite that are trained and knowledgeable of all of these requirements to ensure full compliance on Project Site(s).

12. **Authority of Architect, Project Inspector, and DSA**: Contractor hereby acknowledges that the Architect(s), the Project Inspector(s), and the Division of the State Architect have authority to approve and/or stop Work if Contractor's Work does not comply with the requirements of the Contract Documents, Title 24 of the California Code of Regulations, and all applicable laws. Contractor shall be liable for any delay caused by its non-compliant Work.

13. **Assignment of Contract**: Neither the Contract, nor any part thereof, nor any moneys due or to become due thereunder, may be assigned by Contractor without the written approval of District, nor without the written consent of the Surety on Contractor's Performance Bond (the "Surety"), unless the Surety has waived in writing its right to notice of assignment.

14. **Payment of Prevailing Wages**: Contractor and all Subcontractors under Contractor shall pay all workers on Work performed pursuant to this Contract not less than the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work as determined by the Director of the Department of Industrial Relations, State of California, for the type of work performed and the locality in which the work is to be performed within the boundaries of the District, pursuant to sections 1770 et seq. of the California Labor Code.

15. **Contractor & Subcontractor Registration**: Contractor shall comply with the registration and compliance monitoring provisions of Labor Code section 1771.4, including complying with any applicable enforcement by the Department of Industrial Relations.

16. **Authority of Contractor's Representatives**: Contractor hereby certifies that the person who executes this Agreement has the authority and power to legally bind the Contractor. Contractor also certifies that each person(s) it employees on the Project at or above the level of project superintendent, has the authority to legally bind the Contractor.

17. **Severability**: If any term, covenant, condition, or provision of the Contract Documents is held by a court of competent jurisdiction to be invalid, void or unenforceable, the remainder of the provisions in the Contract Documents shall remain in full force and effect and shall in no way be affected, impaired, or invalidated thereby.

18. **Notice**: Any notice required by the Agreement shall be in writing, dated and signed by the party giving notice or by a duly authorized representative of that party. Notice shall be served and considered effective if given in one of the following manners and to the following persons and addresses:

    a. By personal delivery; considered delivered on the day of delivery.

    b. By overnight delivery service; considered delivered one (1) day after date deposited, as indicated by the delivery service.

    c. By depositing same in United States mail, enclosed in a sealed envelope; considered delivered three (3) days after date deposited, as indicated by the postmarked date.

    d. By registered or certified mail with postage prepaid, return receipt requested; considered delivered on the day the notice is signed for.

If to District **Lake Elsinore Unified School District** 545 Chaney St. Lake Elsinore, CA 92530 ATTN: Bradd Runge	**If to Contractor:** @Contractor _____ _____, CA _____ ATTN: _____

19. Counterparts. This Agreement may be executed in any number of counterparts each of which shall be deemed to be an original and all of which together shall be deemed one and the same instrument

IN WITNESS WHEREOF, accepted and agreed on the date indicated above:

Dated: _____, 20_____	Dated: _____, 20_____
Lake Elsinore Unified School District	_____ **Contractor**
Signature: _____	Signature: _____
Print Name: _____	Print Name: _____
Print Title: _____	Print Title: _____

NOTE: If the Contractor is a corporation, Contractor must attach a certified copy of the corporation's by-laws, or of the resolution of the Board of Directors of the corporation, authorizing the above person to execute this Agreement and the bonds required by the Contract Documents.

END OF DOCUMENT

DOCUMENT 00 45 40

CERTIFICATIONS TO BE COMPLETED BY CONTRACTOR

THE UNDERSIGNED MUST CHECK EACH BOX AND EXECUTE THIS FORM AND HEREBY CERTIFIES TO THE GOVERNING BOARD OF THE DISTRICT THAT:

- The undersigned is a representative of the Contractor,
- The undersigned is familiar with the facts herein certified and acknowledged,
- The undersigned is authorized and qualified to execute this Agreement and these certifications on behalf of Contractor and that by executing this Agreement undersigned is certifying the following items.

☐ **Labor Code Sections 1860-1861 (Workers' Compensation).** In accordance with Labor Code section 3700, every contractor will be required to secure the payment of compensation to his or her employees. I acknowledge and certify under penalty of perjury that I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the work of this contract.

☐ **Labor Code Section 6401.9 (Workplace Violence Prevention).** I acknowledge and certify under penalty of perjury that I am aware of the provisions of Section 6401.9 of the Labor Code which require every employer, as specified in more detail in that section, to comply with the following:

- Establish, implement, and maintain, at all times in all work areas, an effective workplace violence prevention plan containing specified information;
- Record specified information in a violent incident log for every workplace violence incident;
- Provide initial and ongoing effective training of employees on workplace violence with training material appropriate in content and vocabulary to the education level, literacy, and language of employees;
- Create and maintain records of workplace violence hazard identification, evaluation, and correction for a minimum of five years; and
- Allow access to those records by employees and their representatives without cost.

I will comply with these provisions before commencing the performance of the Work of this Contract.

☐ **Government Code Sections 8355-8357 (Drug-Free Workplace).** I acknowledge and certify under penalty of perjury that I will provide a drug-free workplace by doing all of the following:

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

I also acknowledge that this Contract may be subject to suspension of payments under the contract or grant or termination of the contract or grant, or both, and the contractor or grantee thereunder may be subject to

debarment, in accordance with the requirements of the above-referenced statute, if the contracting or granting agency determines that any of the following has occurred:

(1) The contractor or grantee has made a false certification under Section 8355.
(2) The contractor or grantee violates the certification by failing to carry out the requirements of subdivisions (a) to (c), inclusive, of Section 8355.

I also acknowledge that the Department of General Services shall establish and maintain a list of individuals and organizations whose contracts or grants have been canceled due to failure to comply with the above-referenced statute. This list shall be updated monthly and published each month. No state agency shall award a contract or grant to a person or organization on the published list until that person or organization has complied with the above-referenced statute.

☐ **Tobacco-Free Environment**. Pursuant to, without limitation, 20 U.S.C. section 6083, Labor Code section 6400 et seq., Health & Safety Code section 104350 et seq. and District Board Policies, all District sites, including the Project site, are tobacco-free environments. Smoking and the use of tobacco products by all persons is prohibited on or in District property. District property includes school buildings, school grounds, school owned vehicles and vehicles owned by others while on District property.

I acknowledge and certify under penalty of perjury that I am aware of the District's policy regarding tobacco-free environments at District sites, including the Project site and acknowledge and certify that I will adhere to the requirements of that policy and not permit any of my firm's employees, agents, subcontractors, or my firm's subcontractors' employees or agents to use tobacco and/or smoke on the Project site. The District also prohibits electronic cigarettes, "vaping" or similar product uses on District sites.

☐ **No Hazardous Materials.** I acknowledge and certify under penalty of perjury that no Asbestos, or Asbestos-Containing Materials, polychlorinated biphenyl (PCB), or any material listed by the federal or state Environmental Protection Agency or federal or state health agencies as a hazardous material, or any other material defined as being hazardous under federal or state laws, rules, or regulations ("New Hazardous Material"), shall be furnished, installed, or incorporated in any way into the Project or in any tools, devices, clothing, or equipment used to affect any portion of Contractor's work on the Project for District. I have instructed our employees with respect to the above-mentioned standards, hazards, risks, and liabilities.

(i) Asbestos and/or asbestos-containing material shall be defined as all items containing but not limited to chrysotile, crocidolite, amosite, anthophyllite, tremolite, and actinolite. Any or all material containing greater than one-tenth of one percent (.1%) asbestos shall be defined as asbestos-containing material. Any disputes involving the question of whether or not material is New Hazardous Material shall be settled by electron microscopy or other appropriate and recognized testing procedure, at the District's determination. The costs of any such tests shall be paid by Contractor if the material is found to be New Hazardous Material.

(ii) All Work or materials found to be New Hazardous Material or Work or material installed with equipment containing "New Hazardous Material," will be immediately rejected and this Work will be removed at Contractor's expense at no additional cost to the District.

The Contractor must immediately notify the District within two (2) Business Days, if the Contractor finds and before it disturbs, any material that the Contractor believes may be hazardous waste, as defined in section 25117 of the Health and Safety Code, and requires removal to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law.

☐ **Lead as a Health Hazard**. Lead poisoning is recognized as a serious environmental health hazard facing children today. Even at low levels of exposure, much lower than previously believed, lead can impair the

development of a child's central nervous system, causing learning disabilities, and leading to serious behavioral problems. Lead enters the environment as tiny lead particles and lead dust disburses when paint chips, chalks, peels, wears away over time, or is otherwise disturbed. Ingestion of lead dust is the most common pathway of childhood poisoning; lead dust gets on a child's hands and toys and then into a child's mouth through common hand-to-mouth activity. Exposures may result from construction or remodeling activities that disturb lead paint, from ordinary wear and tear of windows and doors, or from friction on other surfaces.

Ordinary construction and renovation or repainting activities carried out without lead-safe work practices can disturb lead-based paint and create significant hazards. Improper removal practices, such as dry scraping, sanding, or water blasting painted surfaces, are likely to generate high volumes of lead dust.

Because the Contractor and its employees will be providing services for the District, and because the Contractor's work may disturb lead-containing building materials, **Contractor is hereby notified** of the potential presence of lead-containing materials located within certain buildings utilized by the District. All school buildings built prior to 1993 are presumed to contain some lead-based paint until sampling proves otherwise.

(i) **Overview of California Law**

Education Code section 32240 et seq. is known as the Lead Safe Schools Protection Act. Under this act, the Department of Health Services ("DHS") is to conduct a sample survey of schools in the State of California for the purpose of developing risk factors to predict lead contamination in public schools. (Ed. Code, § 32241.)

Any school that undertakes any action to abate existing risk factors for lead is required to utilize trained and state-certified contractors, inspectors, and workers. (Ed. Code, § 32243, subd. (b).) Moreover, lead-based paint, lead plumbing, and solders, or other potential sources of lead contamination, shall not be utilized in the construction of any new school facility or the modernization or renovation of any existing school facility. (Ed. Code, § 32244.)

Both the Federal Occupational Safety and Health Administration ("Fed/OSHA") and the California Division of Occupational Safety and Health ("Cal/OSHA") have implemented safety orders applicable to all construction work where a contractor's employee may be occupationally exposed to lead.

The OSHA Regulations apply to all construction work where a contractor's employee may be occupationally exposed to lead. The OSHA Regulations contain specific and detailed requirements imposed on contractors subject to that regulation. The OSHA Regulations define construction work as work for construction, alteration, and/or repair, including painting and decorating. It includes, but is not limited to, the following:

a. Demolition or salvage of structures where lead or materials containing lead are present;

b. Removal or encapsulation of materials containing lead;

c. New construction, alteration, repair, or renovation of structures, substrates, or portions thereof, that contain lead, or materials containing lead;

d. Installation of products containing lead;

e. Lead contamination/emergency cleanup;

f. Transportation, disposal, storage, or containment of lead or materials containing lead on the site or location at which construction activities are performed; and

g. Maintenance operations associated with the construction activities described in the subsection.

Because it is assumed by the District that all painted surfaces (interior as well as exterior) within the District contain some level of lead, it is imperative that the Contractor, its workers and subcontractors fully and adequately comply with all applicable laws, rules and regulations governing lead-based materials (including title 8, California Code of Regulations, section 1532. 1).

The Contractor must notify the District if any Work may result in the disturbance of lead-containing building materials. Any and all Work that may result in the disturbance of lead-containing building materials must be coordinated through the District. A signed copy of this Certification must be on file prior to beginning Work on the Project, along with all current insurance certificates.

(ii) **Renovation, Repair and Painting Rule, Section 402(c)(3) of the Toxic Substances Control Act**

In 2008, the U.S. Environmental Protection Agency, issued a rule pursuant to the authority of Section 402(c)(3) of the Toxic Substances Control Act, requiring lead safe work practices to reduce exposure to lead hazards created by renovation, repair and painting activities that disturb lead-based paint (Renovation, Repair and Painting Rule). Renovations in homes, childcare facilities, and schools built prior to 1978 must be conducted by certified renovations firms, using renovators with accredited training, and following the work practice requirements to reduce human exposures to lead.

Contractor, its workers and subcontractors must fully and adequately comply with all applicable laws, rules and regulations governing lead-based materials, including those rules and regulations appearing within title 40 of the Code of Federal Regulations as part 745 (40 CFR 745).

The requirements apply to all contractors who disturb lead-based paint in a six-square-foot area or greater indoors or a 20-square-foot area outdoors. If a DPH-certified inspector or risk assessor determines that a home constructed before 1978 is lead-free, the federal certification is not required for anyone working on that particular building.

(iii) **Contractor's Liability**

If the Contractor fails to comply with any applicable laws, rules, or regulations, and that failure results in a site or worker contamination, the Contractor will be held solely responsible for all costs involved in any required corrective actions, and shall defend, indemnify, and hold harmless the District, pursuant to the indemnification provisions of the Contract, for all damages and other claims arising therefrom.

If lead disturbance is anticipated in the Work, only persons with appropriate accreditation, registrations, licenses, and training shall conduct this Work.

It shall be the responsibility of the Contractor to properly dispose of any and all waste products, including, but not limited to, paint chips, any collected residue, or any other visual material that may occur from the prepping of any painted surface. It will be the responsibility of the Contractor to provide the proper disposal of any hazardous waste by a certified hazardous waste hauler. This company shall be registered with the Department of Transportation (DOT) and shall be able to issue a current manifest number upon transporting any hazardous material from any school site within the District.

The Contractor shall provide the District with any sample results prior to beginning Work, during the Work, and after the completion of the Work. The District may request to examine, prior to the commencement of the Work, the lead training records of each employee of the Contractor.

I acknowledge and certify under penalty of perjury, that:

1. I have received notification of potential lead-based materials on the District's property;
2. I am knowledgeable regarding and will comply with all applicable laws, rules, and regulations governing work with, and disposal of, lead.

☐ **Imported Materials.** All soils, aggregate, or related materials ("Fill") that Contractor, a Subcontractor, agent or supplier, in any way, provides or delivers and/or supplies to the Project Site shall be free of any and all hazardous material as defined in section 25260 of the Health and Safety Code, shall satisfy the requirements of any environmental review of the Project performed pursuant to the statutes and guidelines of the California Environmental Quality Act, sections 21000 et seq. of the Public Resources Code ("CEQA"), and shall comply with the requirements of sections 17210 et seq. of the Education Code, including requirements for a Phase I environmental assessment acceptable to the State of California Department of Education and Department of Toxic Substances Control. I acknowledge that, to the furthest extent permitted by California law, the indemnification provisions in the Contract Documents apply to, without limitation, any claim(s) connected with providing, delivering, and/or supplying Fill.

☐ **Roofing Contract Financial Interest Certification (Public Contract Code § 3006)**

I, _____ [**Your Name**], _____[**Firm Name**] certify that I have not offered, given, or agreed to give, received, accepted, or agreed to accept, any gift, contribution, or any financial incentive whatsoever to or from any person in connection with a roof project contract or subcontract on the Project. As used in this certification, "person" means any natural person, business, partnership, corporation, union, committee, club, or other organization, entity, or group of individuals.

I, _____ [**Your Name**], _____[**Firm Name**] certify that I do not have, and throughout the duration of the Contract, I will not have, any financial relationship in connection with the performance of the Contract with any architect, engineer, roofing consultant, materials manufacturer, distributor, or vendor that is not disclosed below.

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

Name of firm ("Firm"): _____
Mailing address: _____
Address of branch office used for this Project: _____
If subsidiary, name and address of parent company: _____

For Projects without substantive roofing components, check the following box and execute this certification:

☐ The Work on the Contract (1) does not include the replacement or repair of a roof or (2) is a repair of twenty five percent (25%) or less of the roof, (3) or is a repair project that has a total cost of twenty one thousand dollars ($21,000) or less.

☐ **Russian Sanctions Certification**

On February 21, 2022, President Biden issued Executive Order 14065 (https://www.whitehouse.gov/briefing-room/presidential-actions/2022/02/21/executive-order-on-blocking-property-of-certain-persons-and-prohibiting-certain-transactions-with-respect-to-continued-russian-efforts-to-undermine-the-sovereignty-and-territorial-integrity-of-ukraine/; "**Federal Order**") imposing economic sanctions and prohibiting many activities including, but not limited to, investing in, importing to, exporting from, and contracting with, areas of Ukraine and in Russia. On March 4, 2022, California Governor Newsom issued Executive Order N-6-22 requiring state agencies to take steps to ensure any agency and entity under contract with state agencies comply with the Federal Order

(https://www.gov.ca.gov/wp-content/uploads/2022/03/3.4.22-Russia-Ukraine-Executive-Order.pdf; "**State Order**").

The District requires the Contractor, as a vendor with the District, to comply with the economic sanctions imposed in response to Russia's actions in Ukraine, including the orders and sanctions identified on the U.S. Department of the Treasury website (https://home.treasury.gov/policy-issues/financial-sanctions/sanctions-programs-and-country-information/ukraine-russia-related-sanctions).

If your Firm's contract with the District has a cumulative value of $5 million or more, your certification here constitutes your written response to the District, indicating:

(1) that your Firm is in compliance with the required economic sanctions of the Federal and State Orders;

(2) the steps your Firm has taken in response to Russia's actions in Ukraine, including, but not limited to, desisting from making new investments in, or engaging in financial transactions with, Russian entities, not transferring technology to Russia or Russian entities, and directly providing support to the government and people of Ukraine.

☐ **Tuberculosis Certification**

The Contractor and its subcontractors shall at all times comply with the certification requirements as set forth below. Specifically, by checking the one applicable option below, Contractor hereby represents and warrants to District the following:

☐ Contractor and its subcontractors will not be present on a District school site and will not have contact with District students when District students are present during the term of this Contract.

☐ District has determined that Contractor will not have frequent or prolonged contact with students. District's determination is in compliance with and supported by California Education Code Section 49406(m).

☐ The following Contractor and its subcontractors shall or may be on a District school site and have contact with District students during the term of this Contract and, at no cost to District, they have received a tuberculosis risk assessment that complies with the requirements of California Education Code Section 49406. In addition, the Contractor shall maintain on file the certificates showing that the subcontractors were examined and found free from active tuberculosis. These forms shall be regularly maintained and updated by Contractor and shall be available to District upon request or audit.

Contractor further agrees and acknowledges that all new personnel hired after the effective date of this Contract are subject to the tuberculosis certification requirements and shall be prohibited from having any contact with District students until the tuberculosis certification requirements have been satisfied and District determines whether any such contact is permissible.

☐ **Lobbyist Certification**

The Contractor and its subcontractors shall at all times comply with the lobbyist certification requirements as set forth below. Specifically, by checking the one applicable option below, Contractor hereby represents and warrants

to District the following:

☐ Contractor and its subcontractors are not a "Lobbying Coalition," "Lobbying Firm," "Lobbyist" or "Lobbyist Employer" as those terms are defined in the Political Reform Act of 1974 (Gov. Code §§ 81000) (collectively "Lobbyist") and are not performing Services hereunder that would require registering as a Lobbyist.

☐ Contractor and its subcontractors Services hereunder shall or may include lobbying. Contractor and its subcontractors shall comply with all applicable District, local, state and/or federal policies, rules, regulations, statutes and requirements governing Lobbyists. In addition, the Contractor shall maintain on file registering and reporting records for Lobbyists. These records shall be regularly maintained and updated by Contractor and shall be available to District upon request or audit.

☐ **Conflict of Interest Certification**

The Contractor and its subcontractors shall at all times comply with the conflict of interest certification requirements as set forth below. Specifically, by checking the one applicable option below, Contractor hereby represents and warrants to District that the Contractor and its subcontractors have read and understand the District's Conflict of Interest Code and, Contractor knows or has reason to believe that Contractor has a conflict of interest that requires disclosure and Contractor and its subcontractors shall comply with the applicable disclosure requirements of the District's Conflict of Interest Code. In addition, the Contractor shall maintain on file statements of economic interests in accordance with applicable disclosure requirements. These records shall be regularly maintained and updated by Contractor and shall be available to District upon request or audit.

I ACKNOWLEDGE AND CERTIFY UNDER PENALTY OF PERJURY THAT I AM DULY AUTHORIZED TO LEGALLY BIND THE CONTRACTOR TO ALL PROVISIONS AND ITEMS INCLUDED IN THESE CERTIFICATIONS, THAT THE CONTENTS OF THESE CERTIFICATIONS ARE TRUE, AND THAT THESE CERTIFICATIONS ARE MADE UNDER THE LAWS OF THE STATE OF CALIFORNIA.

Date: _____

Proper Name of Contractor: _____

Signature: _____

By: _____ (Print Name)

Title: _____

END OF DOCUMENT

DOCUMENT 00 45 55

DISABLED VETERAN BUSINESS ENTERPRISE PARTICIPATION CERTIFICATION

Section 17076.11 of the Education Code requires school districts using funds allocated pursuant to the State of California School Facility Program ("Program") for the construction and/or modernization of school buildings to have a participation goal for disabled veteran business enterprises ("DVBE(s)") of at least three percent (3%), per year, of the overall dollar amount expended each year by the school district on projects that receive state funding.

Section 2001 of the Public Contract Code requires school districts to require each Bidder to provide in its bid certain information about its Subcontractors. In addition to completing this certification as indicated herein, each Bidder must provide the information related to DVBEs as required in the Designated Subcontractors List.

1. **Disabled Veteran Business Enterprise.** A DVBE is a business enterprise certified by the California Office of Small Business as a DVBE.

2. **DVBE Participation Policy.** The District is committed to achieving this DVBE participation goal. The District encourages Contractor to ensure maximum opportunities for the participation of DVBEs in the Work of the Contract.

3. **DVBE Participation Goal.** The three percent (3%) participation goal is not a quota, set-aside or rigid proportion.

4. **Certification of Participation.** At the time of execution of the Contract, the Contractor will provide a statement to the District of anticipated participation of DVBEs in the contract.

5. **Submission of Report.** During performance of the Contract, Contractor shall monitor the Work of the Contract, award of subcontracts and contracts for materials, equipment and supplies for the purpose of determining DVBE participation in the Work of the Contract.

    a) Contractor shall report on a monthly basis all DVBEs utilized in the performance of the Work, the type or classification of the Work performed by each DVBE, and the dollar value of the Work performed by each DVBE.

    b) Upon completion of the Work of the Contract, Contractor shall submit a report to the District in the form attached hereto identifying all DVBEs utilized in the performance of the Work, the type or classification of the Work performed by each DVBE, and the dollar value of the Work performed by each DVBE.

        i) The submission to the District of this report is a condition precedent to the District's obligation to make payment of the Final Payment under the Contract Documents. The submission of this report shall be in addition to, and not in lieu of, any other conditions precedent set forth in the Contract Documents for the District's obligation to make payment of the Final Payment.

        ii) The District reserves the right to request additional information or documentation from the Contractor evidencing efforts to comply with the three percent (3%) DVBE participation goal.

DVBE PARTICIPATION REPORT

Contractor Name: _____ Date: _____

Project Name: WILLIAM COLLIER ELEM SCHOOL SHADE STRUCTURE ADDITION & PLAYGROUND IMPROVEMENTS
Bid Number: 01-26/27

DVBE Firm Name	**Trade / Portion of Work**	**Subcontract/ Contract Value**
Add more sheets as needed to include all information for each DVBE		

Does the cumulative dollar value of these DVBE contracts meet or exceed the participation goal of three percent (3%) of the final Contract Price, as adjusted by all change orders?

YES _____ NO: _____

If your response is "NO," please attach to this report a detailed description of the reasons your firm did not achieve the participation goal of three percent (3%) of the final Contract Price.

I certify and declare under penalty of perjury under the laws of the State of California that all the foregoing information is complete, true, and correct.

Date: _____

Proper Name of Contractor: _____

Signature: _____

By: _____ (Print Name)

Title: _____

END OF DOCUMENT

DOCUMENT 00 45 85

CRIMINAL BACKGROUND INVESTIGATION / FINGERPRINTING CERTIFICATION

The undersigned does hereby certify to the governing board of the District that undersigned is a representative of the Contractor, is familiar with the facts herein certified, is authorized and qualified to execute this certificate on behalf of Contractor; and that the information in this Criminal Background Investigation / Fingerprinting Certification is true and correct.

1. **Education Code.** Contractor has taken at least one of the following actions (check all that apply):

☐ **All Workers Fingerprinted.** The Contractor has complied with the fingerprinting requirements of Education Code section 45125.1 with respect to all Contractor's employees and all of its subcontractors' employees who interact with pupils, outside of the immediate supervision and control of the pupil's parent or guardian or a school employee, has a valid criminal records summary as described in Education Code Section 44237 (Contractor shall "require each applicant for employment in a position requiring contact with minor pupils to submit two sets of fingerprints prepared for submittal by the employer to the Department of Justice for the purpose of obtaining criminal record summary information from the Department of Justice and the Federal Bureau of Investigation."). A complete and accurate list of Contractor's employees and of all of its subcontractors' employees who may interact with District pupils during the course and scope of the Contract is attached hereto; and/or

☐ **Physical Barrier.** Pursuant to Education Code section 45125.2, Contractor has installed or will install, prior to commencement of work, a physical barrier at the Project site, that will limit contact between Contractor's employees and District pupils at all times; and/or

☐ **Continual Supervision by Fingerprinted Employee.** Pursuant to Education Code section 45125.2, Contractor certifies that all employees will be under the continual supervision of, and monitored by, an employee of the Contractor who the California Department of Justice has ascertained has not been convicted of a violent or serious felony. The name and title of the employee who will be supervising Contractor's employees and its subcontractors' employees is:
Name: _____ Title: _____

☐ **Unoccupied Site**. The Work on the Contract is at an unoccupied school site and no employee and/or subcontractor or supplier of any tier of Contract shall come in contact with the District pupils.

2. **Megan's Law (Sex Offenders).** I have verified and will continue to verify that the employees of Contractor that will be on the Project site and the employees of the Subcontractor(s) that will be on the Project site are **not** listed on California's "Megan's Law" Website (http://www.meganslaw.ca.gov/).

Contractor's responsibility for background clearance extends to all of its employees, subcontractors, and employees of subcontractors coming into contact with District pupils regardless of whether they are designated as employees or acting as independent contractors of the Contractor.

Date: _____

Proper Name of Contractor: _____

Signature: _____

By: _____ (Print Name)

Title: _____

END OF DOCUMENT

DOCUMENT 00 54 55

ESCROW AGREEMENT FOR SECURITY DEPOSITS IN LIEU OF RETENTION
(Public Contact Code § 22300)

This Escrow Agreement ("Escrow Agreement") is made and entered into on _____, 20____, by and between the following:

Lake Elsinore Unified School District ("District"), whose address is 545 Chaney St. Lake Elsinore_____, California, and

_____ ("Contractor"), whose address is

_____, and

_____ ("Escrow Agent"), a state or federally chartered bank in California, whose address is

_____.

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

1. Pursuant to section 22300 of Public Contract Code of the State of California, which is hereby incorporated by reference, Contractor has the following two (2) options:

☐ Deposit securities with Escrow Agent as a substitute for retention earnings required to be withheld by District pursuant to the Construction Contract No. _____ entered into between District and Contractor for the _____ Project, in the amount of

_____ ($ _____) dated _____, 20___, (the "Contract");

OR

☐ On written request of Contractor, District shall make payments of the retention earnings for the Contract directly to Escrow Agent.

When Contractor deposits the securities as a substitute for Contract earnings, Escrow Agent shall notify District within ten (10) calendar days of the deposit. The market value of the securities at all times from substitution until the termination of the Escrow Agreement shall be at least equal to the cash amount then required to be withheld as retention pursuant to the Contract.

Securities shall be held in name of **Lake Elsinore Unified School District**, and shall designate Contractor as beneficial owner.

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

3. When District makes payment of retention earned directly to Escrow Agent, Escrow Agent shall hold them for the benefit of Contractor until the time that the escrow created under this Escrow Agreement is terminated. Contractor may direct the investment of the payments into securities. All terms and conditions of this Escrow Agreement and the rights and responsibilities of the Parties shall be equally applicable and binding when

District pays Escrow Agent directly.

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

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

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

7. District shall have the right to draw upon the securities and/or withdraw amounts from the Escrow Account in event of default by Contractor. Upon seven (7) days written notice to Escrow Agent from District of the default, if applicable, Escrow Agent shall immediately convert the securities to cash and shall distribute the cash as instructed by District.

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

9. Escrow Agent shall rely on written notifications from District and Contractor pursuant to Paragraphs 5 through 8, inclusive, of this Escrow Agreement and District and Contractor shall hold Escrow Agent harmless from Escrow Agent's release and disbursement of securities and interest as set forth above.

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

On behalf of District:

Name: _____

Title: _____

Address: _____

_____

On behalf of Contractor:

Name: _____

Title: _____

Address: _____

_____

On behalf of Escrow Agent:

Name: _____

Title: _____

Address: _____

_____

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

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

Dated: _____, 20_____

Lake Elsinore Unified School District

Signature: _____

Print Name: _____

Print Title: _____

Dated: _____, 20_____

_____ **Contractor**

Signature: _____

Print Name: _____

Print Title: _____

Dated: _____, 20_____

_____ **Escrow Agent**

Signature: _____

Print Name: _____

Print Title: _____

END OF DOCUMENT

DOCUMENT 00 54 70

STORM WATER POLLUTION PREVENTION PLAN

The Architect's Qualified SWPPP Developer ("QSD") shall prepare the SWPPP for the Contractor to install and comply with throughout the entire phase of construction. The SWPPP shall apply to all areas that are directly related to construction activity, including but not limited to staging areas, storage yards, material borrow areas and access roads.

The Contractor shall prepare and submit to the Local Governing Agencies and the District the SWPPP for review and approval.

ALSO, THERE ARE SWPPP REQUIREMENTS IN THE FOLLOWING DOCUMENTS:

- **DOCUMENT 00 71 00 (SPECIAL CONDITIONS)**
- **DIVISION ONE, INCLUDING DOCUMENT 01 57 10 (STORM WATER POLLUTION PREVENTION PLAN – CONSTRUCTION)]**

END OF DOCUMENT

DOCUMENT 00 61 14

PERFORMANCE BOND (100% of Contract Price)
(Note: Contractors must use this form, NOT a surety company form.)

WHEREAS, the governing board ("Board") of the **Lake Elsinore Unified School District**, ("District") and

_____, ("Principal)"

have entered into a contract for the furnishing of all materials and labor, services and transportation, necessary, convenient, and proper to perform the following project:

WILLIAM COLLIER ELEM SCHOOL SHADE STRUCTURE ADDITION & PLAYGROUND IMPROVEMENTS

which Contract dated _____, 20___, and all of the Contract Documents attached to or forming a part of the Contract, are hereby referred to and made a part hereof, and

WHEREAS, the Principal is required under the terms of the Contract to furnish a bond for the faithful performance of the Contract;

NOW, THEREFORE, the Principal and _____ ("Surety") are held and firmly bound unto the District in the penal sum of:

$ _____ DOLLARS,

lawful money of the United States, for payment to the District and will and truly be made pursuant to the provisions herein. The above penal sum shall increase with the Contract price if the District and the Principal increase the Contract price pursuant to the provisions in the Contract. Principal and Surety, each of us, bind ourselves, our heirs, executors, administrators, successors, and assigns jointly and severally to:

- Perform all the work required to complete the Project; and
- Pay to the District all damages the District incurs as a result of the Principal's failure to perform all the Work required to complete the Project.

In the event the Principal is declared by the District to be in breach or default in the performance of the Contract, then, after written notice from the District to the Surety, as provided for herein, the Surety shall either remedy the default or breach of the Principal or shall take charge of the Work of the Contract and complete the Contract with a Contractor other than the Principal at its own expense; provided, however, that the procedure by which the Surety undertakes to discharge its obligations under this Bond shall be subject to the advance written approval of the District.

The condition of the obligation is such that, if the above bound Principal, his or its heirs, executors, administrators, successors, or assigns, shall in all things stand to and abide by, and well and truly keep and perform the covenants, conditions, and agreements in the Contract and any alteration thereof made as therein provided, on his or its part to be kept and performed at the time and in the intent and meaning, including all contractual guarantees and warrantees of materials and workmanship, and shall indemnify and save harmless the District, its trustees, officers and agents, as therein stipulated, then this obligation shall become null and void, otherwise it shall be and remain in full force and effect.

As a condition precedent to the satisfactory completion of the Contract, the above obligation shall hold good for a period equal to the warranty and/or guarantee period of the Contract, during which time Surety's obligation shall continue if Contractor shall fail to make full, complete, and satisfactory repair, replace, and totally protect the District from loss or damage resulting from or caused by defective materials or faulty workmanship. The

obligations of Surety hereunder shall continue so long as any obligation of Contractor remains. Nothing herein shall limit the District's rights or the Contractor's or Surety's obligations under the Contract, law or equity, including, but not limited to, California Code of Civil Procedure section 337.15.

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

Any claims under this bond may be addressed to the Surety at the following address. This cannot be the Contractor's broker for this bond, but must be an employee of the Surety or the Surety's legal counsel:

_____

_____

Attention: _____

Telephone No.: _____

E-mail Address: _____

IN WITNESS WHEREOF, two (2) identical counterparts of this instrument, each of which shall for all purposes be deemed an original thereof, have been duly executed by the Principal and Surety above named, on

Date: _____ , 20_____.

Principal	**Surety**
_____	_____
(Name of Principal)	(Name of Surety)
_____	_____
(Signature of Person with Authority)	(Signature of Person with Authority)
_____	_____
(Print Name)	(Print Name)
	_____
	(Name of California Agent of Surety)
	_____
	(Address of California Agent of Surety)
	_____
	(Telephone Number of California Agent of Surety)

Contractor must attach a Notarial Acknowledgment for all Surety's signatures and a Power of Attorney and Certificate of Authority for Surety. The California Department of Insurance must authorize the Surety to be an admitted surety insurer.

END OF DOCUMENT

DOCUMENT 00 61 15

PAYMENT BOND -- Contractor's Labor & Material Bond (100% of Contract Price)
(Note: Contractors must use this form, NOT a surety company form.)

WHEREAS, the governing board ("Board") of the **Lake Elsinore Unified School District**, ("District") and

_____, ("Principal)"

have entered into a contract for the furnishing of all materials and labor, services and transportation, necessary, convenient, and proper to perform the following project:

WILLIAM COLLIER ELEM SCHOOL SHADE STRUCTURE ADDITION & PLAYGROUND IMPROVEMENTS

which Contract dated _____, 20___, and all of the Contract Documents attached to or forming a part of the Contract, are hereby referred to and made a part hereof, and

WHEREAS, pursuant to law and the Contract, the Principal is required, before entering upon the performance of the work, to file a good and sufficient bond with the body by which the Contract is awarded in an amount equal to 100 percent (100%) of the Contract price, to secure the claims to which reference is made in the Civil Code of California, including section 9100, and the Labor Code of California, including section 1741.

NOW, THEREFORE, the Principal and _____ ("Surety") are held and firmly bound unto all laborers, material men, and other persons referred to in said statutes in the penal sum of:

$ _____ DOLLARS,

lawful money of the United States, being a sum not less than the total amount payable by the terms of Contract, for the payment of which sum well and truly to be made pursuant to all applicable statutes and laws applicable to the provisions herein. The above penal sum shall increase with the Contract price if the District and the Principal increase the Contract price pursuant to the provisions in the Contract. Principal and Surety, each of us, bind ourselves, our heirs, executors, administrators, successors, or assigns, jointly and severally, to those applicable statutes and laws, and to the provisions herein.

The condition of this obligation is that if the Principal or any of his or its subcontractors, or the heirs, executors, administrators, successors, or assigns of any, all, or either of them shall fail to pay for any labor, materials, provisions, equipment, or other supplies, used in, upon, for or about the performance of the work contracted to be done, or for any work or labor thereon of any kind, or for amounts due under the Unemployment Insurance Act with respect to that work or labor, that the Surety will pay the same in an amount not exceeding the amount herein above set forth, and also in case suit is brought upon this bond, will pay a reasonable attorney's fee 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 under sections 9000 through 9566 of the Civil Code, 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 affect.

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

of time, alteration, or addition to the Contract Documents or to the Work.

IN WITNESS WHEREOF, two (2) identical counterparts of this instrument, each of which shall for all purposes be deemed an original thereof, have been duly executed by the Principal and Surety above named, on

Date: _____ , 20_____.

Principal	**Surety**
_____	_____
(Name of Principal)	(Name of Surety)
_____	_____
(Signature of Person with Authority)	(Signature of Person with Authority)
_____	_____
(Print Name)	(Print Name)
	_____
	(Name of California Agent of Surety)
	_____
	(Address of California Agent of Surety)
	_____
	(Telephone Number of California Agent of Surety)

Contractor must attach a Notarial Acknowledgment for all Surety's signatures and a Power of Attorney and Certificate of Authority for Surety. The California Department of Insurance must authorize the Surety to be an admitted surety insurer.

END OF DOCUMENT

DOCUMENT 00 63 00

DISTRICT CONTRACT FORMS

Lake Elsinore Unified School District will provide these forms as needed.

END OF DOCUMENT

DOCUMENT 00 65 10

NOTICE TO PROCEED

Dated: _____, 202____

To: _____ ("Contractor")

_____(Address)

From: Governing Board ("Board") of **Lake Elsinore Unified School District** ("District")

Re: **WILLIAM COLLIER ELEM SCHOOL SHADE STRUCTURE ADDITION & PLAYGROUND IMPROVEMENTS**

Contractor is hereby notified that the Contract Time under the Contract will commence to run on **December 21, 2026**. By that date, Contractor shall start performing its obligations under the Contract Documents. In accordance with the Agreement executed by Contractor, the Contract Time and Project Completion is **February 19, 2027**.

Contractor must submit the following documents by 5:00 p.m. of the **TENTH (10TH)** calendar day following the date of this Notice to Proceed:

1. Contractor's preliminary schedule of construction.
2. Contractor's preliminary schedule of submittals, including Shop Drawings, Product Data, and Samples submittals.
3. Contractor's preliminary schedule of values for all of the Work.
4. Contractor's preliminary Safety Plan specifically adapted for the Project.
5. A complete subcontractors list, including the name, address, telephone number, facsimile number, California State Contractor's License number, classification, and monetary value of all Subcontracts.

Thank you. We look forward to a successful Project.

Lake Elsinore Unified School District

Signature: _____

By: _____ (Print Name)

Title: _____

END OF DOCUMENT

DOCUMENT 00 65 36

WARRANTY AND GUARANTEE FORM

1. _____ ("Contractor")

hereby agrees that the _____ ("Work" of Contractor)

which Contractor has installed for the **Lake Elsinore Unified School District** ("District") for the following project:

WILLIAM COLLIER ELEM SCHOOL SHADE STRUCTURE ADDITION & PLAYGROUND IMPROVEMENTS

was performed in accordance with the requirements of the Contract Documents and that the Work as installed fulfills the requirements of the Contract Documents.

2. Contractor agrees to repair or replace all of the Work that may prove to be defective in workmanship or material and any other adjacent Work that may be displaced in connection with such replacement within a period of 1 **YEAR** from the date of Completion as defined in the Contract, ordinary wear and tear and unusual abuse or neglect excepted. The date of completion is _____, 20___.

3. In the event Contractor fails to comply with the above-mentioned conditions within a reasonable period of time, as determined by District, but not later than **SEVEN (7)** calendar days after being notified in writing by District, Contractor authorizes District to proceed to repair or replace the defective Work at the expense of Contractor. Contractor shall pay the costs and charges therefor upon demand.

4. Representatives to be contacted for service subject to the terms of Contract:

Name: _____

Address: _____

Telephone No.: _____

E-mail Address: _____

Date: _____

Proper Name of Contractor: _____

Signature: _____

By: _____ (Print Name)

Title: _____

END OF DOCUMENT

DOCUMENT 00 70 00

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1. CONTRACT TERMS AND DEFINITIONS

1.1. Definitions

Wherever used in the Contract Documents, the following terms shall have the meanings indicated, which shall be applicable to both the singular and plural thereof:

1.1.1. Adverse Weather: Weather that satisfies all of the following conditions: (1) unusually severe precipitation, sleet, snow, hail, heat, or cold conditions in excess of the norm for the location and time of year it occurred, (2) unanticipated, and (3) occurring at the Project Site.

1.1.2. Allowance(s): Amount(s) stated in the Agreement for specific scopes of work for which Contractor may, upon District's written approval, bill its time, materials, and other items in the identical structure as a Change Order.

1.1.3. Approval, Approved, and/or Accepted: Refer to written authorization, unless stated otherwise.

1.1.4. Architect: The individual, partnership, corporation, joint venture, or any combination thereof, named as Architect that has the rights and authority assigned to the Architect in the Contract Documents. The term Architect means the District's Architect on this Project or the Architect's authorized representative. If no Architect is used on the Project, then all references in the Contract Documents to Architect shall be read to refer to District.

1.1.5. As-Built Drawings: A reproducible full-size sets of drawings to be prepared on a monthly basis, and upon Project Completion, pursuant to the Contract Documents, that reflect changes made during the performance of the Work, recording differences between the original design of the Work and the Work as constructed.

1.1.6. Bidder: A contractor who provides a bid to the District to perform the Work of the Contract.

1.1.7. Change Order: A written order to the Contractor authorizing an addition to, deletion from, or revision in the Work, and/or authorizing an adjustment in the Contract Price or Contract Time. If a Change Order is required to be approved by DSA, the District may call it a Construction Change Document.

1.1.8. Completion: When the entire Work shall have been completed, including all punch list items, as further detailed in the "Completion of the Project" Section herein. Final DSA approval of the Project is not required for Completion. There is no "Substantial Completion" or "Beneficial Occupancy" for this Project, although the District may occupy the Project prior to completion as permitted herein.

1.1.9. Construction Manager: The individual, partnership, corporation, joint venture, or any combination thereof, or its authorized representative, named as such by the District. If no Construction Manager is used on the Project, then all references in the Contract Documents to Construction Manager shall be read to refer to District.

1.1.10. Construction Schedule: The progress schedule of construction of the Project as provided by Contractor and approved by District.

1.1.11. Contract, Contract Documents: The Contract consists exclusively of the documents evidencing the agreement of the District and Contractor, identified as the Contract Documents. The Contract Documents consist of the following documents:

1.1.11.1. Notice to Bidders / Invitation to Bid

1.1.11.2. Instructions to Bidders

1.1.11.3. Bid Form

1.1.11.4. Bid Bond

1.1.11.5. Designated Subcontractors List

1.1.11.6. Noncollusion Declaration

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1.1.11.12. Agreement

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1.1.11.15. Storm Water Pollution Prevention Plan (if applicable)

1.1.11.16. Notice to Proceed

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1.1.11.18. Payment Bond (Contractor's Labor and Material Bond)

1.1.11.19. District Contract Forms (if applicable)

1.1.11.20. District Closeout Forms (if applicable)

1.1.11.21. Warranty and Guarantee Form

1.1.11.22. General Conditions

1.1.11.23. Special Conditions

1.1.11.24. Project Plans, Specifications, Technical Specifications, and Drawings

1.1.11.25. Addenda to any of the above documents

1.1.11.26. Schedules if approved in writing by the District

1.1.11.27. Change Orders or written modifications to the above documents if approved in writing by the District

1.1.12. Contract Price: The total monies payable to the Contractor under the terms and conditions of the Contract Documents.

1.1.13. Contract Time: The time period stated in the Agreement for the Completion of the Work.

1.1.14. Contractor: The licensed person, entity, or entities identified in the Agreement as contracting to perform the Work.

1.1.15. Daily Job Report(s): Daily Project reports prepared by the Contractor's employee(s) who are present on Site, which shall include the information required herein.

1.1.16. Day(s): Unless otherwise designated, day(s) means calendar day(s). "**Business Day(s)**" shall mean days except Saturday, Sunday, a day that is federally-recognized holiday, or a day that is a California-recognized holiday.

1.1.17. Defective or Nonconforming Work. Defective or nonconforming Work is any Work which is unsatisfactory, faulty or deficient by: (a) not conforming to the requirements of the Contract Documents; (b) not conforming to the standards of workmanship of the applicable trade; (c) not being in compliance with the requirements of any inspection, reference, standard, test, or approval required by the Contract Documents; or (d) damage to Work occurring prior to Completion.

1.1.18. District: The public agency or the school district for which the Work is performed.

1.1.19. Drawings: (or "Plans") The graphic and pictorial portions of the Contract Documents showing the design, location, scope and dimensions of the Work, generally including plans, elevations, sections, details, schedules, sequence of operation, and diagrams.

1.1.20. DSA: Division of the State Architect.

1.1.21. Force Account Directive: A process that may be used when the District and the Contractor cannot agree on a price for a specific scope of work or before Contractor prepares a price for the scope of work and Contractor is directed in writing by the District to perform on a time and materials basis.

1.1.22. Premises: The real property owned by the District on which the Project Site is located. For example, if the Project is only being performed on a portion of a school, the Site is only the area where the Project is located (the Project Site), and the Premises is the entire school site.

1.1.23. Product(s): New material, machinery, components, equipment, fixtures and systems forming the Work, including existing materials or components required and approved by the District for reuse.

1.1.24. Product Data: Illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by Contractor to illustrate a material, product, or system for a scope of the Work.

1.1.25. Project: The planned undertaking as provided for in the Contract Documents.

1.1.26. Project Inspector: (or "Inspector") Individual(s) retained by the District in accordance with Title 24 of the California Code of Regulations to monitor and inspect the Project. If no Project Inspector is used on the Project, then all references in the Contract Documents to Project Inspector shall be read to refer to District.

1.1.27. Program Manager: The individual, partnership, corporation, joint venture, or any combination thereof, or its authorized representative, named as such by the District. If no Program Manager is designated for the Project then all references to Program Manager shall refer to District.

1.1.28. Proposed Change Order: A written request prepared by the Contractor requesting that the District and the Architect issue a Change Order based upon a proposed change to the Work.

1.1.29. Provide: Shall include "provide complete in place," that is, "furnish and install," and "provide complete and functioning as intended in place" unless specifically stated otherwise.

1.1.30. Request for Information: (or "RFI") A written request prepared by the Contractor requesting that the Architect provide additional information necessary to clarify or amplify an item in the Contract Documents that the Contractor believes is not clearly shown or called for in the Drawings or Specifications or other portions of the Contract Documents, or to address issues that have arisen under field conditions.

1.1.31. Request for Substitution: A request by Contractor to substitute an equal or superior material, product, thing, or service for a specific material, product, thing, or service that has been designated in the Contract Documents by a specific brand or trade name.

1.1.32. Safety Orders: Written and/or verbal orders for construction issued by the California Division of Industrial Safety ("CalOSHA") or by the United States Occupational Safety and Health Administration ("OSHA").

1.1.33. Safety Plan: Contractor's safety plan specifically adapted for the Project. Contractor's Safety Plan shall comply with all provisions regarding Project safety, including all applicable provisions in these General Conditions, the Instructions to Bidders, and shall include a Fire Safety Plan, pursuant to Section 3303.1 of Chapter 33 of the California Fire Code.

1.1.34. Samples: Physical examples that illustrate materials, products, equipment, finishes, colors, or workmanship and that, when approved in accordance with the Contract Documents, establish standards by which portions of the Work will be judged.

1.1.35. Shop Drawings: All drawings, prints, diagrams, illustrations, brochures, schedules, and other data that are prepared by the Contractor, a subcontractor, manufacturer, supplier, or distributor, that illustrate how specific portions of the Work shall be fabricated or installed.

1.1.36. Site: The Project site as shown on the Drawings.

1.1.37. Specifications: That portion of the Contract Documents, Division 1 through Division 17, and all technical sections, and addenda to all of these, if any, consisting of written descriptions and requirements of a technical nature of materials, equipment, construction methods and systems, standards, and workmanship.

1.1.38. Subcontractor: A contractor and/or supplier who is under contract with the Contractor or with any other subcontractor, regardless of tier, to perform a portion of the Work.

1.1.39. Submittal Schedule: The schedule of submittals as provided by Contractor and approved by District.

1.1.40. Surety: The person, firm, or corporation that executes as surety the Contractor's Performance Bond and Payment Bond, and must be a California admitted surety insurer as defined in the Code of Civil Procedure section 995.120.

1.1.41. SWPPP: The District's Storm Water Pollution Prevention Plan.

1.1.42. Terms. The term "provide" means "provide complete in place" or to "furnish and install" such item. Unless otherwise provided in the Contract Documents, the terms "approved;" "directed;" "satisfactory;" "accepted;" "acceptable;" "proper;" "required;" "necessary" and "equal" shall mean as approved, directed, satisfactory, accepted, acceptable, proper, required, necessary and equal, in the opinion of the District. The term "typical" as used in the Drawings shall require the installation or furnishing of such item(s) of the Work designated as "typical" in all other areas similarly marked as

"typical"; Work in such other areas shall conform to that shown as "typical" or as reasonably inferable therefrom.

1.1.43. Unilateral Change Order: A written order prepared and issued by the District, the Construction Manager, and/or the Architect and signed by the District and the Architect, directing a change in the Work. **A Unilateral Change Order is NOT a Construction Change Document (which is defined above as a Change Order that DSA must approve).**

1.1.44. Work: All labor, materials, equipment, components, appliances, supervision, coordination, and services required by, or reasonably inferred from, the Contract Documents, that are necessary for the construction and Completion of the Project.

1.2. Laws Concerning the Contract

Contract is subject to all provisions of the Constitution and laws of California and the United States, governing, controlling, or affecting District, or the property, funds, operations, or powers of District, and such provisions are by this reference made a part hereof. Any provision required by law to be included in this Contract shall be deemed to be inserted.

1.3. No Oral Agreements

No oral agreement or conversation with any officer, agent, or employee of District, either before or after execution of Contract, shall affect or modify any of the terms or obligations contained in the Contract Documents.

1.4. No Assignment

Contractor shall not assign the Contract or any part thereof including, without limitation, any services or money to become due without the prior written consent of the District. Assignment without District's prior written consent shall be null and void. Any assignment of money due or to be come due under the Contract shall be subject to a prior lien for services rendered or material supplied for Work performed in favor of all persons, firms, or corporations rendering services or supplying material to the extent that claims are filed pursuant to the Civil Code, Code of Civil Procedure, Government Code, Labor Code, and/or Public Contract Code, and shall also be subject to deductions for Liquidated Damages or withholding of payments as determined by District in accordance with the Contract. Contractor shall not assign or transfer in any manner to a Subcontractor or supplier the right to prosecute or maintain an action against the District.

1.5. Confidentiality

Contractor shall maintain the confidentiality of all information, documents, programs, procedures and all other items that Contractor encounters while performing the Work. This requirement shall be ongoing and shall survive the expiration or termination of the Contract and specifically includes, without limitation, all student, parent, and employee disciplinary information and health information.

1.6. Notice and Service Thereof

Any notice required by the Contract shall be in writing, dated and signed by the party giving notice or by a duly authorized representative of that party and pursuant to the provisions in the Agreement.

1.7. No Waiver

The failure of District in any one or more instances to insist upon strict performance of any term of the Contract or to exercise any District option shall not be construed as a waiver or relinquishment of the

right to assert or rely upon any such term or option on a future occasion. No action or failure to act by the District, Architect, or Construction Manager shall constitute a waiver of any right or duty afforded the District under the Contract, nor shall any action or failure to act constitute an approval of or acquiescence in any breach hereunder, except as may be specifically agreed in writing.

1.8. Substitutions for Specified Items

1.8.1. Requests for substitutions prior to award of the Contract shall be submitted within the time period indicated in the Instructions to Bidders.

1.8.2. Requests for substitutions after award of the Contract shall be submitted within **THIRTY-FIVE** (**35**) days of the date of the Notice of Award. This time period may be extended by the District only, in its sole discretion.

1.8.3. Whenever in the Specifications any materials, process, or article is indicated or specified by grade, patent, or proprietary name, or by name of manufacturer, that Specification shall be deemed to be followed by the words "or equal." Contractor may, unless otherwise stated, offer any material, process, or article that shall be substantially equal or better in every respect to that so indicated or specified.

1.8.3.1. If the material, process, or article offered by Contractor is not, in the opinion of the District, substantially equal or better in every respect to that specified, then Contractor shall furnish the material, process, or article specified in the Specifications without any additional compensation or change order.

1.8.3.2. This provision shall not be applicable with respect to any material, product, thing or service for which District made findings and gave notice in accordance with Public Contract Code section 3400(b); therefore, Contractor shall not be entitled to request a substitution with respect to those materials, products or services.

1.8.4. A request for a substitution shall be in writing and shall include:

1.8.4.1. All variations of the proposed substitute from the material specified including, but not limited to, principles of operation, materials, or construction finish, thickness or gauge of materials, dimensions, weight, and tolerances;

1.8.4.2. Available maintenance, repair or replacement services;

1.8.4.3. Increases or decreases in operating, maintenance, repair, replacement, and spare parts costs;

1.8.4.4. Whether or not acceptance of the substitute will require other changes in the Work (or in work performed by the District or others under Contract with the District); and

1.8.4.5. The time impact on any part of the Work resulting directly or indirectly from acceptance of the proposed substitute.

1.8.5. No substitutions shall be made until approved, in writing, by the District. The burden of proof as to equality of any material, process, or article shall rest with Contractor. The Contractor warrants that if substitutes are approved:

1.8.5.1. The proposed substitute is equal or superior in all respects to that specified, and that such proposed substitute is suitable and fit for the intended purpose and will perform adequately the function and achieve the results called for by the general design and the Contract Documents;

1.8.5.2. The Contractor provides the same warranties and guarantees for the substitute that would be provided for that specified;

1.8.5.3. The Contractor shall be fully responsible for the installation of the substitute and any changes in the Work required, either directly or indirectly, because of the acceptance of such substitute, with no increase in Contract Price or Contract Time. Incidental changes or extra component parts required to accommodate the substitute will be made by the Contractor without a change in the Contract Price or Contract Time;

1.8.5.4. The Contractor shall be responsible for any re-design costs occasioned by District's acceptance and/or approval of any substitute; and

1.8.5.5. The Contractor shall, in the event that a substitute is less costly than that specified, credit the District with one hundred percent (100%) of the net difference between the substitute and the originally specified material. In this event, the Contractor agrees to execute a deductive Change Order to reflect that credit.

1.8.6. In the event Contractor furnishes a material, process, or article more expensive than that specified, the difference in the cost of that material, process, or article so furnished shall be borne by Contractor.

1.8.7. In no event shall the District be liable for any increase in Contract Price or Contract Time due to any claimed delay in the evaluation of any proposed substitute or in the acceptance or rejection of any proposed substitute.

1.8.8. If the District approves a substitution after the award of the Contract, the District shall memorialize that approval in a Change Order or other applicable Contract modification process.

1.9. Materials and Work

1.9.1. Except as otherwise stated in the Contract, Contractor shall provide and pay for all materials, labor, tools, equipment, transportation, supervision, temporary constructions of every nature, and all other services, management, and facilities of every nature whatsoever necessary to execute and complete the Contract within the Contract Time.

1.9.2. Unless otherwise specified, all materials shall be new and the best of their respective kinds and grades as noted or specified, and workmanship shall be of good quality.

1.9.3. Materials shall be furnished in sufficient quantities and at such times as to ensure uninterrupted progress of Work and shall be stored properly and protected as required.

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

1.9.5. Contractor shall, after award of Contract by District and after relevant submittals have been approved, place orders for materials and/or equipment as specified so that delivery of same may be made without delays to the Work. Contractor shall, upon demand from District, present documentary evidence showing that orders have been placed.

1.9.6. District reserves the right but has no obligation, for any neglect in complying with the above instructions, to place orders for such materials and/or equipment as it may deem advisable in order that the Work may be completed at the date specified in the Agreement, and all expenses incidental to the procuring of said materials and/or equipment shall be paid for by Contractor or withheld from payment(s) to Contractor.

1.9.7. Contractor warrants good title to all material, supplies, and equipment installed or incorporated in Work and agrees upon Completion of all Work to deliver the Site to District, together with all improvements and appurtenances constructed or placed thereon by it, and free from any claims, liens, or charges. Contractor further agrees that neither it nor any person, firm, or corporation furnishing any materials or labor for any Work shall have any right to lien any portion of the Premises or any improvement or appurtenance thereon, except that Contractor may install metering devices or other equipment of utility companies or of political subdivision, title to which is commonly retained by utility company or political subdivision. In the event of installation of any such metering device or equipment, Contractor shall advise District as to owner thereof.

1.9.8. Nothing contained in this Article, however, shall defeat or impair the rights of persons furnishing materials or labor under any bond given by Contractor for their protection or any rights under law permitting such protection or any rights under law permitting such persons to look to funds due Contractor in hands of District (e.g., stop payment notices). This provision shall be inserted in all subcontracts and material contracts and notice of its provisions shall be given to all persons furnishing material for work when no formal contract is entered into for such material.

1.9.9. Title to new materials and/or equipment for the Work and attendant liability for its protection and safety shall remain with Contractor until incorporated in the Work of this Contract and accepted by District. No part of any materials and/or equipment shall be removed from its place of storage except for immediate installation in the Work. Contractor shall keep an accurate inventory of all materials and/or equipment in a manner satisfactory to District or its authorized representative and shall, at the District's request, forward it to the District.

1.9.10. Contractor certifies that it shall comply with the recycled product requirements of Public Contract Code section 22150, et seq., including, without limitation, section 22154 which states, "All businesses shall certify in writing to the contracting officer, or his or her representative, the minimum, if not exact, percentage of postconsumer material in the products, materials, goods, or supplies being offered or sold to any local public entity."

2. DISTRICT

2.1. The governing board of the District or its designees will act for the District in all matters pertaining to the Contract.

2.2. The District may, at any time,

2.2.1. Direct the Contractor to communicate with or provide notice to the Construction Manager or the Architect on matters for which the Contract Documents indicate the Contractor will communicate with or provide notice to the District; and/or

2.2.2. Direct the Construction Manager or the Architect to communicate with or direct the Contractor on matters for which the Contract Documents indicate the District will communicate with or direct the Contractor.

2.3. **District's Rights if Contractor Fails to Perform**. If the District at any time believes that the Contractor is behind schedule, is failing to construct the Project pursuant to the Contract Documents or is otherwise failing to perform any provisions of this Contract, the District, after **FORTY-EIGHT (48)** hours written

notice to the Contractor, may take any action necessary or beneficial to the District to complete the Project, takeover the Work of the Contract, terminate or suspend the Contract as indicated herein, or any combination or portion of those actions. The Contractor and the Surety shall be liable to the District for any cost incurred by the District in those actions and the District has the right to deduct the cost thereof from any payment then or thereafter due the Contractor.

3. ARCHITECT

3.1. Architect shall have the authority to act on behalf of District to the extent expressly provided in the Contract Documents and to the extent determined by District to, among other things, observe the progress and quality of the Work on behalf of the District.

3.2. Architect shall have authority to reject materials, workmanship, and/or the Work whenever rejection may be necessary, in Architect's reasonable opinion, to insure the proper execution of the Contract and if Work is defective or does not conform to the requirements of the Contract Documents. Whenever the Architect considers it necessary or advisable, for implementation of the intent of the Contract Documents, the Architect will have authority to require additional inspections or testing of the Work, whether or not such Work is fabricated, installed or completed. Neither this authority of the Architect nor a decision made in good faith by the Architect to exercise or not to exercise that authority shall give rise to a duty or responsibility to the Contractor, Subcontractors, material suppliers, their agents or employees, or other persons performing portions of the Work.

3.3. Architect shall, with the District and on behalf of the District, determine the amount, quality, acceptability, and fitness of all parts of the Work, and interpret the Specifications, Drawings, and shall, with the District, interpret all other Contract Documents.

3.4. Architect shall have all authority and responsibility established by law, including Title 24 of the California Code of Regulations.

3.5. Contractor shall provide District and the Construction Manager with a copy of all written communication between Contractor and Architect at the same time as that communication is made to Architect, including, without limitation, all RFIs, correspondence, submittals, claims, and proposed change orders.

4. CONSTRUCTION MANAGER

4.1. If a Construction Manager is used on this Project, the Construction Manager will provide administration of the Contract on the District's behalf. After execution of the Contract and Notice to Proceed, all correspondence and/or instructions from Contractor and/or District shall be forwarded through the Construction Manager. The Construction Manager will not be responsible for and will not have control or charge of construction means, methods, techniques, sequences, or procedures or for safety precautions in connection with the Work, which shall all remain the Contractor's responsibility.

4.2. Construction Manager, however, will have authority to reject materials and/or workmanship not conforming to the Contract Documents, as determined by the District, the Architect, and/or the Project Inspector. Construction Manager shall also have the authority to require special inspection or testing of any portion of the Work, whether it has been fabricated, installed, or fully completed. Any decision made by Construction Manager, in good faith, shall not give rise to any duty or responsibility of the Construction Manager to the Contractor, any Subcontractor, their agents, employees, or other persons performing any of the Work. Construction Manager shall have free access to all parts of Work at any time.

4.3. If the District does not use a Construction Manager on this Project, all references to Construction Manager or CM shall be read as District.

5. INSPECTOR, INSPECTIONS AND TESTS

5.1. Project Inspector

5.1.1. One or more Project Inspector(s), including special Project Inspector(s), as required, will be assigned to the Work by District, in accordance with requirements of Title 24, part 1, of the California Code of Regulations, to enforce the building code and monitor compliance with Plans and Specifications for the Project previously approved by the DSA. Duties of Project Inspector(s) are specifically defined in section 4-342 of said part 1 of Title 24.

5.1.2. No Work shall be carried on except with the knowledge and under the inspection of the Project Inspector(s). The Project Inspector(s) shall have free access to all parts of Work at any time. Contractor shall furnish Project Inspector(s) reasonable opportunities for obtaining such information as may be necessary to keep Project Inspector(s) fully informed respecting progress and manner of work and character of materials. Inspection of Work shall not relieve Contractor from the obligation to fulfill the Contract. Project Inspector(s) and the DSA are authorized to stop work whenever the Contractor and/or its Subcontractor(s) are not complying with the Contract Documents. Any work stoppage by the Project Inspector(s) and/or DSA shall be without liability to the District. Contractor shall instruct its Subcontractors and employees accordingly.

5.1.3. If Contractor and/or any Subcontractor requests that the Project Inspector(s) perform any inspection off-site, this shall only be done if it is allowable pursuant to applicable regulations and DSA, if the Project Inspector(s) agree to do so, and at the expense of the Contractor.

5.1.4. Limitations on Project Inspector Authority. The Project Inspector does not have authority to interpret the Contract Documents or to modify the Work depicted in the Contract Documents. No Work inconsistent with the Contract Documents shall be performed solely on the basis of the direction of the Project Inspector, and the Contractor shall be liable to the District for the consequences of all Work performed on such basis.

5.2. Tests and Inspections

5.2.1. Tests and Inspections shall comply with Title 24, part 1, California Code of Regulations, group 1, article 5, section 4-335, and with the provisions of the Specifications.

5.2.2. If the Contract Documents, laws, ordinances or any public authority with jurisdiction over the Work requires the Work, or any portion thereof, to be specially tested, inspected or approved, the Contractor shall give the Architect, the Construction Manager and the Project Inspector written notice of the readiness of such Work for observation, testing or inspection at least seventy-two (72) hours prior to the time for the conducting of such test, inspection or observation. If inspection, testing or observation is by authority other than the District, the Contractor shall inform the Project Inspector and the Construction Manager not less than seventy-two (72) hours prior to the date fixed for such inspection, test or observation. The Contractor shall not cover up any portion of the Work subject to tests, inspections or observations prior to the completion and satisfaction of the requirements of such test, inspection or observation. In the event that any portion of the Work subject to tests, inspection or approval shall be covered up by Contractor prior to completion and satisfaction of the requirements of such tests, inspection or approval, Contractor shall be responsible for the uncovering of such portion of the Work as is necessary for performing such tests, inspection or approval without adjustment of the Contract Price or the Contract Time on account thereof.

5.2.3. The District will select an independent testing laboratory to conduct the tests. Selection of the materials required to be tested shall be by the laboratory or the District's representative and not by the Contractor. The Contractor shall notify the District's representative a sufficient time in advance of its readiness for required observation or inspection.

5.2.4. The Contractor shall notify the District's representative a sufficient time in advance of the

manufacture of material to be supplied under the Contract Documents, that must by terms of the Contract Documents be tested, in order that the District may arrange for the testing of same at the source of supply. This notice shall be, at a minimum, seventy-two (72) hours prior to the manufacture of the material that must be tested.

5.2.5. Any material shipped by the Contractor from the source of supply prior to having satisfactorily passed required testing and inspection or prior to the receipt of notice from the representative that testing and inspection will not be required, shall not be incorporated into and/or onto the Project.

5.2.6. The District will select and pay testing laboratory costs for all tests and inspections. Costs of tests of any materials found to be not in compliance with the Contract Documents shall be paid for by the District and reimbursed by the Contractor or deducted from the Contract Price.

5.3. Costs for After Hours and/or Off Site Inspections

5.3.1. If the Contractor performs Work outside the Inspector's regular working hours, over a period of more than eight (8) hours per day by any single person, on weekends/holidays or requests the Inspector to perform inspections off Site, then the costs of any inspections required outside regular working hours, over a period of more than eight (8) hours per day by any single person, on weekends/holidays or off Site, shall be borne by the Contractor and may be invoiced to the Contractor by the District or the District may deduct those expenses from the next Progress Payment.

6. CONTRACTOR

Contractor shall construct the Work for the Contract price including any adjustment(s) to the Contract Price pursuant to provisions herein regarding changes to the Contract Price. Except as otherwise noted, Contractor shall provide and pay for all labor, materials, equipment, permits, fees, licenses, facilities, transportation, taxes, and services necessary for the proper execution and Completion of the Work, except as indicated herein.

6.1. Status of Contractor

6.1.1. Contractor is and shall at all times be deemed to be an independent contractor and shall be wholly responsible for the manner in which it and its Subcontractors perform the services required of it by the Contract Documents. Nothing herein contained shall be construed as creating the relationship of employer and employee, or principal and agent, between the District, or any of the District's employees or agents, and Contractor or any of Contractor's Subcontractors, agents or employees. Contractor assumes exclusively the responsibility for the acts of its employees as they relate to the services to be provided during the course and scope of their employment. Contractor, its Subcontractors, agents, and its employees shall not be entitled to any rights or privileges of District employees. District shall be permitted to monitor the Contractor's activities to determine compliance with the terms of the Contract.

6.1.2. As required by law, Contractor and all Subcontractors shall be properly licensed and regulated by the Contractor's State License Board, located at 9821 Business Park Drive, , Sacramento, California 95827, with a mailing address of Post Office Box 26000, Sacramento, California, and with a website at http://www.cslb.ca.gov.

6.2. Contractor's Supervision

6.2.1. During progress of the Work, Contractor shall keep on the Premises, and at all other locations where any Work related to the Contract is being performed, a competent project manager and construction superintendent who are employees of the Contractor, to whom the District does not object and at least one of whom shall be fluent in English, written and verbal.

6.2.2. The project manager and construction superintendent shall both speak fluently the predominant language of the Contractor's employees.

6.2.3. Before commencing the Work, Contractor shall give written notice to District of the name of its project manager and construction superintendent. Neither the Contractor's project manager nor construction superintendent shall be changed except with prior written notice to District, unless the Contractor's project manager and/or construction superintendent proves to be unsatisfactory to Contractor, District, any of the District's employees, agents, the Construction Manager, or the Architect, in which case, Contractor shall notify District in writing. District retains the right to reasonably refuse Contractor's replacement personnel The Contractor's project manager and construction superintendent shall each represent Contractor, and all directions given to Contractor's project manager and/or construction superintendent shall be as binding as if given to Contractor.

6.2.4. Contractor shall give efficient supervision to Work, using its best skill and attention. Contractor shall carefully study and compare all Contract Documents, Drawings, Specifications, and other instructions and shall at once report to District, Construction Manager, and Architect any error, inconsistency, or omission that Contractor or its employees and Subcontractors may discover, in writing, with a copy to District's Project Inspector(s). The Contractor shall have responsibility for discovery of errors, inconsistencies, or omissions.

6.2.5. The Contractor's project manager shall devote sufficient time to the Project on site, and in the Contractor's home office to pre-plan activities to meet the Construction Schedule and fulfill all Contract obligations. This includes making timely submittals, issuing and disseminating necessary RFI's, promptly processing and distributing bulletins, change orders and payments, keeping required logs current etc. If any of these activities fall behind contract requirements or dates necessary to complete the Project on time, the Contractor must provide a full time project manager on the Project Site dedicated solely to the Project, until the deficiencies are corrected.

6.2.6. The Contractor shall verify all indicated dimensions before ordering materials or equipment, or before performing Work. The Contractor shall take field measurements, verify field conditions, and shall carefully compare such field measurements and conditions and other information known to the Contractor with the Project Documents before commencing work. Errors, inconsistencies or omissions discovered shall be immediately reported to the District. Upon commencement of any item of Work, the Contractor shall be responsible for dimensions related to the Work and shall make any corrections necessary to make Work properly fit at no additional cost to District. This responsibility for verification of dimensions is a non-delegable duty and may not be delegated to subcontractors or agents.

6.2.7. Omissions from the Drawings or Specifications, or the misdescription of details of Work which are manifestly necessary to carry out the intent of the Drawings and Specifications, or which are customarily performed, shall not relieve the Contractor from performing such omitted or misdescribed Work, but they shall be performed as if fully and correctly set forth and described in the Drawings and Specifications.

6.2.8. The Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction. The Contractor shall be responsible to see that the finished Work complies accurately with the Contract Documents.

6.3. Duty to Provide Fit Workers

6.3.1. Contractor and Subcontractor(s) shall at all times enforce strict discipline and good order among their employees and shall not employ or work any unfit person or anyone not skilled in work assigned to that person. It shall be the responsibility of Contractor to ensure compliance with this requirement. District may require Contractor to permanently remove unfit persons from Project Site.

6.3.2. Infectious Diseases or Viruses. Contractor shall ensure that all its employees and employees of its subcontractors shall comply with all applicable and existing federal, state, and/or local statutes, orders, rules, regulations, ordinances, and/or directives relating to construction site safety in connection with any pandemic, public health emergency, infectious disease or virus (e.g., COVID-19 or derivative strain, etc.).

6.3.3. Any person in the employ of Contractor or Subcontractor(s) whom District may deem incompetent or unfit shall be excluded from working on the Project and shall not again be employed on the Project except with the prior written consent of District.

6.3.4. The Contractor shall furnish labor that can work in harmony with all other elements of labor employed or to be employed in the Work.

6.3.5. If Contractor intends to make any change in the name or legal nature of the Contractor's entity, Contractor must first notify the District. The District shall determine if Contractor's intended change is permissible while performing the Contract.

6.3.6. Compliance with Immigration Reform and Control Act of 1986. As required by law, Contractor and all Subcontractors shall employ individuals for the Work in conformity with the Immigration Reform and Control Act of 1986, 8 USC §§1101 et seq.

6.4. <u>Personnel</u>

6.4.1. Contractor, Contractor's employees, Subcontractors, Subcontractors' employees, or any person associated with the Work shall conduct themselves in a manner appropriate for a school site. The District will not permit any (1) verbal or physical contact with neighbors, students, and faculty; (2) profanity, or inappropriate attire or behavior; (3) photographing, videoing, or audio recording of any neighbors, students, and faculty or any posting of any photographs, videos, or audio recordings of any neighbors, students, and faculty on any internet site, social media platform of any kind, regardless of source of any photograph, video, or audio recording. District may require Contractor to permanently remove noncomplying persons from Project Site.

6.4.2. The Contractor shall employ a full-time superintendent and necessary assistants who shall have complete authority to represent and act on behalf on the Contractor on all matters pertaining to the Work. The superintendent shall be competent and have a minimum of five (5) years' experience in construction supervision on projects of similar scale and complexity. The superintendent shall be satisfactory to the District and, if not satisfactory, shall be replaced by the Contractor with one that is acceptable to the District. The superintendent shall not be changed without the written consent of the District unless the superintendent ceases to be employed by the Contractor.

6.4.3. The Contractor shall employ a competent estimator and necessary assistants, or contact for sufficient services of an estimating consultant and to process proposed change orders. The estimator shall have a minimum of five (5) years' experience in estimating. The estimator shall be satisfactory to the District and, if not satisfactory, shall be replaced by the Contractor with one that is acceptable. The Contractor shall submit PCO's requested by the District within fourteen (14) calendar days.

6.4.4. The Contractor shall employ a competent scheduler and necessary assistants, or contract for sufficient services of a scheduling consultant. The scheduler shall have a minimum of five (5) years' experience in scheduling. The scheduler shall be satisfactory to the District and, if not satisfactory, shall be replaced by the Contractor with one that is acceptable.

6.4.5. Contractor shall at all times enforce strict discipline and good order among Contractor's employees, and shall not employ on the Project any unfit person or anyone not skilled in the task assigned.

6.4.6. If Contractor or any Subcontractor on the Project site fails to comply with any provision herein, the District may have the offending person(s) immediately removed from the Site, and the person(s) shall be replaced within three (3) days, at no additional expense to the District. Contractor, on behalf of it and its Subcontractors, hereby waives any claim that the provisions of this paragraph or the enforcement thereof interferes, or has the potential to interfere, with its right to control the means and methods of its performance and duties under this Contract.

6.5. Prohibition on Harassment

6.5.1. In addition to the non-discrimination requirements in the Contract Documents, the Contractor and all Subcontractors must comply with these provisions prohibiting harassment at the Site. The District is committed to providing a campus and workplace free of sexual harassment and harassment based on factors such as race, color religion, national origin, ancestry, age, medical condition, marital status, disability or veteran status. Harassment includes without limitation, verbal, physical or visual conduct which creates an intimidating, offensive or hostile environment such as racial slurs; ethnic jokes; posting of offensive statements, posters or cartoons or similar conduct. Sexual harassment includes without limitation the solicitation of sexual favors, unwelcome sexual advances, or other verbal, visual or physical conduct of a sexual nature.

6.5.2. Contractor shall take all reasonable steps to prevent harassment from occurring, including without limitation affirmatively raising the subject of harassment among its employees, expressing strong disapproval of any form of harassment, developing appropriate sanctions, informing employees of their right to raise and how to raise the issue of harassment and informing complainants of the outcome of an investigation into a harassment claim.

6.5.3. Contractor shall not permit any person, whether employed by Contractor or a Subcontractor or any other person or entity, performing any Work at or about the Site to engage in any prohibited form of harassment. Any person performing or providing Work on or about the Site engaging in a prohibited form of harassment directed to any student, faculty member or staff of the District or directed to any other person on or about the Site shall be subject to immediate removal and shall be prohibited thereafter from providing or performing any portion of the Work. Upon the District's receipt of any notice or complaint that any person employed directly or indirectly by Contractor on any Subcontractor in performing or providing the Work has engaged in a prohibited form of harassment, the District will promptly undertake an investigation of such notice or complaint. In the event that the District, after such investigation, reasonably determines that a prohibited form of harassment has occurred, the District shall promptly notify the Contractor of the same and direct that the person engaging in such conduct be immediately removed from the Site. Unless the District's determination that a prohibited form of harassment has occurred is grossly negligent or without reasonable cause, District shall have no liability for directing the removal of any person determined to have engaged in a prohibited form of harassment nor shall the Contract Price or the Contract Time be adjusted on account thereof. The indemnity provisions of the Contract Documents apply to any assertion by any person dismissed from performing or providing work at the direction of the District pursuant to this provision; or (ii) the assertion by any person that any person directly or indirectly under the employment or direction of the Contractor has engaged in a prohibited form of harassment directed to or affecting such person. The obligations of the Contractor and the Surety under the preceding sentence are in addition to, and not in lieu of, any other obligation of defense, indemnity and hold harmless whether arising under the Contract Documents, at law or otherwise; these obligations survive completion of the Work or the termination of the Contract.

6.6. Conferences and Meetings.

6.6.1. In addition to the conference and meeting requirements in the Specifications, Contractor's supervisory personnel for the Work and the Contractor's management personnel shall attend all required meetings as required by the Contract Documents or as requested by the District. The Contractor's personnel participating in conferences and meetings relating to the Work shall be authorized to act on

behalf of the Contractor and to bind the Contractor. The Contractor is solely responsible for arranging for the attendance by Subcontractors and Material Suppliers at meetings and conferences relating to the Work as necessary, appropriate or as requested by the District.

6.6.2. Preconstruction Conference. The Contractor's representatives (and representatives of Subcontractors as requested by the District) shall attend a preconstruction conference at such time and place as designated by the District. The preconstruction conference will generally address the requirements of the Work and Contract Documents, and to establish construction procedures. Subject matters of the preconstruction conference will include as appropriate: (a) administrative matters, including an overview of the respective responsibilities of the District, Architect, Construction Manager, Contractor, Subcontractors, Project Inspector, and others performing any part of the Work or services relating to the Work; (b) Submittals; (c) Changes; (d) employment practices, including Certified Payroll preparation and submission and prevailing wage rate responsibilities of the Contractor and Subcontractors; (e) Progress Schedule development and maintenance; (f) development of Schedule of Values and payment procedures; (g) implementation of BIM, if applicable; (h) communication procedures, including the handling of Requests for Information; (i) emergency and safety procedures; (j) Site visitor policies; (k) conduct of Contractor/Subcontractor personnel at the Site; and (l) Completion, Punchlist and closeout procedures.

6.6.3. Progress Meetings. Progress meetings will be conducted on regular intervals (weekly unless otherwise expressly indicated elsewhere in the Contract Documents). The Contractor's representatives and representatives of Subcontractors (as requested by the District) shall attend progress meetings. Progress Meetings will be chaired by the District or the Construction Manager and will generally include as agenda items: Site safety, field issues, coordination of Work, construction progress and impacts to timely Completion, if any. The purposes of the progress meetings include: a formal and regular forum for discussion of the status and progress of the Work by all Project participants, a review of progress or resolution of previously raised issues and action items assigned to the Project participants, and reviews of the Progress schedule and submittals. Contractor shall prepare and submit at each progress meeting a three (3) week look-ahead schedule identifying all planned activities for the next three (3) weeks and any deviations from activities in the current Construction Schedule.

6.6.4. Special Meetings. As deemed necessary or appropriate by the District, special meetings will be conducted with the participation of the Contractor, Subcontractors and other Project participants as requested by the District.

6.6.5. Minutes of Meetings. Following conclusion of the preconstruction conference, progress meetings and special meetings, the Architect or the Construction Manager will prepare and distribute minutes reflecting the items addressed and actions taken at a meeting or conference. Unless the Contractor notifies the Architect and the Construction Manager in writing of objections or corrections to minutes prepared hereunder within five (5) days of the date of distribution of the minutes, the minutes as distributed shall constitute the official record of the meeting or conference. No objections or corrections of any Subcontractor or Material Supplier shall be submitted directly to the Architect or the Construction Manager; such objections or corrections shall be submitted to the Architect and the Construction Manager through the Contractor. If the Contractor timely interposes objections or notes corrections, the resolution of such matters shall be addressed at the next scheduled progress meeting.

6.7. <u>Purchase of Materials and Equipment</u>

6.7.1. The Contractor is required to order and obtain materials and equipment sufficiently in advance of its Work at no additional cost or advance payment from District to ensure against price escalations or delays. All materials and equipment shall be stored on-Site and secured by Contractor unless otherwise approved in writing by the District.

6.7.2. Off-Site Storage of Materials and Equipment Only Upon District's Written Consent. If

Contractor intends to store materials and/or equipment off site after District has paid for those materials and/or equipment, Contractor must first obtain the District's express, written consent. If Contractor receives District's consent to store materials and/or equipment off site ("Stored Materials"), Contractor shall comply with all of the following:

6.7.2.1. Property of Others Insurance. Contractor shall procure and maintain, during the entire time Stored Materials are in off-site storage, insurance coverage acceptable to the District that shall protect Contractor and District from all claims for Stored Materials that are lost, stolen, or damaged. The District shall be named as a loss payee for this insurance coverage. The insurance coverage shall include a "loss payable endorsement" stating that all amounts payable will be paid as a joint-check to the Contractor and District. If approved in advance by District, this required insurance may be obtained by an "Employee Theft Protection Insurance Policy" or an "Employee Theft Protection Bond."

6.7.2.2. Payment for Stored Materials. District shall only make payment to Contractor for Stored Materials if agreed upon in advance, in writing, by the District and provided that Contractor submits an itemized list of all Stored Materials with Contractor's Application for Payment. Contractor's itemized list of all Stored Materials shall be supported by all of the following:

6.7.2.2.1. Itemized breakdown of the Stored Materials for the purpose of requesting partial payment, identifying the serial numbers and exact storage location of each piece of equipment and material; and

6.7.2.2.2. Verified invoices for the Stored Materials; and

6.7.2.2.3. Original copy of Property of Others Insurance, Employee Theft Protection Insurance Policy, or an Employee Theft Protection Bond based on the type of insurance required by the District. These documents shall include certificates and endorsements stating the coverage and that the District is a loss payee or obligee, as appropriate.

6.7.2.2.4. An express, signed document from Contractor indicating that the District may, at any time and at its sole discretion, have unhindered and unqualified access to all Stored Materials and to remove the Stored Materials.

6.8. <u>Documents on Work</u>

6.8.1. Contractor shall at all times keep on the Work Site, or at another location as the District may authorize in writing, one legible copy of all Contract Documents, including Addenda and Change Orders, and current titles 19 and 24 of the California Code of Regulations, the specified edition(s) of the California Building Standards Code (electronic versions are acceptable), all approved Drawings, Plans, Schedules, and Specifications, and all codes and documents referred to in the Specifications, and made part thereof. These documents shall be kept in good order and available to District, Construction Manager, Architect, Architect's representatives, the Project Inspector(s), and all authorities having jurisdiction. Contractor shall be acquainted with and comply with the provisions of these titles as they relate to this Project. (See particularly the duties of Contractor, Title 24, part 1, California Code of Regulations, section 4-343.) Contractor shall also be acquainted with and comply with all California Code of Regulations provisions relating to conditions on this Project, particularly titles 8 and 17. Contractor shall coordinate with Architect and Construction Manager and shall submit its verified report(s) according to the requirements of Title 24.

6.8.2. Daily Job Reports.

6.8.2.1. Contractor shall maintain, at a minimum, at least one (1) set of Daily Job Reports on the

Project. These must be prepared by the Contractor's employee(s) who are present on Site, and must include, at a minimum, the following information:

6.8.2.1.1. A brief description of all Work performed on that day.

6.8.2.1.2. A summary of all other pertinent events and/or occurrences on that day.

6.8.2.1.3. The weather conditions on that day.

6.8.2.1.4. A list of all Subcontractor(s) working on that day,

6.8.2.1.5. A list of each Contractor employee working on that day and the total hours worked for each employee.

6.8.2.1.6. A complete list of all equipment on Site that day, whether in use or not.

6.8.2.1.7. A complete list of all materials, supplies, and equipment delivered on that day.

6.8.2.1.8. A complete list of all inspections and tests performed on that day.

6.8.2.2. Each day Contractor shall provide a copy of the previous day's Daily Job Report to the District or the District's Construction Manager.

6.9. Preservation of Records

District shall have the right to examine and audit all Daily Job Reports or other Project records of Contractor's project manager(s), project superintendent(s), and/or project foreperson(s), all certified payroll records and/or related documents including, without limitation, payroll, payment, timekeeping and tracking documents; all books, estimates, records, contracts, documents, bid documents, bid cost data, subcontract job cost reports, and other data of the Contractor, any Subcontractor, and/or supplier, including computations and projections related to bidding, negotiating, pricing, or performing the Work or Contract modification, in order to evaluate the accuracy, completeness, and currency of the cost, manpower, coordination, supervision, or pricing data at no additional cost to the District. These documents may be duplicative and/or be in addition to any Bid Documents held in escrow by the District. Contractor shall make available at its office at all reasonable times the materials described in this paragraph for the examination, audit, or reproduction until three (3) years after final payment under this Contract. Notwithstanding the provisions above, Contractor shall provide any records requested by any governmental agency, if available, after the time set forth above.

6.10. Integration of Work

6.10.1. Contractor shall do all cutting, fitting, patching, and preparation of Work as required to make its several parts come together properly, to fit it to receive or be received by work of other contractors, and to coordinate tolerances to various pieces of work, showing upon, or reasonably implied by, the Drawings and Specifications for the completed structure, and shall conform them as District and/or Architect may direct.

6.10.2. All cost caused by defective or ill-timed Work shall be borne by Contractor, inclusive of repair work.

6.10.3. Contractor shall not endanger any work performed by it or anyone else by cutting, excavating, or otherwise altering work and shall not cut or alter work of any other contractor except with written consent of District.

6.11. Obtaining of Permits and Licenses

6.11.1. Contractor shall secure and pay for all permits, licenses, and certificates. Contractor must review the Special Conditions for any changes or exceptions to this provision.

6.12. Work to Comply with Applicable Laws and Regulations

6.12.1. Contractor shall give all notices and comply with all applicable laws, ordinances, rules, and regulations relating to the Work, including the specific laws, ordinances, rules, and regulations as indicated and specified in the Contract Documents and identified below, including but not limited to the appropriate statutes and administrative code sections. If Contractor observes that Drawings and Specifications are at variance therewith, or should Contractor become aware of the development of conditions not covered by Contract Documents that will result in finished Work being at variance therewith, Contractor shall promptly notify District in writing and any changes deemed necessary by District shall be made as provided in Contract for changes in Work.

6.12.1.1. National Electrical Safety Code, U. S. Department of Commerce

6.12.1.2. National Board of Fire Underwriters' Regulations

6.12.1.3. California Building Standards Code , latest addition, and the California Code of Regulations, Title 24, including amendments

6.12.1.4. Manual of Accident Prevention in Construction, latest edition, published by A.G.C. of America

6.12.1.5. Industrial Accident Commission's Safety Orders, State of California

6.12.1.6. Regulations of the State Fire Marshall (Title 19, California Code of Regulations) and Pertinent Local Fire Safety Codes

6.12.1.7. Americans with Disabilities Act

6.12.1.8. Education Code of the State of California

6.12.1.9. Government Code of the State of California

6.12.1.10. Labor Code of the State of California, division 2, part 7, Public Works and Public Agencies

6.12.1.11. Public Contract Code of the State of California

6.12.1.12. California Art Preservation Act

6.12.1.13. U. S. Copyright Act

6.12.1.14. U. S. Visual Artists Rights Act

6.12.2. Contractor shall comply will all applicable mitigation measures, if any, adopted by any public agency with respect to this Project pursuant to the California Environmental Quality Act ("CEQA") (Public Resources Code sections 21000 et. seq.) (Also see the Special Conditions.)

6.12.3. If Contractor performs any Work that it knew, or through exercise of reasonable care should have known, to be contrary to any applicable laws, ordinance, rules, or regulations, Contractor shall bear all costs arising therefrom.

6.12.4. Where Specifications or Drawings state that materials, processes, or procedures must be approved by the DSA, State Fire Marshall, or other body or agency, Contractor shall be responsible for satisfying requirements of such bodies or agencies.

6.13. Safety/Protection of Persons and Property

6.13.1. Contractor will be solely and completely responsible for conditions of the Work 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.

6.13.2. Infectious Diseases or Viruses. Contractor is responsible for complying with all applicable and existing federal, state, and/or local statutes, orders, rules, regulations, ordinances, and/or directives relating to construction site safety in connection with any pandemic, public health emergency, infectious disease or virus (e.g., COVID-19 or derivative strain, etc.). Contractor shall ensure it has supervisor employees onsite that are trained and knowledgeable of all of these requirements to ensure full compliance on Project Site(s).

6.13.3. The wearing of hard hats will be mandatory at all times for all personnel on Site. Contractor shall supply sufficient hard hats to properly equip all employees and visitors.

6.13.4. Any construction review of the Contractor's performance is not intended to include review of the adequacy of the Contractor's safety measures in, on, or near the Work Site.

6.13.5. Implementation and maintenance of safety programs shall be the sole responsibility of the Contractor.

6.13.6. Contractor shall furnish to the District a copy of the Contractor's Safety Plan within the time frame indicated in the Contract Documents and specifically adapted for the Project.

6.13.7. Contractor shall be responsible for all damages to persons or property that occur as a result of its fault or negligence in connection with the performance of the Contract and shall take all necessary measures and be responsible for the proper care and completion and final acceptance by District. All Work shall be solely at Contractor's risk with the exception of damage to the Work caused by "acts of God" as defined in Public Contract Code section 7105.

6.13.8. Contractor shall take, and require Subcontractors to take, all necessary precautions for safety of workers on the Project and shall comply with all applicable federal, state, local, and other safety laws, standards, orders, rules, regulations, and building codes to prevent accidents or injury to persons on, about, or adjacent to premises where Work is being performed and to provide a safe and healthful place of employment. Contractor shall furnish, erect, and properly maintain at all times, all necessary safety devices, safeguards, construction canopies, signs, nets, barriers, lights, and watchmen for protection of workers and the public and shall post danger signs warning against hazards created by such features in the course of construction.

6.13.9. **Hazards Control**. Contractor shall store volatile wastes in covered metal containers and remove them from the Site daily. Contractor shall prevent accumulation of wastes that create hazardous conditions. Contractor shall provide adequate ventilation during use of volatile or noxious substances.

6.13.10. Contractor shall designate a responsible member of its organization on the Project, whose duty shall be to post information regarding protection and obligations of workers and other notices required under occupational safety and health laws, to comply with reporting and other occupational safety requirements, and to protect the life, safety, and health of workers. Name and position of person so designated shall be reported to District by Contractor.

6.13.11. Contractor shall correct any violations of safety laws, rules, orders, standards, or regulations. Upon the issuance of a citation or notice of violation by the Division of Occupational Safety and Health, Contractor shall correct such violation promptly.

6.13.12. Storm Water. Contractor shall comply with the District's Storm Water Pollution Prevention Plan (SWPPP) and, if indicated in the Special Conditions, shall be the District's Qualified SWPPP Practitioner, at no additional cost to the District.

6.13.13. In an emergency affecting safety of life or of work or of adjoining property, Contractor, without special instruction or authorization, shall act, at its discretion, to prevent such threatened loss or injury. Any compensation claimed by Contractor on account of emergency work shall be determined by agreement.

6.13.14. All salvage materials will become the property of the Contractor and shall be removed from the Site unless otherwise called for in the Contract Documents. The District reserves the right to designate certain items of value that shall be turned over to the District.

6.13.15. All connections to public utilities and/or existing on-site services shall be made and maintained in such a manner as to not interfere with the continuing use of same by the District during the entire progress of the Work.

6.13.16. Contractor shall provide such heat, covering, and enclosures as are necessary to protect all Work, materials, equipment, appliances, and tools against damage by weather conditions, such as extreme heat, cold, rain, snow, dry winds, flooding, or dampness.

6.13.17. Contractor shall protect and preserve the Work from all damage or accident, providing temporary roofs, window and door coverings, boxing, or other construction as needed. Contractor shall be responsible for existing structures, walks, roads, trees, landscaping, materials, equipment, furnishings, and/or improvements in working areas; and shall provide adequate protection therefor. If temporary removal is necessary of any of the above items, or damage occurs due to the Work, the Contractor shall replace same at its expense with same kind, quality, and size of Work or item damaged. This shall include any adjoining property of the District and others.

6.13.18. Contractor shall take adequate precautions to protect existing roads, sidewalks, curbs, pavements, utilities, adjoining property, and structures (including, without limitation, protection from settlement or loss of lateral support), and to avoid damage thereto, and repair any damage thereto caused by construction operations.

6.13.19. Contractor shall confine apparatus, the storage of materials, and the operations of workers to limits indicated by law, ordinances, permits, or directions of the District, and shall not interfere with the Work or unreasonably encumber Premises or overload any structure with materials. Contractor shall enforce all instructions of District and Architect regarding signs, advertising, fires, and require that all workers comply with all regulations while on Project Site.

6.13.20. Contractor shall take care to prevent disturbing or covering any survey markers, monuments, or other devices marking property boundaries or corners. If such markers are disturbed, Contractor shall have a civil engineer, registered as a professional engineer in California, replace them at no cost to District.

6.13.21. In the event that the Contractor enters into any agreement with owners of any adjacent property to enter upon the adjacent property for the purpose of performing the Work, Contractor shall fully indemnify, defend, and hold harmless each person, entity, firm, or agency that owns or has any interest in adjacent property. The form and content of the agreement of indemnification shall be approved by the District prior to entering the adjacent property. The Contractor shall also indemnify the District as

provided in the indemnification provision herein. These provisions shall be in addition to any other requirements of the owners of the adjacent property.

6.13.22. Infectious Disease Compliance Provisions

6.13.22.1. **Compliance with Orders.** Contractor and its Subcontractors, agents and employees thereof, are responsible for complying with all applicable and existing federal, State, and/or local statutes, orders, rules, regulations, ordinances, and/or directives in any way relating to construction site safety, the Work, the Project, and Site, in connection with any infectious and communicable disease in any form, whether bacterial or viral, including, without limitation, MSRA, influenza, COVID-19, and/or any similar virus or derivative strain ("**Infectious Disease(s)**"). Contractor shall ensure it has supervisor employees onsite that are trained and knowledgeable of all these requirements to ensure full compliance on Site and the Work. Contractor's obligations hereunder shall include, without limitation providing personal protective equipment ("PPE") to its employees and to ensure that its subcontractors provide PPE equipment to its employees to prevent the spread of an Infectious Disease at the Project Site(s).

6.13.22.2. **Infectious Disease and Contract Time.** Contractor agrees that the Contract Time is based on Contractor's full compliance with all applicable and existing federal, State, and/or local statutes, orders, rules, regulations, ordinances, and/or directives relating to construction site safety, the Work, the Project, and the Site in connection with an Infectious Disease. Any dispute concerning the Contract Time in connection with any delay associated with an Infectious Disease shall be resolved pursuant to the Claims procedures in these General Conditions.

6.13.22.3. **Infectious Disease Release.** Contractor acknowledges that it is voluntarily and freely entering into the Contract for this Project and deciding to perform the Work which will require Contractor to enter upon and into the Site and that Contractor use of the Site includes the possible exposure to and illness from an Infectious Disease. Contractor further acknowledges the dangers involved and with full knowledge of these dangers, voluntarily agrees to assume all risks of bodily injury, death, or property damage, whether those risks are known or unknown. Contractor hereby releases District, its agents, representatives, officers, consultants, employees, trustees, and volunteers from any and all liabilities, causes of action, lawsuits, claims, demands, or damages of any kind whatsoever that Contractor, its staff, participants, relatives, children, spouse, partner, household members, family members, employees, guests, invitees, volunteers, agents, consultants, Subcontractors, and any other person tracing exposure or illness to Contractor, now have, or may have in the future, for injury, trauma, illness, loss, unwanted contact, harassment, disability, death or property damages related to being exposed to or contracting an Infectious Disease while using the Site for the performance of the Work. Contractor shall include this paragraph in all subcontracts with Subcontractors.

6.13.22.4. Contractor shall ensure it has supervisor employees onsite that are trained and knowledgeable of all of these requirements to ensure full compliance on Project Site(s).

6.13.22.5. Any cost to comply with these "Infectious Disease Compliance Provisions" shall be at Contractor's sole expense and expense, but may be included in the Contract Price.

6.13.23. Photos, Videos and Use of Drones.

6.13.23.1. Contractor may photograph or video the progress of the Work and shall provide all of those photos and videos to the District at the District's request. Contractor may utilize drones or similar aerial equipment to photograph, video or monitor the progress of the Work and for security purposes, but Contractor must comply with all legal requirements of the federal government, the State of California, and the County and City in which the Project is located, applicable to the use of drones or similar aerial equipment. In addition, Contractor shall

ensure that no photographs, videos or digital recordings of any kind are taken of District students or staff.

6.13.23.2. If Contractor utilizes drones or any other unmanned aircraft during construction operations, Contractor must either ensure its insurance coverage includes unmanned aircraft operations or procure and maintain a separate aircraft liability policy to cover unmanned aircraft operations.

6.14. Working Evenings and Weekends

Contractor may be required to work evenings and/or weekends at no additional cost to the District. Contractor shall give the District seventy-two (72) hours' notice prior to performing any evening and/or weekend work. Contractor shall perform all evening and/or weekend work only upon District's written approval and in compliance with all applicable rules, regulations, laws, and local ordinances including, without limitation, all noise and light limitations. Contractor shall reimburse the District for any Inspector and custodial charges necessitated by the Contractor's evening and/or weekend work.

6.15. Noise and Dust Control

6.15.1. In addition to the noise control, dust control and related requirements in the Specifications, Contractor shall control the noise and dust at the Site as indicated here.

6.15.2. Noise Control. The Contractor shall install noise reducing devices on construction equipment. Contractor shall comply with the requirements of the city and county having jurisdiction with regard to noise ordinances governing construction sites and activities. Construction equipment noise at the Site shall be limited as required by applicable law, rule or regulation. If classes are in session at any point during the progress of the Work, and, in the District's reasonable discretion, the noise from any Work disrupts or disturbs the students or faculty or the normal operation of the school at the Site, at the District's request, the Contractor shall schedule the performance of that Work around normal school hours or make other arrangements so that the Work does not cause disruption or disturbance. In no event shall those arrangements result in adjustment of the Contract Price or the Contract Time.

6.15.3. Dust Control. The Contractor shall be fully and solely responsible for maintaining and upkeeping all areas of the Site and adjoining areas, outdoors and indoors, free from flying debris, grinding powder, sawdust, dirt and dust as well as any other product, product waste or work waste, that by becoming airborne may cause respiratory inconveniences to persons, particularly to students and District personnel. Additionally, the Contractor shall take specific care to avoid deposits of airborne dust or airborne elements. Those protection devices, systems or methods shall be in accordance with the regulations set forth by the EPA and OSHA, and other applicable law, rule or regulation. Additionally, the Contractor shall be responsible to regularly and routinely clean up and remove any and all deposits of dust and other elements. Damage and/or any liability derived from the Contractor's failure to comply with these requirements shall be exclusively at the cost of the Contractor, including, without limitation, any and all penalties that may be incurred for violations of applicable law, rule or regulation, and any amounts expended by the District to pay such damages shall be due and payable to the District on demand. Contractor shall replace any damages property or part thereof and professionally clean any and all items that become covered or partially covered to any degree by dust or other airborne elements. If classes are in session at any point during the progress of Work, and, in the District's reasonable discretion, flying debris, grinding powder, sawdust, dirt or dust from any Work disrupts or disturbs the students or faculty or the normal operation of the school, at the District's request, the Contractor shall schedule the performance of all that Work around normal school hours and make other arrangements so that the Work does not cause disruption or disturbance. In no event shall those arrangements result in adjustment of the Contract Price or the Contract Time.

6.15.4. Contractor Failure to Comply. If the Contractor fails to comply with the requirements for dust

control, noise control, or any other maintenance or clean up requirement of the Contract Documents, the District, Architect, Project Inspector, or Construction Manager shall notify the Contractor in writing and the Contractor shall take immediate action. Should the Contractor fail to respond with immediate and responsive action and not later than twenty-four (24) hours from that notification, the District shall have the absolute right to proceed as it may deem necessary to remedy such matter. Any and all costs incurred by the District in connection with those actions shall be the sole responsibility of, and be borne by, the Contractor; the District may deduct those amounts from the Contract Price then or thereafter due the Contractor.

6.16. Cleaning Up

6.16.1. The Contractor shall provide all services, labor, materials, and equipment necessary for protecting the Work, all school occupants, furnishings, equipment, and building structure from damage until its Completion and final acceptance by District. Dust barriers shall be provided to isolate dust and dirt from construction operations. At Completion of the Work and portions thereof, Contractor shall clean to the original state any areas beyond the Work area that become dust laden as a result of the Work. The Contractor must erect the necessary warning signs and barricades to ensure the safety of all school occupants. The Contractor at all times must maintain good housekeeping practices to reduce the risk of fire damage and must make a fire extinguisher, fire blanket, and/or fire watch, as applicable, available at each location where cutting, braising, soldering, and/or welding is being performed or where there is an increased risk of fire.

6.16.2. Contractor at all times shall keep Premises free from debris such as waste, rubbish, and excess materials and equipment caused by the Work. Contractor shall not leave debris under, in, or about the Premises, but shall promptly remove same from the Premises on a daily basis. If Contractor fails to clean up, District may do so and the cost thereof shall be charged to Contractor. If Contract is for work on an existing facility, Contractor shall also perform specific clean-up on or about the Premises upon request by the District as it deems necessary for the continuing education process. Contractor shall comply with all related provisions of the Specifications.

6.16.3. If the Construction Manager, Architect, or District observes the accumulation of trash and debris, the District will give the Contractor a 24-hour written notice to mitigate the condition.

6.16.4. Should the Contractor fail to perform the required clean-up, or should the clean-up be deemed unsatisfactory by the District, the District will then perform the clean-up. All cost associated with the clean-up work (including all travel, payroll burden, and costs for supervision) will be deducted from the Contract Price, or District may withhold those amounts from payment(s) to Contractor.

7. SUBCONTRACTORS

7.1. Contractor shall provide the District with information for all Subcontracts as required in the Contractor's Submittals and Schedules Section.

7.2. No contractual relationship exists between the District and any Subcontractor, supplier, or sub-subcontractor by reason of the Contract.

7.3. Contractor agrees to bind every Subcontractor by terms of the Contract as far as those terms are applicable to Subcontractor's work. If Contractor shall subcontract any part of the Contract, Contractor shall be as fully responsible to District for acts and omissions of any Subcontractor and of persons either directly or indirectly employed by any Subcontractor, as it is for acts and omissions of persons directly employed by Contractor. The divisions or sections of the Specifications are not intended to control the Contractor in dividing the Work among Subcontractors or limit the work performed by any trade.

7.4. District's consent to, or approval of, or failure to object to, any Subcontractor under the Contract shall not

in any way relieve Contractor of any obligations under the Contract and no such consent shall be deemed to waive any provisions of the Contract.

7.5. Contractor acknowledges sections 4100 through 4114 of the Public Contract Code of the State of California, as regards subletting and subcontracting, and shall comply with all applicable requirements therein. In addition, Contractor acknowledges sections 1720 through 1861 of the Labor Code of the State of California, as regards the payment of prevailing wages and related issues, and shall comply with all applicable requirements therein all including, without limitation, section 1775 and the Contractor's and Subcontractors' obligations and liability for violations of prevailing wage law and other applicable laws.

7.6. No Contractor whose Bid is accepted shall, without consent of the awarding authority and in full compliance with section 4100, et seq, of the Public Contract Code, including, without limitation, sections 4107, 4107.5, and 4109 of the Public Contract Code, either:

7.6.1. Substitute any person as a Subcontractor in place of the Subcontractor designated in the original Bid; or

7.6.2. Permit any Subcontract to be assigned or transferred, or allow any portion of the Work to be performed by anyone other than the original Subcontractor listed in the Bid; or

7.6.3. Sublet or subcontract any portion of the Work in excess of one-half of one percent (1/2 of 1%) of the Contractor's total bid as to which his original bid did not designate a Subcontractor.

7.7. The Contractor shall be responsible for the coordination of the trades, Subcontractors, sub-subcontractors, and material or equipment suppliers working on the Project.

7.8. Contractor is solely responsible for settling any differences between the Contractor and its Subcontractor(s) or between Subcontractors.

7.9. Contractor must include in all of its subcontracts the assignment provisions as indicated in the Termination section of these General Conditions.

8. OTHER CONTRACTS/CONTRACTORS

8.1. District reserves the right to let other contracts, and/or to perform work with its own forces, in connection with other portions of the Project or other construction or operations at or about the Site. Contractor shall afford other contractors reasonable opportunity for introduction and storage of their materials and execution of their work and shall properly coordinate and connect Contractor's Work with the work of other contractors.

8.2. In addition to Contractor's obligation to protect its own Work, Contractor shall protect the work of any other contractor that Contractor encounters while working on the Site.

8.3. If any part of Contractor's Work depends for proper execution or results upon work of District or any other contractor, Contractor shall inspect and promptly report to the District in writing before proceeding with its Work any defects in District's or any other contractor's work that render Contractor's Work unsuitable for proper execution and results. Contractor shall be held accountable for damages to District for District's or any other contractor's work that Contractor failed to inspect or should have inspected. Contractor's failure to inspect and report shall constitute Contractor's acceptance of all District's or any other contractor's work as fit and proper for reception of Contractor's Work, except as to defects that may develop in District's or any other contractor's work after execution of Contractor's Work.

8.4. To ensure proper execution of its subsequent work, Contractor shall measure and inspect work already in place and shall at once report to the District in writing any discrepancy between that executed work and

the Contract Documents.

8.5. Contractor shall ascertain to its own satisfaction the scope of the Project and nature of District's or any other contracts that have been or may be awarded by District in completion of the Project to the end that Contractor may perform this Contract in light of the other contracts, if any.

8.6. Nothing herein contained shall be interpreted as granting to Contractor exclusive occupancy of the Site, the Premises, or of the Project. The District shall have complete access to the Project Site for any reasonable purpose at all times. Contractor shall not cause any unnecessary hindrance or delay to the use and/or school operation(s) of the Premises and/or to District or any other contractor working on the Project. If simultaneous execution of any contract or school operation is likely to cause interference with performance of Contractor's Contract, Contractor shall coordinate with those contractor(s), person(s), and/or entity(s) and shall notify the District of the resolution.

9. DRAWINGS AND SPECIFICATIONS

9.1. A complete list of all Drawings that form a part of the Contract is to be found as an index on the Drawings themselves, and/or may be provided to the Contractor and/or in the Table of Contents.

9.2. Materials or Work described in words that so applied have a well-known technical or trade meaning shall be deemed to refer to recognized standards, unless noted otherwise.

9.3. Trade Name or Trade Term. It is not the intention of the Contract to go into detailed descriptions of any materials and/or methods commonly known to the trade under "trade name" or "trade term." The mere mention or notation of "trade name" or "trade term" shall be considered sufficient notice to Contractor that it will be required to complete the work so named, complete, finished, and operable, with all its appurtenances, according to the best practices of the trade.

9.4. The naming of any material and/or equipment shall mean furnishing and installing of same, including all incidental and accessory items thereto and/or labor therefor, as per best practices of the trade(s) involved, unless specifically noted otherwise.

9.5. Contract Documents are complementary, and what is called for by one shall be binding as if called for by all. As such, Drawings and Specifications are intended to be fully cooperative and to agree. However, if Contractor observes that Drawings and Specifications are in conflict, Contractor shall promptly notify District and Architect in writing, and any necessary changes shall be made as provided in the Contract Documents.

9.6. In the case of discrepancy or ambiguity in the Contract Documents, the order of precedence in the Agreement shall prevail. However, in the case of discrepancy or ambiguity solely between and among the Drawings and Specifications, the discrepancy or ambiguity shall be resolved in favor of the interpretation that will provide District with the functionally complete and operable Project described in the Drawings and Specifications. In case of ambiguity, conflict, or lack of information, District will furnish clarifications with reasonable promptness.

9.7. Drawings and Specifications are intended to comply with all laws, ordinances, rules, and regulations of constituted authorities having jurisdiction, and where referred to in the Contract Documents, the laws, ordinances, rules, and regulations shall be considered as a part of the Contract within the limits specified. Contractor shall bear all expense of correcting work done contrary to said laws, ordinances, rules, and regulations.

9.8. Ownership of Drawings

9.8.1. All copies of the Drawings, Designs, Specifications, and copies of other incidental architectural

and engineering work, or copies of other Contract Documents furnished by District, are the property of District. They are not to be used by Contractor in other work and, with the exception of signed sets of Contract Documents, are to be returned to District on request at Completion of Work, or may be used by District as it may require without any additional costs to District. Neither the Contractor nor any Subcontractor, or material or equipment supplier shall own or claim a copyright in the Drawings, Specifications, and other documents prepared by the Architect. District hereby grants the Contractor, Subcontractors, sub-subcontractors, and material or equipment suppliers a limited license to use applicable portions of the Drawings prepared for the Project in the execution of their Work under the Contract Documents.

10. CONTRACTOR'S SUBMITTALS AND SCHEDULES

Contractor's submittals shall comply with the provisions and requirements of the Specifications including, without limitation Submittals. No submittal, unless approved in writing by the District as acceptable and complete, shall be a Contract Document.

10.1. Schedules, Safety Plan and Complete Subcontractor List

10.1.1. Within **TEN (10)** calendar days after the date of the Notice to Proceed (unless otherwise specified in the Notice to Proceed or in the Special Conditions), Contractor shall prepare and submit to the District for review, in a form supported by sufficient data to substantiate its accuracy as the District may require:

10.1.1.1. Schedule of Work. Contractor shall provide a preliminary schedule of construction indicating the starting and completion dates of the various stages of the Work, including any information and following any form as may be specified in the Specifications. Once approved by District, this shall become the Construction Schedule. This schedule shall include and identify all tasks that are on the Project's critical path with a specific determination of the start and completion of each critical path task, all contract milestones and each milestone's completion date(s) as may be required by the District, and the date of Project Completion.

10.1.1.1.1. Proposed Advanced Schedule. The District is not required to accept an early completion ("advanced") schedule; i.e., one that shows early completion dates for the Contract completion or milestones. Contractor shall not be entitled to extra compensation if the District allows the Contractor to proceed performing the Contract on an earlier ("advanced") schedule and Contractor completes the Project, for whatever reason, beyond the date shown in that earlier ("advanced") schedule, but within the Time for Completion indicated in the Contract. A schedule showing the work completed in less than the Time for Completion indicated in the Contract, shall be considered to have Project Float.

10.1.1.1.2. Float or Slack in the Schedule. Float or slack is the amount of time between the early start date and the late start date, or the early finish date and the late finish date, of any of the activities in the schedule. Float or slack is not for the exclusive use of or benefit of either the District or the Contractor, but its use shall be determined solely by the District.

10.1.1.2. Schedule of Submittals. The Contractor shall provide a preliminary schedule of submittals, including Shop Drawings, Product Data, and Samples submittals. Once approved by District, this shall become the Submittal Schedule. All submittals shall be forwarded to the District by the date indicated on the approved Submittal Schedule, unless an earlier date is necessary to maintain the Construction Schedule, in which case those submittals shall be forwarded to the District so as not to delay the Construction Schedule.

10.1.1.3. Schedule of Values. The Contractor shall provide a preliminary schedule of values for all component parts of the Work for which progress payments may be requested. The schedule of values must include quantities and prices of items totaling the Contract Price and

must subdivide the Work into component parts in sufficient detail to serve as the basis for progress payments during construction. The preliminary schedule of values should include, at a minimum, the following information and the following structure:

10.1.1.3.1. Divided into at least the following categories:

10.1.1.3.1.1. Mobilization;
10.1.1.3.1.2. Supervision;
10.1.1.3.1.3. General conditions;
10.1.1.3.1.4. Insurance;
10.1.1.3.1.5. Bond;
10.1.1.3.1.6. Submittals;
10.1.1.3.1.7. Demobilization;
10.1.1.3.1.8. Closeouts;
10.1.1.3.1.9. Punchlist;
10.1.1.3.1.10. Allowance.

10.1.1.3.2. Divided by each of the following areas:

10.1.1.3.2.1. Site work;
10.1.1.3.2.2. By material and labor;
10.1.1.3.2.3. By each building;
10.1.1.3.2.4. By each floor.

10.1.1.3.3. The preliminary schedule of values shall not provide for values any greater than the following percentages of the Contract value:

10.1.1.3.3.1. Mobilization and layout combined to equal not more than 1%;
10.1.1.3.3.2. Submittals, samples and shop drawings combined to equal not more than 3%,
10.1.1.3.3.3. Bonds and insurance combined to equal not more than 2%.

10.1.1.3.4. Closeout Documentation. Closeout Documentation shall have a value in the preliminary schedule of not less than 5%. The value for Closeout Documentation shall be in addition to and shall not be a part of the Contract retention.

10.1.1.3.5. All items on the Schedule of Values must have a specific completion date on the Construction Schedule, or District has approved the Construction Schedule and the Construction Schedule is fully cost-loaded and resource-loaded, unless waived by the District in writing, and detailed as required by the Contract Documents

10.1.1.3.6. Contractor shall certify that the preliminary schedule of values as submitted to the District is accurate and reflects the costs as developed in preparing Contractor's bid. The preliminary schedule of values shall be subject to the District's review and approval of the form and content thereof. In the event that the District objects to any portion of the preliminary schedule of values, the District shall notify the Contractor, in writing, of the District's objection(s) to the preliminary schedule of values. Within five (5) calendar days of the date of the District's written objection(s), Contractor shall submit a revised preliminary schedule of values to the District for review and approval. The foregoing procedure for the preparation, review and approval of the preliminary schedule of values shall continue until the District has approved the entirety of the preliminary schedule of values.

10.1.1.3.7. Once the preliminary schedule of values is approved by the District, this shall become the Schedule of Values. The Schedule of Values shall not be thereafter modified or

amended by the Contractor without the prior written consent and approval of the District, which may be granted or withheld in the sole discretion of the District.

10.1.1.3.8. Notwithstanding any provision of the Contract Documents to the contrary, payment of the Contractor's overhead, supervision, general conditions costs, and profit, as reflected in the Schedule of Values, shall be paid by the District in installments, based on percentage complete, with the disbursement of Progress Payments and the Final Payment.

10.1.1.3.9. The Contractor shall not "front-load" the Schedule of Values with false dollar amounts for activities to be performed in the early stages of the Project. The District may, in its sole discretion, utilize the costs listed in the Schedule of Values as the true cost of items to be deducted from the Contract Price through credit or deductive Change Order. The values for each line item shall include the amount of overhead and profit applicable to each item of work and shall include, at a minimum, a breakdown between rough and finish Work for the basic trades as well as individual dollar figures for large dollar equipment and materials to be installed or furnished for the Project. No individual line item or scope of work in the Schedule of Values shall exceed $50,000, except with the express, written consent of the District. Exceptions will be given by the District for a single item of Equipment for which the true cost exceeds $50,000. The Schedule of Values shall be subject to the District's review and approval of the form and content thereof. Upon request, Contractor shall provide District with data and documentation substantiating the accuracy of the proposed line items. In the event that the District shall reasonably object to any portion of the Schedule of Values, within ten (10) days of the District's receipt of the Schedule of Values, the District shall notify the Contractor, in writing of the District's objection(s) to the Schedule of Values together with any request for substantiating data or documentation. Within five (5) days of the date of the District's written objection(s) and request for substantiating data and documentation, Contractor shall submit a revised Schedule of Values to the District for review and approval together with the requested data and documentation. The foregoing procedure for the preparation, review and approval of the Schedule of Values shall continue until the District has approved of the entirety of the Schedule of Values. Once the Schedule of Values is approved by the District, the Schedule of Values shall not be thereafter modified or amended by the Contractor without the prior consent and approval of the District, which may be granted or withheld in the sole reasonable discretion of the District. Notwithstanding any provision of the Contract Documents to the contrary, payment of the Contractor's overhead, supervision and general conditions costs and profit, as such items are reflected in the Schedule of Values, shall be made incrementally as included in the activities included in the Approved Construction Schedule.

10.1.1.4. **Safety Plan.** The Contractor shall provide a preliminary Contractor's Safety Plan specifically adapted for the Project. Contractor's Safety Plan shall comply with the following requirements:

10.1.1.4.1. Shall include all applicable requirements of California Division of Industrial Safety ("CalOSHA") and/or of the United States Occupational Safety and Health Administration ("OSHA").

10.1.1.4.2. Shall include all provisions regarding Project safety, including all applicable provisions in these General Conditions.

10.1.1.4.3. Shall be prepared in both English and in the predominant language(s) of the Contractor's and its Subcontractors' employees.

10.1.1.4.4. Shall include a Fire Safety Plan, pursuant to Section 3303.1 of Chapter 33 of the California Fire Code, as indicated in these General Conditions and the Instructions to Bidders.

10.1.1.5. **Complete Subcontractor List.** Contractor shall provide a preliminary Subcontractor List stating the name, address, telephone number, facsimile number, email address, California State Contractors License number, Department of Industrial Relations registration number, classification, and monetary value of all Subcontracts for parties furnishing labor, material, or equipment for the Project.

10.1.2. Contractor must provide all schedules both in hard copy and electronically, in a format (e.g., Microsoft Project, Primavera, or substantially similar product) approved in advance by the District.

10.1.3. The District will review the schedules submitted and the Contractor shall make changes and corrections in the schedules as requested by the District and resubmit the schedules until approved by the District.

10.1.4. The District shall have the right at any time to revise the Schedule of Values if, in the District's sole opinion, the Schedule of Values does not accurately reflect the value of the Work performed.

10.1.5. All submittals and schedules must be approved by the District before Contractor can rely on them as a basis for payment.

10.2. **Monthly Progress Schedule(s)**

10.2.1. Contractor shall provide Monthly Progress Schedule(s) to the District. A Monthly Progress Schedule shall update the approved Construction Schedule or the last Monthly Progress Schedule, showing all work completed and to be completed. The Monthly Progress Schedule shall be sent to the District and shall be in a format acceptable to the District and contain a written narrative of the progress of work that month and any changes, delays, or events that may affect the work. The process for District approval of the Monthly Progress Schedule shall be the same as the process for approval of the Construction Schedule.

10.2.2. Contractor shall also submit Monthly Progress Schedule(s) with all payment applications.

10.3. **Material Safety Data Sheets (MSDS)**

Contractor is required to ensure Material Safety Data Sheets are available in a readily accessible place at the Work Site for any material requiring a Material Safety Data Sheet per the Federal "Hazard Communication" standard, or employees right to know law. The Contractor is also required to ensure proper labeling on substances brought onto the Project Site and that any person working with the material or within the general area of the material is informed of the hazards of the substance and follows proper handling and protection procedures. Two additional copies of the Material Safety Data Sheets shall also be submitted directly to the District.

10.4. **Logistic Plan**

Contractor shall provide a staging and logistics plan identifying laydown areas, loading and unloading areas, crane locations, fence locations, temporary utility connections, trailer locations, and emergency evacuation meeting area. This Logistics Plan must be approved by the District prior to the Contractor mobilizing on the Site.

10.5. **Information Included in Submittals.**

All Submittals shall be accompanied by a written transmittal and each set of plans shall carry a "wet stamp" or other writing by the Contractor providing an identification of the portion of the Drawings or the Specifications pertaining to the Submittal, with each Submittal numbered consecutively for ease of reference along with the following information: (i) date of submission; (ii) Project name; (iii) name of

submitting Subcontractor; and (iv) if applicable, the revision number. The foregoing information is in addition to, and not in lieu of, any other information required for the District's review, evaluation and approval of the Contractor's Submittals. Each Submittal shall be complete with its required number of copies, no piecemeal documentation is allowed. Any Submittal not bearing the required wet stamp as stated herein, shall be rejected until the appropriate wet stamp information is provided on each submittal.

10.6. Verification of Submittal Information.

By approving and submission of Submittals, the Contractor represents to the District and Architect that the Contractor has determined and verified materials, field measurements, field construction criteria, catalog numbers and similar data related thereto and has checked and coordinated the information contained within such Submittals with the requirements of the Work and of the Contract Documents. Each Submittal shall include the following certification duly executed by the Contractor's superintendent or project manager for the Work: "The Contractor has reviewed and approved the field dimensions and construction criteria of the attached Submittal. The Contractor has verified that the Submittal is complete and includes notations of any portion of the Work depicted in the Submittal which is not in strict conformity with the Contract Documents. The information in the attached Submittal has been reviewed and coordinated by the Contractor with information included in other Submittals."

10.7. Contractor Responsibility for Deviations.

The Contractor shall not be relieved of responsibility for correcting deviations from the requirements of the Contract Documents by the District's and Architect's review of Submittals unless the Contractor has specifically informed the District in writing of such deviation at the time of submission of the Submittal and the District has given written approval to the specific deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Submittals by the District's and Architect's review or comments thereon.

10.8. No Performance of Work Without Architect Review.

The Contractor shall perform no portion of the Work requiring the District's and Architect's review of Submittals until the District and Architect have completed their review and returned the Submittal to the Contractor indicating "No Exception Taken" to that Submittal. The Contractor shall not perform any portion of the Work forming a part of a Submittal or which is affected by a related Submittal until the entirety of the Submittal or other related Submittal has been fully processed. All Work shall be in accordance with the final action taken by the District and the Architect review in review of Submittals and other applicable portions of the Contract Documents.

10.9. District and Architect Review of Submittals.

The purpose of the District's and Architect's review of Submittals and the time for the District's and Architect's return of Submittals to the Contractor shall be as set forth elsewhere in the Contract Documents. If the District and/or Architect return a Submittal as rejected or requiring correction(s) with re-submission, the Contractor, so as not to delay the progress of the Work, shall promptly thereafter resubmit a Submittal conforming to the requirements of the Contract Documents; the resubmitted Submittal shall indicate the portions thereof modified in accordance with the District's and Architect's direction. When professional certification of performance criteria of materials, systems or equipment is required by the Contract Documents, the District shall be entitled to rely upon the accuracy and completeness of the Contractor's calculations and certifications accompanying Submittals. The District's and Architect's review of the Submittals is for the limited purposes described in the Contract Documents. The District and Architect will review each Submittal twice. Should additional Submittals be required as a result of failure of the Contractor to address comments, the Contractor will pay for the Architect's services on a time and material basis for each subsequent review.

10.10. Deferred Approval Items.

In the event that any portion of the Work is designated in the Contract Documents as a "Deferred Approval" item from DSA, Contractor shall be solely and exclusively responsible for the preparation of Submittals for such item(s) in a timely manner so as not to delay or hinder the completion of the Work within the Contract Time. All work, labor, materials, equipment or services necessary to complete the design, engineering and permitting/approval of the Deferred Approval items shall be provided by the Contractor without adjustment of the Contract Price or the Contract Time.

10.11. Contractor Responsibility for Deviations

The Contractor shall not be relieved of responsibility for correcting deviations from the requirements of the Contract Documents by the District's or Architect's review of Submittals unless the Contractor has specifically informed the District and the Architect in writing of such deviation at the time of submission of the Submittal and the District and the Architect have given written approval to the specific deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Submittals by the District's or the Architect's review or comments thereon.

11. SITE ACCESS, CONDITIONS AND REQUIREMENTS

11.1. Site Investigation

Before bidding on the Work, Contractor shall make a careful investigation of the Site and thoroughly familiarize itself with the requirements of the Contract. By the act of submitting a bid for the Work included in the Contract, Contractor shall be deemed to have made a complete study and investigation, and to be familiar with and accepted the existing conditions of the Site.

11.2. Soils Investigation Report

11.2.1. When a soils investigation report obtained from test holes at Site is available, that report shall be available to the Contractor but shall not be a part of the Contract. Any information obtained from that report or any information given on Drawings as to subsurface soil condition or to elevations of existing grades or elevations of underlying rock is approximate only, is not guaranteed, does not form a part of the Contract, and Contractor may not rely thereon. By submitting its bid, Contractor acknowledges that it made visual examination of Site and made whatever tests Contractor deems appropriate to determine underground condition of soil.

11.2.2. If a soils report is identified in the Contract Documents, it is not a Contract Document. Further, no representation is made by District that information provided is adequate for purposes of construction of the Project. District disclaims responsibility for any and all interpretations made by the Contractor of any soil or subsurface condition for information, such as soil-bearing values, rock profiles, presence and scope of boulders and cobbles, soil stability and the presence or level and extent of underground water.

11.2.3. The Contractor shall determine the means, methods, techniques and sequences necessary to achieve required soil contours and characteristics of all completed Work.

11.2.4. If after execution of the Contract, the Contractor encounters conditions at the Site than are materially different from those customarily encountered at or near the Premises, any request by the Contractor for additional funds or additional time, shall be governed by provisions of the Contract Documents for Changes in the Work related to unforeseen conditions.

11.2.5. Contractor agrees that no claim against District will be made by Contractor for damages and hereby waives any rights to damages if, during progress of Work, Contractor encounters subsurface or latent conditions at Site materially differing from those shown on Drawings or indicated in Specifications,

or for unknown conditions of an unusual nature that differ materially from those ordinarily encountered in the work of the character provided for in Plans and Specifications, except as indicated in the provisions of these General Conditions regarding trenches, trenching, and/or existing utility lines.

11.3. Access to Work

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

11.4. Layout and Field Engineering

11.4.1. All field engineering required for layout of this Work and establishing grades for earthwork operations shall be furnished by Contractor at its expense. This Work shall be done by a qualified, California-registered civil engineer approved in writing by District and Architect. Any required Record and/or As-Built Drawings of Site development shall be prepared by the approved civil engineer.

11.4.2. Contractor shall be responsible for having ascertained pertinent local conditions such as location, accessibility, and general character of the Site and for having satisfied itself as to the conditions under which the Work is to be performed. District shall not be liable for any claim for allowances because of Contractor's error or negligence in acquainting itself with the conditions at the Site.

11.4.3. Contractor shall protect and preserve established benchmarks and monuments and shall make no changes in locations without the prior written approval of District. Contractor shall replace any benchmarks or monuments that are lost or destroyed subsequent to proper notification of District and with District's approval.

11.5. Utilities for Construction

Utilities necessary to complete the Work and to completely perform all of the Contractors' obligations shall be obtained by the Contractor without adjustment of the Contract Price. The Contractor shall furnish and install necessary or appropriate temporary distributions of utilities, including utilities furnished by the District. Any such temporary distributions shall be removed by the Contractor upon completion of the Work. The costs of all such utility services, including the installation and removal of temporary distributions thereof, shall be borne by the Contractor and included in the Contract Price. Also refer to other utility requirements as indicated in the Specifications.

11.6. Sanitary Facilities

At all times during Work at the Site, the Contractor shall obtain and maintain temporary sanitary facilities in conformity with applicable law, rule or regulation. The Contractor shall maintain temporary sanitary facilities in a neat and clean manner with sufficient toilet room supplies. Personnel engaged in the Work are not permitted to use toilet facilities at the Site. Also refer to other Sanitary facility requirements as indicated in the Specifications.

11.7. Surveys

Contractor shall provide surveys done by a California-licensed civil engineer surveyor to determine locations of construction, grading, and site work as required to perform the Work.

11.8. Regional Notification Center

Contractor, except in an emergency, shall contact the appropriate regional notification center at least two (2) days prior to commencing any excavation if the excavation will be conducted in an area or in a private easement that is known, or reasonably should be known, to contain subsurface installations other than

the underground facilities owned or operated by the District, and obtain an inquiry identification number from that notification center. No excavation shall be commenced and/or carried out by the Contractor unless an inquiry identification number has been assigned to the Contractor or any Subcontractor and the Contractor has given the District the identification number. Any damages arising from Contractor's failure to make appropriate notification shall be at the sole risk and expense of the Contractor. Any delays caused by failure to make appropriate notification shall be at the sole risk of the Contractor and shall not be considered for an extension of the Contract time.

11.9. Existing Utility Lines

11.9.1. Pursuant to Government Code section 4215, District assumes the responsibility for removal, relocation, and protection of main or trunk utility lines and facilities located on the construction Site at the time of commencement of construction under the Contract with respect to any such utility facilities that are not identified in the Plans and Specifications. Contractor shall not be assessed for liquidated damages for delay in completion of the Project caused by failure of District or the owner of a utility to provide for removal or relocation of such utility facilities.

11.9.2. Locations of existing utilities provided by District shall not be considered exact, but approximate within reasonable margin and shall not relieve Contractor of responsibilities to exercise reasonable care nor costs of repair due to Contractor's failure to do so. District shall compensate Contractor for the costs of locating, repairing damage not due to the failure of Contractor to exercise reasonable care, and removing or relocating such utility facilities not indicated in the Plans and Specifications with reasonable accuracy, and for equipment necessarily idle during such work.

11.9.3. No provision herein shall be construed to preclude assessment against Contractor for any other delays in completion of the Work. Nothing in this Article shall be deemed to require District to indicate the presence of existing service laterals, appurtenances, or other utility lines, within the exception of main or trunk utility lines, whenever the presence of these utilities on the Site can be inferred from the presence of other visible facilities, such as buildings, meter junction boxes, on or adjacent to the Site.

11.9.4. If Contractor, while performing Work, discovers utility facilities not identified by District in Contract Plans and Specifications, Contractor shall immediately, but in no case longer than two (2) Business Days, notify the District and the utility in writing. The cost of repair for damage to above-mentioned visible facilities without prior written notification to the District shall be borne by the Contractor.

11.10. Notification

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

11.11. Hazardous Materials

Contractor shall comply with all provisions and requirements of the Contract Documents related to hazardous materials including, without limitation, certifications related to hazardous materials in the document entitled Certifications to be Completed by Contractor.

11.12. No Signs

Neither the Contractor nor any other person or entity shall display any signs not required by law or the

Contract Documents at the Site, fences trailers, offices, or elsewhere on the Site without specific prior written approval of the District.

12. TRENCHES

12.1. Trenches Greater Than Five Feet

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

12.2. Excavation Safety

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

12.3. No Tort Liability of District

Pursuant to Labor Code section 6705, nothing in this Article shall impose tort liability upon the District or any of its employees.

12.4. 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.

12.5. Discovery of Hazardous Waste, Unusual Conditions and/or Unforeseen Conditions

12.5.1. Pursuant to Public Contract Code section 7104, if the Work involves digging trenches or other excavations that extend deeper than four (4) feet below the surface, the Contractor shall immediately, but in no case longer than two (2) Business Days, and before the following conditions are disturbed, notify the District, in writing, of any:

12.5.1.1. Material that the Contractor believes may be material that is hazardous waste, as defined in section 25117 of the Health and Safety Code, and requires removal to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law.

12.5.1.2. Subsurface or latent physical conditions at the Site differing from those indicated.

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

12.5.2. The District 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 herein.

12.5.3. In the event that a dispute arises between District 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 scheduled Completion date provided for by the Contract, but shall proceed with all work to be performed under the Contract. The Contractor shall retain any and all rights provided by the Contract or by law that pertain to the resolution of disputes and protests, which include the requirement that Contractor complies with the notice and PCO provisions of the Contract Documents. Contractor's failure to submit a proposed change order pursuant to the terms of the Contract Documents shall be deemed a waiver of Contractor's right to an adjustment of the Contract Price of Contract Time.

13. INSURANCE AND BONDS

13.1. Insurance

Unless different provisions and/or limits are indicated in the Special Conditions, all insurance required of Contractor and/or its Subcontractor(s) shall be in the amounts indicated herein and include the provisions set forth herein.

13.1.1. Commercial General Liability and Automobile Liability Insurance

13.1.1.1. Contractor shall procure and maintain, during the life of the Contract, Commercial General Liability Insurance and Automobile Liability Insurance that shall protect Contractor, District, State, Construction Manager(s), Project Inspector(s), and Architect(s) from all claims for bodily injury, property damage, personal injury, death, advertising injury, and medical payments arising from operations under the Contract. This coverage shall be provided in a form at least as broad as the Insurance Services Office (ISO) standard form. Contractor shall ensure that Products Liability and Completed Operations coverage, Fire Damage Liability, and any Auto including owned, non-owned, and hired, are included within the above policies and at the required limits, or Contractor shall procure and maintain these coverages separately.

13.1.1.2. Contractor's deductible or self-insured retention for its Commercial General Liability Insurance policy shall not exceed $25,000 unless approved in writing by District.

13.1.2. Umbrella Liability Insurance

13.1.2.1. Contractor shall procure and maintain, during the life of the Contract, an Excess Liability and/or Umbrella Liability Insurance Policy. Any Umbrella Liability Insurance Policy shall protect Contractor, District, State, Construction Manager(s), Program Manager(s), and Architect(s) in the amounts indicated herein, and shall comply with all requirements for Commercial General Liability and Automobile Liability, Employers' Liability Insurance, and Sexual Abuse and Molestation Liability. This coverage shall be provided in a form at least as broad as the Insurance Services Office (ISO) standard form.

13.1.2.2. There shall be no gap between the per occurrence amount of any underlying policy and the start of the coverage under the Umbrella Liability Insurance Policy.

13.1.2.3. Whether this Excess Liability and/or Umbrella Liability Insurance Policy is written on a "follow form" or "stand alone" form, the coverages shall equal or greater than the Contractor's Commercial General Liability and Automobile Liability, Employers' Liability Insurance, and Sexual Abuse and Molestation Liability with no exclusions that reduce or eliminate coverage items.

13.1.3. Subcontractor(s): Contractor shall require its Subcontractor(s), if any, to procure and maintain Commercial General Liability Insurance, Automobile Liability Insurance, and Umbrella Liability Insurance

with minimum limits equal to at least fifty percent (50%) of the amounts required of the Contractor.

13.1.4. Workers' Compensation and Employers' Liability Insurance

13.1.4.1. In accordance with provisions of section 3700 of the California Labor Code, the Contractor and every Subcontractor shall be required to secure the payment of compensation to its employees.

13.1.4.2. Contractor shall procure and maintain, during the life of this Contract, Workers' Compensation Insurance and Employers' Liability Insurance for all of its employees engaged in Work under the Contract, on/or at the Site of the Project. This coverage shall cover, at a minimum, medical and surgical treatment, disability benefits, rehabilitation therapy, and survivors' death benefits. Contractor shall require its Subcontractor(s), if any, to procure and maintain Workers' Compensation Insurance and Employers' Liability Insurance for all employees of Subcontractor(s). Any class of employee or employees not covered by a Subcontractor's insurance shall be covered by Contractor's insurance. If any class of employee or employees engaged in Work under the Contract, on or at the Site of the Project, are not protected under the Workers' Compensation Insurance, Contractor shall provide, or shall cause a Subcontractor to provide, adequate insurance coverage for the protection of any employee(s) not otherwise protected before any of those employee(s) commence work.

13.1.5. Sexual Abuse and Molestation Liability Insurance. Contractor shall procure and maintain, during the life of this Contract, Sexual Abuse and Molestation insurance. Contractor shall require its Subcontractor(s), if any, to procure and maintain Sexual Abuse and Molestation insurance for all employees of Subcontractor(s). Any class of employee or employees not covered by a Subcontractor's insurance shall be covered by Contractor's insurance. If any class of employee or employees engaged in Work under the Contract, on or at the Site of the Project, are not covered under the Sexual Abuse and Molestation insurance, Contractor shall provide, or shall cause a Subcontractor to provide, adequate insurance coverage to cover any employee(s) not otherwise covered before any of those employee(s) commence work.

13.1.6. Builder's Risk Insurance: Builder's Risk "All Risk" Insurance (NO Earthquake or Flood).

13.1.6.1. Contractor (Builder) shall procure and maintain, during the life of this Contract, Builder's Risk (Course of Construction), or similar first party property coverage acceptable to the District, issued on a replacement cost value basis. The cost shall be consistent with the total replacement cost of all insurable Work included within the Contract Documents.

13.1.6.2. Coverage is to insure against all risks of accidental physical loss and shall include without limitation the perils of vandalism and/or malicious mischief (both without any limitation regarding vacancy or occupancy), sprinkler leakage, water damage, mold, civil authority, theft, sonic disturbance, collapse, wind, fire, war, terrorism, lightning, smoke, and rioting. Coverage shall include debris removal, demolition, increased costs due to enforcement of all applicable ordinances and/or laws in the repair and replacement of damaged and undamaged portions of the property, and reasonable costs for the Architect's and engineering services and expenses required as a result of any insured loss upon the Work and Project, including completed Work and Work in progress, to the full insurable value thereof.

13.1.6.3. Coverage shall be maintained until final payment has been made as provided under the Contract or until no person or entity other than the District has an insurable interest in the property to be covered, whichever is later. This insurance shall cover as insureds the District, Contractor, all Subcontractors of every tier on the Project, and all vendors and suppliers. Coverage must also be maintained for any materials stored offsite that will be incorporated into the Project.

13.1.6.4. The deductible for this insurance shall be paid by Contractor.

13.1.6.5. **Contractor must review the Special Conditions to confirm the scope of this requirement and if the District has modified this provision**.

13.1.7. **Proof of Carriage of Insurance and Other Requirements: Endorsements and Certificates**

13.1.7.1. Contractor shall not commence Work nor shall it allow any Subcontractor to commence Work under the Contract, until Contractor and its Subcontractor(s) have procured all required insurance and Contractor has delivered in duplicate to the District complete endorsements (or entire insurance policies) and certificates indicating the required coverages have been obtained, and the District has approved these documents.

13.1.7.2. Endorsements, certificates, and insurance policies shall include the following:

13.1.7.2.1. A clause stating:

13.1.7.2.1.1. "This policy shall not be amended, canceled or modified and the coverage amounts shall not be reduced until notice has been mailed to District, Architect, and Construction Manager stating date of amendment, modification, cancellation or reduction. Date of amendment, modification, cancellation or reduction may not be less than thirty (30) days after date of mailing notice."

13.1.7.2.1.2. In lieu of receiving an endorsement with this clause, the District may, at its sole discretion, accept written notification from Contractor and its insurer to the District of any amendments, modifications, cancellations or reduction in coverage, not less than thirty (30) days prior to such coverage changes occur.

13.1.7.2.2. Language stating in particular those insured, extent of insurance, location and operation to which insurance applies, expiration date, to whom cancellation and reduction notice will be sent, and length of notice period.

13.1.7.3. **Additional Insured.** All endorsements, certificates and insurance policies shall state that District, its trustees, employees and agents, the State of California, Construction Manager(s), Program Manager(s), Inspector(s) and Architect(s) are named additional insureds under all policies except Workers' Compensation Insurance and Employers' Liability Insurance.

13.1.7.3.1. No additional insured endorsement, either from Contractor or any subcontractor, shall include a requirement for privity of contract as a condition of additional insured coverage.

13.1.7.4. Contractor's and Subcontractors' insurance policy(s) shall be primary and non-contributory to any insurance or self-insurance maintained by District, its trustees, employees and/or agents, the State of California, Construction Manager(s), Program Manager(s), Inspector(s), and/or Architect(s).

13.1.7.5. All endorsements shall waive any right to subrogation against any of the named additional insureds.

13.1.7.6. All policies shall be written on an occurrence form.

13.1.7.7. Unless otherwise stated in the Special Conditions, all of Contractor's insurance shall be placed with insurers **ADMITTED** in California with a current A.M. Best's rating of no less than **A—** or **A:VII.**

13.1.7.8. The insurance requirements set forth herein shall in no way limit the Contractor's liability arising out or relating to the performance of the Work or related activities.

13.1.7.9. Failure of Contractor and/or its Subcontractor(s) to comply with the insurance requirements herein shall be deemed a material breach of the Agreement.

13.1.8. Insurance Policy Limits

Unless different limits are indicated in the Special Conditions, the limits of insurance shall not be less than the following amounts:

Commercial General Liability	Includes: Bodily Injury, Property Damage, Personal & Advertising Injury, Product Liability and Completed Operations	$2,000,000 each occurrence; $4,000,000 general aggregate
Automobile Liability – Any Auto	Combined Single Limit	$2,000,000 per occurrence
Excess Liability (Umbrella)		$6,000,000 per occurrence; $6,000,000 aggregate
Workers Compensation		Statutory limits pursuant to State law
Employers' Liability		$2,000,000 each incident, each disease; $2,000,000 policy limit
Sexual Abuse & Molestation		$1,000,000 each incident; $2,000,000 policy limit
Builder's Risk (Course of Construction)		Issued for the value and scope of Work indicated herein.
Property of Others	Combined Single Limit General Aggregate	Issued for the value and scope of Work stored off-site.

13.2. Contract Security – Bonds

13.2.1. Contractor shall furnish two surety bonds issued by a California admitted surety insurer as follows:

13.2.1.1. **Performance Bond**: A bond in an amount at least equal to one hundred percent (100%) of Contract Price as security for faithful performance of this Contract.

13.2.1.2. **Payment Bond**: A bond in an amount at least equal to one hundred percent (100%) of the Contract Price as security for payment of persons performing labor and/or furnishing materials in connection with the Contract.

13.2.2. Cost of bonds shall be included in the Bid and Contract Price.

13.2.3. All bonds related to the Project shall be in the forms set forth in the Contract Documents and shall comply with all requirements of the Contract Documents, including, without limitation, the bond forms.

14. WARRANTY/GUARANTEE/INDEMNITY

14.1. Warranty/Guarantee

14.1.1. Contractor shall obtain and preserve for the benefit of the District, manufacturer's warranties on materials, fixtures, and equipment incorporated into the Work. All manufacturer, material, and fixture warranties shall commence at Project Completion. Contractor shall ensure that all warranties are maintained for the benefit of the District, regardless of the who the manufacturer is, who the installing Subcontractor was, if any, etc. While the District will fully expect the Contractor to manage all warranty work through all applicable warranty periods, the District must have that same ability if the Contractor fails to perform its warranty obligations as required.

14.1.2. In addition to guarantees required elsewhere, Contractor shall, and hereby does guarantee and warrant all Work against all defects for a period of **ONE (1)** year after the later of the following dates:

14.1.2.1. The date of completion as defined in Public Contract Code section 7107, subdivision (c),

14.1.2.2. The commissioning date for the Project, if any.

14.1.3. At the District's sole option, Contractor shall repair or replace any and all of that Work, together with any other Work that may be displaced in so doing, that may prove defective in workmanship and/or materials within a **ONE (1)** year period from date of Completion as defined above without expense whatsoever to District. In the event of failure of Contractor and/or Surety to commence and pursue with diligence said replacements or repairs within **TEN (10)** days after being notified in writing, Contractor and Surety hereby acknowledge and agree that District is authorized to proceed to have defects repaired and made good at expense of Contractor and/or Surety who hereby agree to pay costs and charges therefore immediately on demand.

14.1.4. If, in the opinion of District, defective work creates a dangerous condition or requires immediate correction or attention to prevent further loss to District or to prevent interruption of operations of District, District will attempt to give the notice required above. If Contractor or Surety cannot be contacted or neither complies with District's request for correction within a reasonable time as determined by District, District may, notwithstanding the above provision, proceed to make all corrections and/or provide attentions the District believes are necessary. The costs of correction or attention shall be charged against Contractor and Surety of the guarantees provided in this Article or elsewhere in the Contract Documents.

14.1.5. The above provisions do not in any way limit the guarantees on any items for which a longer guarantee is specified or on any items for which a manufacturer gives a guarantee for a longer period. Contractor shall furnish to District all appropriate guarantee or warranty certificates as indicated in the Specifications or upon request by District.

14.1.6. Nothing herein shall limit any other rights or remedies available to District.

14.2. Indemnity

14.2.1. To the furthest extent permitted by California law, Contractor shall indemnify, defend with legal counsel reasonably acceptable to the District, keep and hold harmless the District and its consultants, the Architect and its consultants, the Construction Manager and its consultants, separate contractors, and their respective board members, officers, representatives, contractors, agents, and employees, in both individual and official capacities ("Indemnitees"), against all suits, claims, damages, losses, and expenses, including but not limited to attorney's fees, caused by, arising out of, resulting from, or incidental to, the performance of the Work by Contractor, its Subcontractors, vendors, or suppliers, including, without limitation, any such suit, claim, damage, loss, or expense attributable to, without limitation, bodily injury, sickness, disease, death, alleged patent violation or copyright infringement, or to injury to or destruction of tangible property (including damage to the Work itself) including the loss of use resulting therefrom, except to the extent caused by the sole negligence, active negligence, or willful misconduct of the

Indemnitees, and/or to any extent that would render these provisions void or unenforceable. This agreement and obligation of Contractor shall not be construed to negate, abridge, or otherwise reduce any right or obligation of indemnity that would otherwise exist as to any party or person described herein. This indemnification, defense, and hold harmless obligation includes, without limitation:

14.2.1.1. Any failure or alleged failure by Contractor to comply with any provision of law, any failure or alleged failure to timely and properly fulfill all of its obligations under the Contract Documents in strict accordance with their terms, and without limitation, any stop payment notice actions or liens, including liens by the California Department of Labor Standards Enforcement.

14.2.1.2. Any claim arising (including bid protests) from any errors or mistakes in Contractor's bid documents provided to Subcontractors.

14.2.2. Contractor shall give prompt notice to the District in the event of any injury (including death), loss, or damage included herein. Without limitation of the provisions herein, if Contractor's agreement to indemnify, defend, and hold harmless the Indemnitees as provided herein against liability for damage arising out of bodily injury to persons or damage to property caused by or resulting from the negligence of any of the Indemnitees shall to any extent be or be determined to be void or unenforceable, it is the intention of the parties that these circumstances shall not otherwise affect the validity or enforceability of Contractor's agreement to indemnify, defend, and hold harmless the rest of the Indemnitees, as provided herein, and in the case of any such suits, claims, damages, losses, or expenses caused in part by the default, negligence, or act or omission of Contractor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, and in part by any of the Indemnitees, Contractor shall be and remain fully liable on its agreements and obligations herein to the full extent permitted by law.

14.2.3. In any and all claims against any of the Indemnitees by any employee of Contractor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, Contractor's indemnification obligation herein shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

14.2.4. The defense and indemnification obligations hereunder shall survive the Completion of Work, including the warranty/guarantee period, and/or the termination of the Agreement.

15. TIME

15.1. Notice to Proceed

District may issue a Notice to Proceed as indicated in the Instructions to Bidders or will otherwise instruct the Contractor to begin performing the Work of the Project.

15.2. Hours of Work

Work shall be performed during regular working hours as permitted by the appropriate governmental agency except that in the event of an emergency, or when required to complete the Work in accordance with job progress, Work may be performed outside of regular working hours with the advance written consent of the District and approval of any required governmental agencies. Contractor and Subcontractors shall continuously furnish sufficient forces to ensure the performance of the Work in accordance with the Construction Schedule. In no event will the District be responsible for the costs of Work performed outside of regular working hours, including, without limitation, overtime or weekend Work, unless expressly agreed to by the District in writing and approved in a Change Order.

15.3. Progress and Completion

15.3.1. Time of the Essence

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

15.3.2. No Commencement Without Insurance

15.3.2.1. Contractor shall not commence operations on the Project or elsewhere prior to the effective date of insurance and bonds. The date of commencement of the Work shall not be changed by the effective date of such insurance. If Contractor commences Work without insurance and bonds, all Work is performed at Contractor's peril and shall not be compensable until and unless Contractor secures bonds and insurance pursuant to the terms of the Contract Documents and subject to District's claim for damages.

15.4. Schedule

Contractor shall provide to District, Construction Manager, and Architect a schedule in conformance with the Contract Documents and as required in the Notice to Proceed and the Contractor's Submittals and Schedules section of these General Conditions.

15.5. Expeditious Completion

The Contractor shall proceed expeditiously with adequate forces and shall achieve Completion within the Contract Time.

16. EXTENSIONS OF TIME – LIQUIDATED DAMAGES

16.1. Contractor's Notice of Delay

16.1.1. In addition to the requirements indicated in this subsection, Contractor shall submit any request for an adjustment of the Contract Price or the Contract Time through the Change Order provisions in these General Conditions.

16.1.2. Contractor shall, within **FIVE (5)** calendar days of any delay impacting the critical path in completing the Work, notify District in writing of the causes of the delay including documentation and facts explaining the delay.

16.1.3. Any request by Contractor for an adjustment of the Contract Price or the Contract Time for a delay shall be submitted in accordance with the provisions in the Contract Documents governing changes in Work. When requesting time, requests must be submitted with full justification and documentation. Such justification must be based on the official Construction Schedule as updated at the time of occurrence of the delay or execution of Work related to any changes to the Scope of Work.

16.1.4. Any claim for delay must include the following information as support, without limitation:

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

16.1.4.2. Schedule Analysis. A detailed schedule analysis articulating the cause of any delay and explaining the delay's impact to critical path and each activity of the Project. This

analysis may be in the form of a time impact analysis. The time impact analysis shall provide all documentation and justification necessary to substantiate the requested extension. All supporting documentation shall be based on the then current Monthly Progress Schedule.

16.1.4.3. Logical Ties / Fragnets. Specific logical ties to the Contract Schedule for the proposed changes and/or delay showing the activity/activities in the Construction Schedule that are affected by the change and/or delay. (A portion of any delay of seven (7) days or more must be provided.) Include a "fragnet" analysis for the portion of the schedule and the activities the Contractor contends are impacted by the delay.

16.1.4.4. Updated Construction Schedule. A recovery or updated Construction Schedule must be submitted.

16.1.5. District shall review the facts and extent of any noticed delay and may grant Contract Time extension(s) of time for completing Work when, in the District's judgment, the findings of fact justify an extension.

16.1.6. Extension(s) of time shall apply only to that portion of Work affected by delay, and shall not apply to other portions of Work not so affected.

16.1.7. An extension of time may only be granted if Contractor has timely submitted the updated Construction Schedule as required herein.

16.1.8. Following submission of a notice of delay, the District may determine whether the delay is to be considered:

16.1.8.1. Excusable and Compensable, Excusable and Non-Compensable, or Unexcused;

16.1.8.2. How long the delay continues; and

16.1.8.3. To what extent the prosecution and Completion of the Work might be delayed thereby.

16.1.9. Contractor's failure to request adjustment(s) of the Contract Time in strict conformity with applicable provisions of the Contract Documents shall be deemed Contractor's waiver of its right to assert a claim for a delay.

16.1.10. Limitations Upon Adjustment of Contract Time on Account of Delays. Any adjustment of the Contract Time on account of an Excusable Delay or a Compensable Delay shall be limited as set forth herein. No adjustment of the Contract Time shall be made on account of any Excusable Delays or Compensable Delays unless those delay(s) actually and directly impact Work or Work activities on the critical path of the then current and updated approved Construction Schedule as of the date on which a delay first occurs. The District shall not be deemed in breach of, or otherwise in default of any obligation hereunder, if the District shall deny a request by the Contractor for an adjustment of the Contract Time for any delay that does not actually and directly impact Work on the then current and updated approved Construction Schedule. In submitting a request for an adjustment of Contract Time, and as a condition precedent to the District's review of that request, Contractor shall insert into the then current and updated approved Construction Schedule a "fragnet" analysis representing the event that Contractor claims to result in delay to the critical path as depicted in the updated approved Construction Schedule. If an Excusable Delay and a Compensable Delay occur concurrently, the maximum extension of the Contract Time shall be the number of days from the commencement of the first delay to the cessation of the delay that ends last. If an Unexcused Delay occurs concurrently with either an Excusable Delay or a Compensable Delay, the maximum extension of the Contract Time shall be the number of days, if any, which the Excusable Delay or the Compensable Delay exceeds the period of time of the Unexcused Delay.

16.2. Excusable and Compensable Delay(s)

16.2.1. Contractor is **not** entitled to additional compensation for any delay, even a delay caused by Adverse Weather or an Excusable Delay, unless **all** of the following conditions are met ("**Excusable and Compensable Delay**"):

16.2.1.1. The District is responsible for the delay;

16.2.1.2. The delay is unreasonable under the circumstances involved and impacts the critical path of the Work and extends the most current Contract Completion date;

16.2.1.3. The delay was not within the contemplation of District and Contractor;

16.2.1.4. Contractor complies with the Change Order procedures, and if necessary, the Claims procedures of the Contract Documents;

16.2.1.5. The delay could not have been avoided or mitigated by the Contractor's care, prudence, foresight, and diligence;

16.2.1.6. The delay extends the most current Contract Completion date; and

16.2.1.7. The delay is not concurrent with a Contractor-caused delay or other type of Excusable Delay.

16.2.2. In accordance with California Public Contract Code section 7102, if the Contractor's progress is delayed by the events described in the preceding subsection, Contractor shall not be precluded from the recovery of damages directly and proximately resulting therefrom. In that event, Contractor's damages, if any, shall be limited to direct, actual and unavoidable additional costs of labor, materials or construction equipment directly resulting from that delay, and shall exclude special, indirect or consequential damages. In no event shall Contractor seek costs or damages for delays, interruptions, hindrances or disruptions to the Work for on-Site or off-Site costs or damages based upon formulas, e.g. Eichleay or other formula. Except as expressly provided for herein, Contractor shall not have any other claim, demand or right to adjustment of the Contract Price arising out of delay, interruption, hindrance or disruption to the progress of the Work. Adjustments to the Contract Price and the Contract Time, if any, on account of Changes to the Work or Suspension of the Work shall be governed by the applicable provisions of the Contract Documents, including without limitation, the "Changes in the Work" section and the percentages in the "Format for Proposed Change" section of these General Conditions.

16.3. Excusable and Non-Compensable Delay(s)

16.3.1. An "Excusable Delay" shall mean an interruption of the Work beyond the reasonable control of the Contractor and that:

16.3.1.1. Could have not been avoided by the Contractor exercising care, prudence, foresight, and diligence, and

16.3.1.2. Actually extended the most current Project Completion date.

16.3.2. The Contractor may be entitled to an extension of the Project Completion date if there is an Excusable Delay, but the Contractor shall not be entitled to additional compensation for an Excusable Delay.

16.3.3. Force Majeure.

16.3.3.1. Excusable Delays are limited to interruptions that satisfy the above requirements and that are acts of God; acts of a public enemy; fires; floods; windstorms; tornadoes; earthquakes; wars; riots; insurrections; epidemics; pandemics; quarantine restrictions; strikes; lockouts; fuel shortages; freight embargoes; and Adverse Weather that satisfies the requirements herein ("**Force Majeure Events**").

16.3.3.2. If an Infectious Disease impacts the progress of the Work and Contractor demonstrates that the event satisfies the conditions of the Contract Documents for an adjustment to the Contract Time, it will be considered a Force Majeure Event.

16.3.3.3. In addition to any other requirement of the Contract Documents, Contractor shall not be entitled to any adjustment to the Contract Time unless Contractor submits a PCO and the District has issued a Change Order pursuant to the "Changes in the Work" provisions herein. If the Parties cannot in good faith and reasonably agree to an increase in the Contract Time, the Parties agree that dispute will be resolved pursuant to the Claims Resolution Process herein.

16.3.4. Contractor is aware that governmental agencies and utilities, including, without limitation, the Division of the State Architect, the Department of General Services, gas companies, electrical utility companies, water districts, and other agencies may have to approve Contractor-prepared drawings or approve a proposed installation. Contractor shall include in its bid, time for possible review of its drawings and for reasonable delays and damages that may be caused by such agencies. Contractor is not entitled to make a claim for damages or delays or an Excusable Delay arising from the review of Contractor's drawings or other approvals from the Division of the State Architect, the Department of General Services, gas companies, electrical utility companies, water districts, and other agencies.

16.3.5. Neither the financial resources of the Contractor or any person or entity directly or indirectly engaged by the Contractor in performance of any portion of the Work shall be deemed conditions beyond the control of the Contractor. If an event of Excusable Delay occurs, the Contract Time shall be subject to adjustment hereunder only if the Contractor establishes: (i) full compliance with all applicable provisions of the Contract Documents relative to the method, manner and time for Contractor's notice and request for adjustment of the Contract Time; (ii) that the event(s) forming the basis for Contractor's request to adjust the Contract Time are outside the reasonable control and without any fault or neglect of the Contractor or any person or entity directly or indirectly engaged by Contractor in performance of any portion of the Work; and (iii) that the event(s) forming the basis for Contractor's request to adjust the Contract Time directly and adversely impacted the critical path of the Work as indicated in the approved Construction Schedule or the most recent updated approved Construction Schedule relative to the date(s) of the claimed event(s) of Excusable Delay.

16.3.6. <u>Computation of Time / Adverse Weather</u>

16.3.6.1. The Contractor will only be allowed a time extension for Adverse Weather conditions if requested by Contractor within five (5) calendar days of the Adverse Weather event, and only if **<u>all</u>** of the following conditions are met – thereby making the resulting delay an Excusable Delay.

16.3.6.1.1. The weather conditions constitute Adverse Weather, as defined herein and further specified in the Special Conditions;

16.3.6.1.2. Contractor can verify that the Adverse Weather caused delays in excess of five (5) hours of the indicated labor required to complete the scheduled tasks of Work on the day affected by the Adverse Weather;

16.3.6.1.3. The Contractor's crew is dismissed as a result of the Adverse Weather; and

16.3.6.1.4. The number of days of delay exceed those indicated in the Special Conditions.

16.3.6.2. A day-for-day extension will only be allowed for those days in excess of those indicated in the Special Conditions and only if the tasks of Work on the day affected by the Adverse Weather were tasks required to be performed on that day to maintain the critical path of the Construction Schedule.

16.3.6.3. The Contractor shall work seven (7) days per week, if necessary, irrespective of inclement weather, to maintain access and the Construction Schedule, and to protect the Work under construction from the effects of Adverse Weather, all at no further cost to the District.

16.3.6.4. The Contract Time has been determined with consideration given to the average climate weather conditions prevailing in the County in which the Project is located.

16.4. Unexcused Delay(s) – Liquidated Damages

16.4.1. Unexcused delays refer to any delay to the progress of the Work caused by events or factors other than those specifically identified in the "Excusable and Compensable Delay(s)" or the "Excusable and Non-Compensable Delay(s)" sections above ("**Unexcused Delays**"). Neither the Contract Price nor the Contract Time shall be adjusted on account of Unexcused Delays.

16.4.2. Contractor and District hereby agree that the exact amount of damages for failure to complete the Work within the time specified is extremely difficult or impossible to determine. If the Work is not completed within the time specified in the Contract Documents, it is understood that the District will suffer damage. It being impractical and unfeasible to determine the amount of actual damage, it is agreed the Contractor shall forfeit and pay to District as fixed and liquidated damages, and not as a penalty, the amount set forth in the Agreement for each calendar day of delay in Completion. Contractor and its Surety shall be liable for the amount thereof pursuant to Government Code section 53069.85.

16.4.3. Contractor shall not forfeit or pay liquidated damages for an Excusable Delay or an Excusable and Compensable Delay.

17. CHANGES IN THE WORK

17.1. No Changes Without Authorization

17.1.1. There shall be no change whatsoever in the Drawings, Specifications, or in the Work without an executed Change Order, a written Unilateral Change Order, or a written Force Account Directive authorized by the District as herein provided. District shall not be liable for the cost of any extra work, any changes to the Contract Time, or any substitutions, changes, additions, omissions, or deviations from the Drawings and Specifications unless the District's governing board has authorized the same and the cost thereof has been approved in writing by an executed Change Order, a written Unilateral Change Order, or a written Force Account Directive.

17.1.2. Verbal Order of Change in the Work. Any verbal order, direction, instruction, interpretation, or determination from the District, the Project Inspector or the Architect which in the opinion of the Contractor causes any change to the scope of the Work, or otherwise requires an adjustment to the Contract Price or the Contract Time, shall be treated as a Change only if the Contractor gives the Architect written notice within three (3) Business Days of the order, directions, instructions, interpretation or determination and prior to acting in accordance therewith. Time is of the essence in Contractor's written notice pursuant to the preceding sentence so that the District can promptly investigate and consider alternative measures to address the order, direction, instruction, interpretation or determination giving rise to Contractor's notice. Accordingly, Contractor acknowledges that its failure, for any reason, to give written notice within three (3) Business Days of any verbal order, direction, instruction, interpretation or

determination shall be deemed Contractor's waiver of any right to assert or claim any entitlement to an adjustment of the Contract Time or the Contract Price on account of that verbal order, direction, instruction, interpretation or determination. The written notice shall state the date, circumstances, extent of adjustment to the Contract Price or the Contract Time, if any, requested, and the source of the verbal order, directions, instructions, interpretation or determination that the Contractor regards as a Change. Unless the Contractor acts in strict accordance with this procedure, any verbal order, direction, instruction, interpretation or determination shall not be treated as a Change and the Contractor hereby waives any claim for any adjustment to the Contract Price or the Contract Time on account thereof.

17.1.3. The Surety, in executing and providing the Performance Bond and the Payment Bond, shall be deemed to have expressly agreed to any change to the Contract and to any extension of time made by reason thereof.

17.1.4. No extension of time for performance of the Work shall be allowed hereunder unless claim for such extension is made at the time changes in the Work are ordered, and such time duly adjusted in writing in the Change Order, Unilateral Change Order, or Force Account 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.

17.1.5. Contractor shall perform immediately all work that has been authorized by a fully executed Change Order, Unilateral Change Order, or Force Account Directive. Contractor shall be fully responsible for any and all delays and/or expenses caused by Contractor's failure to expeditiously perform this Work and Contractor's failure or refusal to so proceed with that Work may be deemed to be Contractor's default of a material obligation of the Contractor under the Contract Documents.

17.1.6. Should any Change Order result in an increase in the Contract Price, the cost of that Change Order shall be agreed to, in writing, in advance by Contractor and District and be subject to the monetary limitations set forth in Public Contract Code section 20118.4. In the event that Contractor proceeds with any change in Work without a Change Order executed by the District, Unilateral Change Order, or Force Account Directive, Contractor waives any claim of additional compensation or time for that additional work.

17.1.7. Contractor understands, acknowledges, and agrees that the reason for District authorization is so that District may have an opportunity to analyze the Work and decide whether the District shall proceed with the Change Order or alter the Project so that a change in Work becomes unnecessary.

17.1.8. In an emergency affecting safety of life or of work or of adjoining property, Contractor, without special instruction or authorization, shall act, at its discretion, to prevent all threatened loss or injury. Any compensation or time claimed by Contractor on account of emergency work shall be determined as indicated herein as a PCO.

17.1.9. No payments will be made, nor will District accept proposed change orders until the Contractor has complied with all the requirements of the Escrow of Bid Documentation document (if applicable).

17.2. Architect Authority

The Architect will have authority to order minor changes in the Work not involving any adjustment in the Contract Price, or an extension of the Contract Time, or a change that is inconsistent with the intent of the Contract Documents. These changes shall be effected by written Change Order, Unilateral Change Order, or by Architect's response(s) to RFI(s).

17.3. Change Orders

17.3.1. A Change Order is a written instrument prepared and issued by the District and/or the Architect

and signed by the District (as authorized by the District's governing board), the Contractor, the Architect, and approved by the Project Inspector (if necessary) and DSA (if necessary), stating their agreement regarding all of the following:

17.3.1.1. A description of a change in the Work;

17.3.1.2. The amount of the adjustment in the Contract Price, if any; and

17.3.1.3. The extent of the adjustment in the Contract Time, if any.

17.3.2. If a Change Order is required to be approved by DSA, the District may call it a Construction Change Document.

17.3.3. If the District approves a Change, the District or the Architect shall provide a written Change Order to the Contractor describing the Change and setting forth the adjustment to the Contract Time and the Contract Price, if any, on account of that Change. All Change Orders shall be full payment and final settlement of all rights for direct, indirect and consequential costs, including without limitation, costs of delays or impacts related to, or arising out of, items covered and affected by the Change Order, as well as any adjustments to the Contract Time. Any demand or request for an adjustment to the Contract Time or the Contract Price relating to any Change incorporated into a Change Order not presented by the Contractor for inclusion in the Change Order shall be deemed waived. The Contractor shall execute the Change Order prepared pursuant to the foregoing. After the Change Order has been prepared and forwarded to the Contractor for execution, the Contractor shall not modify or amend the form or content of such Change Order, or any portion thereof.

17.4. Unilateral Change Orders

17.4.1. A Unilateral Change Order is a written order prepared and issued by the District, the Construction Manager, and/or the Architect and signed by the District, directing a change in the Work. The District may as provided by law, by Unilateral Change Order and without invalidating the Contract, order changes in the Work consisting of additions, deletions, or other revisions. Any dispute as to the sum of the Unilateral Change Order or timing of payment shall be resolved pursuant to the Payment provisions and the Claims provisions herein. **A Unilateral Change Order is NOT a Construction Change Document (which is defined above as a Change Order that DSA must approve)**.

17.4.2. The District may issue a Unilateral Change Order in the absence of agreement on the terms of a Change Order.

17.5. Force Account Directives

17.5.1. When work, for which a definite price has not been agreed upon in advance, is to be paid for on a force account basis, all direct costs necessarily incurred and paid by the Contractor for labor, material, and equipment used in the performance of that Work, shall be subject to the approval of the District and compensation will be determined as set forth herein.

17.5.2. District will issue a Force Account Directive to proceed with the Work on a force account basis, and a not-to-exceed budget will be established by District.

17.5.3. All requirements regarding direct cost for labor, labor burden, material, equipment, and markups on direct costs for overhead and profit described in this section shall apply to Force Account Directives. However, District will only pay for actual costs verified in the field by the District or its authorized representative(s) on a daily basis.

17.5.4. Contractor shall be responsible for all cost related to the administration of Force Account

Directive. The markup for overheard and profit for Contractor modifications shall be full compensation to the Contractor to administer Force Account Directive.

17.5.5. Contractor shall notify District or its authorized representative(s) at least twenty-four (24) hours prior to proceeding with any of the force account work. Furthermore, the Contractor shall notify the District when it has consumed eighty percent (80%) of the budget, and shall not exceed the budget unless specifically authorized in writing by the District. Contractor will not be compensated for force account work in the event that Contractor fails to timely notify the District regarding the commencement of force account work, or exceeding the force account budget.

17.5.6. Contractor shall diligently proceed with the work, and on a daily basis, submit a daily force account report on a form supplied by the District no later than 5:00 p.m. each day. The report shall contain a detailed itemization of the daily labor, material, and equipment used on the force account work only. The names of the individuals performing the force account work shall be included on the daily force account reports. The type and model of equipment shall be identified and listed. District will review the information contained in the reports, and sign the reports no later than the next work day, and return a copy of the report to Contractor for its records. District will not sign, nor will Contractor receive compensation for work District cannot verify. Contractor will provide a weekly force account summary indicating the status of each Force Account Directive in terms of percent complete of the not-to-exceed budget and the estimated percent complete of the work.

17.5.7. In the event Contractor and District reach a written agreement on a set cost for the work while the work is proceeding based on a Force Account Directive, the Contractor's signed daily force account reports shall be discontinued and all previously signed reports shall be invalid.

17.6. Price Request

17.6.1. Definition of Price Request. A Price Request ("PR") is a written request prepared by the Architect or the District, requesting the Contractor to submit to the District and the Architect an estimate of the effect of a proposed change in the Work on the Contract Price and the Contract Time.

17.6.2. Scope of Price Request. A Price Request shall contain adequate information, including any necessary Drawings and Specifications, to enable Contractor to provide the cost breakdowns required herein. Contractor shall not be entitled to any additional compensation for preparing a response to a Price Request, whether ultimately accepted or not.

17.6.3. Contractor shall not consider Price Requests to be instructions either to stop work in progress or to execute the proposed change.

17.6.4. Within the time specified in Price Request after receipt of Price Request, Contractor shall submit a quotation estimating cost adjustments to the Contract Price and the Contract Time necessary to execute the change, with the following documentation and information:

17.6.4.1. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.

17.6.4.2. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.

17.6.4.3. Include costs of labor and supervision directly attributable to the change.

17.6.4.4. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times,

and activity relationship. Use available total float before requesting an extension of the Contract Time.

17.7. Proposed Change Order

17.7.1. Proposed Change Order. The Contractor may issue a Proposed Change Order ("PCO"), only as a written request prepared by it to the District and the Architect, requesting that the District issue a Change Order based upon a proposed change to the Work.

17.7.2. Changes in Contract Price. A PCO shall include breakdowns pursuant to the provisions herein to validate any change in Contract Price and include all reasonable documentation as required herein.

17.7.3. Changes in Time. A PCO shall also include any changes in time required to complete the Project. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationships. Use available total float before requesting an extension of the Contract Time. 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 Construction Schedule as defined in the Contract Documents. If Contractor fails to request a time extension in a PCO, then the Contractor is thereafter precluded from requesting time and/or claiming a delay. If the Contractor is requesting additional time and believes that time is both Excusable and Compensable, then the Contractor must provide detailed documentation that supports its position and that addresses all the components of the "Excusable and Compensable Delay(s)" section above.

17.7.4. Unknown and/or Unforeseen Conditions. If Contractor submits a PCO requesting an increase in Contract Price and/or Contract Time that is based at least partially on Contractor's assertion that Contractor has encountered unknown and/or unforeseen condition(s) on the Project, then Contractor shall base the PCO on provable information that, beyond a reasonable doubt and to the District's satisfaction, demonstrates that the unknown and/or unforeseen condition(s) were actually unknown and/or unforeseen and that the condition(s) were reasonably unknown and/or unforeseen. If not, the District shall deny the PCO and the Contractor shall complete the Project without any increase in Contract Price and/or Contract Time based on that PCO.

17.7.5. Time to Submit PCO. Contractor shall submit its PCO within five (5) days of the date Contractor discovers, or reasonably should discover, the circumstances giving rise to the proposed change order, unless additional time to submit a proposed change order is granted in writing by the District. Time is of the essence in Contractor's written notice pursuant to the preceding sentence so that the District can promptly investigate and consider alternative measures to the address the basis for the PCI. Accordingly, Contractor acknowledges that its failure, for any reason, to give written notice (with Supporting Documentation to permit the District's review and evaluation) within this time frame shall be deemed Contractor's waiver, release, discharge and relinquishment of any right to assert or claim any entitlement to an adjustment of the Contract Time or the Contract Price on account of the circumstances giving rise to the PCO.

17.7.6. Infectious Disease(s).

17.7.6.1. Contractor agrees that its bid, the Contract Price and the Contract Time are based on the Contractor's full compliance with all applicable and existing federal, state, and/or local statutes, orders, rules, regulations, ordinances, and/or directives relating to construction site safety in connection with any pandemic, public health emergency, Infectious Disease(s) (as defined herein) including COVID-19, and/or any similar virus or derivative strain at the time of Contract award. Therefore, any cost or delay associated with Infectious Disease(s), or any derivative or similar strain thereof, or any federal, state, or local order relating thereto, shall not be considered compensable unless:

17.7.6.1.1. It occurred after the date of the award of the Contract to Contractor;

17.7.6.1.2. It materially increases the Contract Price or the Contract Time; and

17.7.6.1.3. Contractor notifies the District within 10 days of notice of any a new derivative, strain, or new public health order(s), including the anticipated increase to the Contract Price or Contract Time due to the new derivative, strain, or new public health order(s), and Contractor substantiates those costs with detailed supporting documentation as required for a PCO.

17.7.6.2. If, during the construction of the Project, the applicable and existing federal, state, and/or local statutes, orders, rules, regulations, ordinances, and/or directives relating to construction site safety in connection with Infectious Disease(s), and/or any similar virus or derivative strain, are changed or rescinded (e.g., by the reduction of potential exposure or risk due to vaccinations), the Parties agree to reduce the Contract Price and the Contract Time due to the removal of the required efforts. If the Parties cannot mutually agree on the appropriate reduction, the District may issue a Unilateral Change Order for an amount of time and money it determines to be both reasonable and appropriate. The Parties agree that any dispute related to this provision will be resolved pursuant to the Claims Resolution Process herein.

17.8. Format for Proposed Change Order

17.8.1. The following "Format For Proposed Change For Subcontractor Performed Work" and "Format For Proposed Change For Contractor Performed Work" shall be used as applicable by the District and the Contractor (e.g. Change Orders, PCO's) to communicate proposed additions and deductions to the Contract, supported by attached documentation.

FORMAT FOR PROPOSED CHANGE FOR <u>SUBCONTRACTOR</u> PERFORMED WORK

	<u>SUBCONTRACTOR PERFORMED WORK</u>	**<u>ADD</u>**	**<u>DEDUCT</u>**
(A)	**<u>Labor Charge</u>** 1. **Hours.** Attach total itemized hours, by each Subcontractor at each tier. 2. **Rate.** This shall be no more than the Straight-Time Total Hourly Rate as determined by the Department of Industrial Relations ("DIR") for the applicable labor category.		
(B)	**<u>Labor Burden & Worker's Compensation Charge</u>** 1. This shall be no more than **<u>twenty percent (20%)</u>** of **item (A)**, the Labor Charge. 2. This shall be the total cumulative charge permitted for all Subcontractors or all labor performed by the Subcontractor or Subcontractor's Subcontractor(s) (i.e., all "lower-tier" Subcontractor(s)).		
(C)	**<u>Subtotal (A+B)</u>**		
(D)	**<u>Material Charge</u>** Attach itemized quantity and unit cost plus sales tax and invoice(s) from vendor(s).		
(E)	**<u>Equipment Charge</u>** Attach invoice(s) from supplier(s).		
(F)	**<u>Subtotal (C+D+E)</u>**		
(G)	**<u>Subcontractor's Overhead and Profit Charge</u>** 1. This shall be no more than **<u>eight percent (8%)</u>** of **item (F)**. 2. This shall be the total cumulative mark-up permitted for the Subcontractor and Subcontractor's Subcontractor(s) (i.e., all "lower-tier" Subcontractor(s)).		
(H)	**<u>Subtotal (F+G)</u>**		
(I)	**<u>Contractor's Overhead, Profit, Bond and Insurance</u>** 1. This shall be no more than **<u>six percent (6%)</u>** of **Item (F)**. 2. This shall be the total mark-up permitted for Contractor.		
(J)	**<u>TOTAL (H+I)</u>**		
(K)	**<u>Time</u>**	**_____ Days**	

FORMAT FOR PROPOSED CHANGE FOR CONTRACTOR PERFORMED WORK

	CONTRACTOR PERFORMED WORK	ADD	DEDUCT
(A)	**Labor Charge** 1. **Hours.** Attach total itemized hours. 2. **Rate.** This shall be no more than the Straight-Time Total Hourly Rate as determined by the Department of Industrial Relations ("DIR") for the applicable labor category.		
(B)	**Labor Burden & Worker's Compensation Charge** 1. This shall be no more than **twenty percent (20%)** of **item (A)**, the Labor Charge. 2. This shall be the total cumulative charge permitted for all labor performed by Contractor.		
(C)	**Subtotal (A+B)**		
(D)	**Material Charge** Attach itemized quantity and unit cost plus sales tax and invoice(s) from vendor(s).		
(E)	**Equipment Charge** Attach invoice(s) from supplier(s).		
(F)	**Subtotal (C+D+E)**		
(G)	**Contractor's Overhead, Profit, Bond and Insurance** 1. This shall be no more than **six percent (6%)** of **Item (F)**. 2. This shall be the total mark-up permitted for Contractor.		
(H)	**TOTAL (F+G)**		
(I)	**Time**	**_____ Days**	

17.8.2. All Proposed Change Order requests by Contractor for a change shall include a complete itemized breakdown with the following detail:

17.8.2.1. Labor. Labor breakdown by trade classification, wage rates, and estimated hours. Labor costs shall only include fringe benefits indicated by governing trade organizations. Wages shall not exceed current prevailing wages in the locality for performance of the changes.

17.8.2.1.1. The Contractor's or Subcontractors' labor burden and Workers' Compensation premium shall only be charged as indicated herein. In no event shall Contractor include any other charges than as indicated herein without the prior written approval of the District.

17.8.2.2. Material. Material quantities, and types of products, and transportation costs, if applicable.

17.8.2.3. Equipment. Equipment breakdown by make, type, size, rental rates (if not owned), equipment hours and transportation costs, if applicable.

17.8.2.3.1. The equipment costs shall not exceed one hundred percent (100%) of the Association of Equipment Distributors (AED) rental rates and delay factors or Caltrans rates and delay factors, whichever is less. Hourly, daily, weekly, or monthly rates shall be used, whichever is lower. Hourly rates including operator shall not be used.

17.8.2.3.2. The time to be paid for equipment shall be the actual time that the equipment is in (1) productive operation on the Work or (2) idled because of the event or circumstance giving rise to the Proposed Change Order.

17.8.2.3.2.1. To calculate the costs of idle equipment, the Contractor must use the applicable idle equipment rate. For example, and clarification purposes only, if the rate for "X" piece of equipment is $100 and the applicable delay factor is .20 for that piece of equipment, then the hourly rate for idle equipment shall be $20 ($100 x .20), which shall be applied against the number of hours idle. In no event shall Contractor charge an amount greater than 50% of the applicable equipment rate for idle equipment.

17.8.2.3.2.2. In computing the hourly rental of equipment, any time less than thirty (30) minutes shall be considered one-half (1/2) hour.

17.8.2.3.2.3. No payment will be made for time while equipment is inoperative due to breakdown, or for non-workdays.

17.8.2.3.2.4. The rental time shall not include the time required to move the equipment to and from the project site. No mobilization or demobilization will be allowed for equipment already on site. If equipment is not moved by its own power, then loading and transportation costs will be paid in lieu of rental time thereof. However, neither moving time nor loading and transportation costs will be paid if the equipment is used on the Project Site in any other way than upon the work directly related to the event or circumstance giving rise to the Proposed Change Order.

17.8.2.3.3. Individual pieces of equipment having a replacement value of one thousand dollars ($1,000) or less shall be considered to be small tools or small equipment, and no payment will be made since the costs of these tools and equipment is included as part of the markup for overhead and profit defined herein.

17.8.2.3.4. Payment to the Contractor for the use of equipment as set forth above shall constitute full compensation to the Contractor for the cost of fuel, power, oil, lubricants,

supplies, small equipment, necessary attachments, repairs and maintenance of any kind, depreciation, storage, insurance, labor (except for equipment operators), and any and all costs to the Contractor incidental to the use of the equipment.

17.8.2.3.5. Should Contractor, or any of its owners, officers, directors or agents, hold any ownership interest in any company, organization, association or corporation from whom rental equipment is secured. Contractor shall immediately notify District of such and the price set for any such rental shall be agreed upon in advance by the Contractor and the District.

17.8.2.4. Overhead, Profit, Bond and Insurance Costs. Markup for overhead and profit, which shall be used to compensate Contractor for all costs for all administration, general conditions, and supervision, including, without limitation:

17.8.2.4.1. All home office overhead, field office overhead, field office personnel including, but not limited to, principals, project managers, superintendents, supervisory foremen, estimators, project engineers, detailers, draftsmen, schedulers, consultants, watchmen, payroll clerks, administrative assistants, labor compliance costs and secretaries.

17.8.2.4.2. All field and field office expenses including, but not limited to, field trailers, parking, storage sheds, office equipment and supplies, telephone service and long distance telephone calls, computers, fax machines, temporary utilities, sanitary facilities and services, janitorial services, small tools and equipment with a cost under $1000 each, portable scaffolding, blocking, shores, appliances, job vehicles, security and fencing, conformance to regulatory requirements including compliance to safety regulations, safety programs and meetings, cartage, warranties, As-Built Drawings, as well as any related maintenance costs.

17.8.2.4.3. Administrative functions such as, but not limited to, reviewing, coordinating, distributing, processing, posting, recording, estimating, negotiating, expediting, engineering, drawing, detailing, revising shop drawings, carting, cleaning, protecting the work, and other incidental Work related to the change.

17.8.2.4.4. All other costs and taxes required to be paid, but not included under direct costs as defined above including, without limitation, payroll taxes, social security, etc.

17.8.2.4.5. All costs for Contractor's bonds and insurance.

17.8.2.4.6. Taxes: Federal excise tax shall not be included. District will issue an exemption on request.

17.8.2.5. Contract Time. Justification for any adjustment in Contract Time including a schedule analysis identifying critical schedule activities delayed by the request. Contract Time shall be extended or reduced by Change Orders, Unilateral Change Orders, or Force Account Directives for a period of time commensurate with the time reasonably necessary to perform a Change. This time must be requested in writing by the Contractor with the Price Request, PCO, or expressly in writing as part of its documentation for Unilateral Change Orders, or Force Account Directives. The Contractor shall justify any Contract Time extension by submittal of a schedule analysis as required in this Changes section of these General Conditions accurately portraying the impact of the change on the critical path of the Construction Schedule. Changes performed within available float shall not justify an extension to the Contract Time. The District shall make the final determination of the amount of Contract Time to allocate to any Change.

17.8.2.6. Supporting Documentation. Contractor shall include with each PCO, along with the itemized breakdown as required herein, reasonable documentation substantiating the

requested change in the Contract Price and Contract Time. If the District deems Contractor's supporting documentation incomplete or inadequate to substantiate the requested change to the Contract Price and Contract Time, the District may request that Contractor supplement the PCO with additional, reasonable supporting documentation.

17.9. Change Order Certification

17.9.1. All Change Orders and PCOs shall include the following certification by the Contractor. The Parties acknowledged that if a Change Order is approved that does not include this language, that Change Order shall be deemed to include this certification language:

> ***The Contractor approves the foregoing as to the changes, if any, and the price specified for each item and the extension of time allowed, if any, for completion of the entire Work as stated herein, and agrees to furnish all labor, materials, and service, and perform all work necessary to complete all additional work specified for the consideration stated herein. Submission of sums that have no basis in fact or which Contractor knows are false are at the sole risk of Contractor and may be a violation of the False Claims Act set forth under Government Code section 12650 et seq. It is understood that the changes herein to the Contract shall only be effective when approved by the governing board of the District. It is expressly understood that the value of the extra Work or changes includes all of the Contractor's costs, expenses, field overhead, home office overhead, profit, both direct and indirect, resulting from additional time required on the Project or resulting from delay to the Project. Any costs, expenses, damages, or time extensions not included are deemed waived.***

17.10. Determination of Change Order Cost

17.10.1. The amount of the increase or decrease in the Contract Price from a Change Order, if any, shall be determined in one or more of the following ways as applicable to a specific situation and at the District's discretion:

17.10.1.1. District acceptance of a PCO;

17.10.1.2. By agreement between District and Contractor.

17.10.1.3. By unit prices or alternates contained in Contractor's original bid. If the Bid for the Work included proposal(s) for Alternate Bid Item(s), during Contractor's performance of the Work, the District may elect to add any such Alternate Bid Item(s) if the that item did not form a basis for award of the Contract or delete any such Alternate Bid Item(s) if that item formed a basis for award of the Contract. If the District elects to add or delete an Alternate Bid Item(s) pursuant to the foregoing, the cost or credit for that Alternate Bid Item(s) shall be as set forth in the Contractor's Bid, at the District's discretion. If any Alternate Bid Item is added or deleted from the Work pursuant to the foregoing, the Contract Time shall be adjusted by the number of days allocated for the added or deleted Alternate Bid Item in the Contract Documents; if days are not allocated for any Alternate Bid Item added or deleted pursuant to the foregoing, the Contract Time shall be equitably adjusted.

17.10.1.4. By the District, based upon actual and necessary costs incurred by the Contractor as determined by the District on the basis of the Contractor's records. Promptly upon determining the extent of adjustment to the Contract Price, the District shall notify the Contractor in writing of the same; the Contractor shall be deemed to have accepted the District's determination of the amount of adjustment to the Contract Price on account of a Change to the

Work unless Contractor shall notify the District, in writing, not more than fifteen (15) days from the date of the District's written notice, of any objection to the District's determination. Failure of the Contractor to timely notify the District of Contractor's objections to the District's determination of the extent of adjustment to the Contract Price shall be deemed Contractor's acceptance of the District's determination and a waiver of any right or basis of the Contractor to thereafter protest or otherwise object to the District's determination. Notwithstanding any objection of the Contractor to the District's determination of the extent of any adjustment to the Contract Price pursuant to this provision, Contractor shall diligently proceed to perform and complete any such Change.

17.11. Deductive Change Orders

If Contractor offers a proposed amount for a deductive Change Order(s), Contractor shall include a minimum of five percent (5%) total overhead and profit to be deducted with the amount of the work of the Change Order(s). If Subcontractor work is involved, Subcontractors shall also include a minimum of five percent (5%) overhead and profit to be deducted with the amount of its deducted work, for a total minimum of ten percent (10%) total overhead and profit to be deducted. Any deviation from this provision shall not be allowed.

17.12. 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 omission in the Work as provided herein.

17.13. Accounting Records

With respect to portions of the Work performed by Change Orders, Unilateral Change Orders, or Force Account Directives, Contractor shall keep and maintain cost-accounting records satisfactory to the District, which shall be available to the District on the same terms as any other books and records Contractor is required to maintain pursuant to the Contract Documents.

17.14. Notice Required

If Contractor is seeking an adjustment in the Contract Price, or any extension in the Contract Time for Completion, it shall notify District pursuant to the provisions of the Contract Documents. No adjustment in the Contract Price or Contract Time shall be considered unless made in accordance with the Contract Documents. Contractor shall proceed to execute the Work even though the adjustment may not have been agreed upon. Any change in the Contract Price or extension of the Contract Time resulting from such contract adjustment shall only be authorized by a Change Order.

17.15. Applicability to Subcontractors

Any requirements under this Article shall be equally applicable to Change Orders, Unilateral Change Orders, or Force Account Directives issued to Subcontractors by the Contractor to the extent as required by the Contract Documents.

17.16. Alteration to Change Order Language

Contractor shall not alter Change Orders or reserve time in Change Orders. Contractor shall execute finalized Change Orders and proceed under the provisions herein with proper notice.

17.17. Failure of Contractor to Execute Change Order

Contractor shall be in default of the Contract if Contractor fails to execute a Change Order when the Contractor agrees with the addition and/or deletion of the Work in that Change Order.

18. REQUEST FOR INFORMATION

18.1. Any Request for Information ("RFI") shall reference all applicable Contract Document(s), including Specification section(s), detail(s), page number(s), drawing number(s), and sheet number(s), etc. Contractor shall make suggestions and interpretations of the issue raised by each RFI. An RFI cannot modify the Contract Price, Contract Time, or the Contract Documents.

18.2. Contractor shall be liable to the District for all costs incurred by the District associated with the processing, reviewing, evaluating and responding to any RFI, including without limitation, fees of the Architect and any other design consultant to the Architect or the District, that District reasonably determines:

18.2.1. Does not reflect adequate or competent supervision or coordination by the Contractor or any Subcontractor; or

18.2.2. Does not reflect the Contractor's adequate or competent knowledge of the requirements of the Work or the Contract; or

18.2.3. Requests an interpretation or decision of a matter where the information sought is equally available to the Contractor; or

18.2.4. Is not justified for any other reason.

18.3. Prior to submitting the RFI, Contractor shall diligently review the Contract Documents for information responsive to the RFI, including information incorporated by reference. Contractor should not issue an RFI regarding information contained in or inferable from the Contract Documents, including information incorporated by reference. An RFI is invalid if the RFI response is contained in or inferable from the Contract Documents.

18.4. Contractor shall be responsible for preparing and submitting each RFI so as to not cause delay to the progress of the Work nor to cause any impact to the Contractor's labor productivity. An RFI may be considered untimely if not submitted within **Forty Eight (48) hours** of receipt from a Contractor's subcontractor. Untimely submission of any RFI will preclude Contractor from asserting any claims for delay or for labor impact against the District.

18.5. If the Contractor fails to timely notify the Architect in writing of any Conditions encountered and the Contractor proceeds to perform any portion of the Work containing or affected by such Conditions the Contractor shall bear all costs associated with or required to correct, remove, or otherwise remedy any portion of the Work affected thereby without adjustment of the Contract Time or the Contract Price. In requesting information of the District to address and resolve any conditions, the Contractor shall act with promptness in submitting any written request so as to allow the District a reasonable period of time to review, evaluate and respond to any request, taking into account the then current status of the progress and completion of the Work and the actual or potential impact of any conditions upon the completion of the Work within the Contract Time. The Contract Time shall not be subject to adjustment in the event that the Contractor shall fail to timely request information from the District.

19. PAYMENTS

19.1. Contract Price

19.1.1. The Contract Price is stated in the Agreement and, including authorized adjustments, is the total amount payable by the District to the Contractor for performance of the Work pursuant to the Contract Documents. If all or a portion of the Project is being funded by funds requiring approval by the State Allocation Board (SAB), payment may be subject to that approval being received, funding by the SAB, and funds being released by the Office of Public School Construction (OPSC).

19.2. Applications for Progress Payments

19.2.1. Procedure for Applications for Progress Payments

19.2.1.1. Application for Progress Payment

19.2.1.1.1. Not before the fifth (5^{th}) day of each calendar month during the progress of the Work, Contractor shall submit to the District and the Architect an itemized Application for Payment for Work completed in accordance with the Schedule of Values. The Application for Payment shall be notarized, if required, and supported by the following or each portion thereof unless waived by the District in writing:

19.2.1.1.1.1. The amount paid to the date of the Application for Payment to the Contractor, to all its Subcontractors, and all others furnishing labor, material, or equipment for its Contract;

19.2.1.1.1.2. The amount being requested by 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;

19.2.1.1.1.3. The balance that will be due to each of the entities after payment is made;

19.2.1.1.1.4. A certification that the As-Built Drawings and annotated Specifications are current;

19.2.1.1.1.5. An Itemized breakdown of Work performed;

19.2.1.1.1.6. An updated and acceptable construction schedule in conformance with the provisions herein;

19.2.1.1.1.7. The additions to and subtractions from the Contract Price and Contract Time;

19.2.1.1.1.8. A total of the retention held;

19.2.1.1.1.9. The material invoices, evidence of equipment purchases, rentals, and other support and details of cost as the District may require from time to time;

19.2.1.1.1.10. The percentage of completion of the Contractor's Work by line item;

19.2.1.1.1.11. The Schedule of Values updated from the preceding Application for Payment;

19.2.1.1.1.12. A duly completed and executed conditional waiver and release upon progress payment compliant with Civil Code section 8132 from each subcontractor of any tier and supplier to be paid from the current progress payment;

19.2.1.1.1.13. A duly completed and executed unconditional waiver and release upon progress payment compliant with Civil Code section 8134 from each subcontractor of any tier and supplier that was paid from the previous progress payment; and

19.2.1.1.1.14. A certification by the Contractor of the following:

The Contractor warrants title to all Work performed as of the date of this payment application. The Contractor further warrants that all Work performed as of the date of this payment application is free and clear of liens, claims, security interests, or encumbrances in favor of the Contractor, Subcontractors, material and equipment suppliers, workers, or other persons or entities making a claim by reason of having provided labor, materials, and equipment relating to the Work, except those of which the District has been informed.

19.2.1.1.1.15. If requested by the District, a third party, or as required by the California Department of Industrial Relations, all requested or required certified payroll record ("CPR(s)") for each journeyman, apprentice, worker, or other employee employed by the Contractor and/or each Subcontractor in connection with the Work for the period of the Application for Payment.

19.2.1.1.2. Except as expressly provided for herein, no payments shall be made by the District on account of any item of the Work, including without limitation, materials or equipment that, at the time of the Contractor's submittal of an Application for Progress Payment, has/have not been incorporated into and made a part of the Work.

19.2.1.1.3. Contractor shall be subject to the False Claims Act set forth under Government Code section 12650 et seq., for information provided with any Application for Progress Payment.

19.2.2. Prerequisites for Progress Payments

19.2.2.1. First Payment Request: The following items, if applicable, must be completed before District will accept and/or process Contractor's first payment request:

19.2.2.1.1. Installation of the Project sign;

19.2.2.1.2. Installation of field office;

19.2.2.1.3. Installation of temporary facilities and fencing;

19.2.2.1.4. Schedule of Values;

19.2.2.1.5. Contractor's Construction Schedule;

19.2.2.1.6. Schedule of unit prices, if applicable;

19.2.2.1.7. Submittal Schedule;

19.2.2.1.8. Receipt by Architect of all submittals due as of the date of the payment application;

19.2.2.1.9. Copies of necessary permits;

19.2.2.1.10. Copies of authorizations and licenses from governing authorities;

19.2.2.1.11. Initial progress report;

19.2.2.1.12. Surveyor qualifications;

19.2.2.1.13. Written acceptance of District's survey of rough grading, if applicable;

19.2.2.1.14. List of all Subcontractors, with names, license numbers, telephone numbers, and Scope of Work;

19.2.2.1.15. All bonds and insurance endorsements; and

19.2.2.1.16. Resumes of Contractor's project manager, and if applicable, job site secretary, record documents recorder, and job site superintendent.

19.2.2.2. Second Payment Request: District will not process the second payment request until and unless all submittals and Shop Drawings have been accepted for review by the Architect.

19.2.2.3. No Waiver of Criteria: Any payment made to Contractor where criteria set forth herein have not been met shall not constitute a waiver of said criteria by District. The approval of any Application for Progress Payment or the disbursement of any Progress Payment to the Contractor shall not be deemed nor constitute acceptance of defective Work or Work not in conformity with the Contract Documents. Instead, such payment shall be construed as a good faith effort by District to resolve differences so Contractor may pay its Subcontractors and suppliers. Contractor agrees that failure to submit such items may constitute a material breach of the Contract by Contractor and may subject Contractor to termination.

19.3. Progress Payments

19.3.1. District's Approval of Application for Payment

19.3.1.1. Upon receipt of an Application for Payment, District shall act in accordance with the following:

19.3.1.1.1. Each Application for Payment shall be reviewed by the District as soon as practicable after receipt for the purpose of determining that the Application for Payment is a proper Application for Payment.

19.3.1.1.2. Any Application for Payment determined not to be a proper Application for Payment suitable for payment shall be returned to the Contractor as soon as practicable, but not later than seven (7) days, after receipt. An Application for Payment returned pursuant to this paragraph shall be accompanied by a document setting forth in writing the reasons why the Application for Payment is not proper. The number of days available to the District to make a payment without being subject to any applicable statute regarding prompt payment or interest accrual, shall be reduced by the number of days by which the District exceeds this seven-day return requirement.

19.3.1.1.3. An approved Application for Payment shall be considered payable if funds are available for payment after the deduction of amounts allowed by law and/or pursuant to the section herein entitled "Decisions to Withhold Payment,"

19.3.1.2. The District's review of the Contractor's Application for Payment will be based

on the District's and the Architect's observations at the Site and the data comprising the Application for Payment that the Work has progressed to the point indicated and that, to the best of the District's and the Architect's knowledge, information, and belief, the quality of the Work is in accordance with the Contract Documents. The foregoing representations are subject to:

19.3.1.2.1. Observation of the Work for general conformance with the Contract Documents,

19.3.1.2.2. Results of subsequent tests and inspections,

19.3.1.2.3. Minor deviations from the Contract Documents correctable prior to Completion, and

19.3.1.2.4. Specific qualifications expressed by the Architect.

19.3.1.3. District's approval of each Application for Payment shall be based on Contractor complying with all requirements for a fully complete and valid Application for Payment.

19.3.2. Payments to Contractor

19.3.2.1. Within thirty (30) days after District's receipt of each undisputed and properly submitted Application for Payment, Contractor shall be paid a sum equal to ninety-five percent (95%) of the value of the Work performed (as verified by Architect and Inspector and certified by Contractor) up to the last day of the previous month, less the aggregate of previous payments and amount to be withheld. The value of the Work completed shall be Contractor's best estimate. No inaccuracy or error in Contractor's estimate shall operate to release the Contractor, or any Surety upon any bond, from damages arising from such Work, or from the District's right to enforce each and every provision of this Contract, and the District shall have the right subsequently to correct any error made in any estimate for payment.

19.3.2.2. District shall withhold five percent (5%) retention from all Progress Payments.

19.3.2.3. District may withhold ten percent (10%) retention from all Progress Payments pursuant to Public Contract Code section 7201, if the Project is determined to be "substantially complex."

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

19.3.2.5. In accordance with Public Contract Code §20104.50, in the event that the District shall fail to make any Progress Payment within thirty (30) days after receipt of an undisputed and properly submitted Application for Progress Payment, the District shall pay the Contractor interest on the undisputed amount of such Application for Progress Payment equal to the legal rate of interest set forth in California Code of Civil Procedure §685.010(a).

19.3.3. No Waiver

No payment by District hereunder shall be interpreted so as to imply that District has inspected, approved, or accepted any part of the Work. Notwithstanding any payment, the District may enforce each and every provision of this Contract. The District may correct or require correction of any error subsequent to any payment.

19.3.4. Warranty of Title

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

19.3.4.2. If the Contractor fails to furnish to the District within ten (10) calendar days after demand by the District, satisfactory evidence that a lien or a claim based on a stop notice or stop payment notice has been so released, discharged, or secured, the District may discharge such indebtedness and deduct the amount required therefore, together with any and all losses, costs, damages, and attorney's fees and expense incurred or suffered by District from any sum payable to Contractor pursuant to the Contract.

19.4. Decisions to Withhold Payment

19.4.1. Reasons to Withhold Payment

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

19.4.1.1. Defective Work not remedied within **FORTY-EIGHT (48)** hours of written notice to Contractor;

19.4.1.2. Stop notices, stop payment notices or other liens served upon the District as a result of the Contract;

19.4.1.3. Liquidated damages assessed against the Contractor;

19.4.1.4. The cost to complete the Work if there exists reasonable doubt that the Work can be completed for the unpaid balance of the Contract Price or by the Completion Date;

19.4.1.5. Damage to the District or other contractor(s);

19.4.1.6. Unsatisfactory performance of the Work by Contractor;

19.4.1.7. Failure to store and properly secure materials;

19.4.1.8. Failure of the Contractor to submit, on a timely basis, proper, sufficient, and acceptable documentation required by the Contract Documents, including, without limitation, a Construction Schedule, Schedule of Submittals, Schedule of Values, Monthly Progress Schedules, Shop Drawings, Product Data and samples, Proposed product lists, executed Change Orders, and/or verified reports;

19.4.1.9. Failure of the Contractor to maintain As-Built Drawings;

19.4.1.10. Erroneous estimates by the Contractor of the value of the Work performed, or other false statements in an Application for Payment;

19.4.1.11. Unauthorized deviations from the Contract Documents;

19.4.1.12. Failure of the Contractor to perform the Work in a timely manner in compliance with the Construction Schedule, established progress schedules, and/or completion dates;

19.4.1.13. If requested by the District, or the failure to provide to the DIR, certified payroll records acceptable to the District and the DIR for each journeyman, apprentice, worker, or other employee employed by the Contractor and/or each Subcontractor in connection with the Work for the period of the Application for Payment;

19.4.1.14. Failure to properly pay prevailing wages as defined in Labor Code sections 1720 et seq. and/or failure to comply with any other Labor Code requirements;

19.4.1.15. Failure to properly maintain or clean up the Site;

19.4.1.16. Failure to timely indemnify, defend or hold harmless the District;

19.4.1.17. Any payments due to the District, including but not limited to payments for failed tests, utilities changes, or permits;

19.4.1.18. Failure to pay Subcontractor(s) or supplier(s) as required by law and by the Contract Documents;

19.4.1.19. Failure to pay any royalty, license or similar fees;

19.4.1.20. Failure of the Contractor to submit on a timely basis all Closeout Documentation in a manner and form that is proper, sufficient, and reasonably acceptable to the District, and to not cause a delay in the Completion or approval of the Project; or

19.4.1.21. Failure to perform any implementation and/or monitoring required by any SWPPP for the Project and/or the imposition of any penalties or fines imposed therefore against Contractor or District.

19.4.1.22. Payment is delayed due to an audit inquiry by the State, the County Office of Education, the County, or any entity with jurisdiction related to the Project.

19.4.1.23. Contractor is otherwise in breach, default or in substantial violation of any provision of the Contract;

19.4.2. Reallocation of Withheld Amounts

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

19.4.2.2. If Contractor defaults or neglects to perform the Work in accordance with the Contract Documents or fails to perform any provision thereof, District may, after **FORTY-EIGHT (48)** hours written notice to the Contractor and, without prejudice to any other remedy, make good such deficiencies. District shall adjust the total Contract Price by reducing the amount thereof by the cost of making good such deficiencies. If District deems it inexpedient to correct Work that is damaged, defective, or not done in accordance with Contract provisions, an

equitable reduction in the Contract Price (of at least one hundred twenty-five percent (125%) of the estimated reasonable value of the nonconforming Work) shall be made therefor.

19.4.3. Payment After Cure

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

19.5. Subcontractor Payments

19.5.1. Payments to Subcontractors. No later than seven (7) days after receipt, or pursuant to Business and Professions Code section 7108.5 and Public Contract Code section 7107, 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. Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to its Sub-subcontractors in a similar manner.

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

19.5.3. Joint Checks. District shall have the right in its sole discretion, if necessary for the protection of the District, to issue joint checks made payable to the Contractor and Subcontractors and material or equipment suppliers. The joint check payees shall be responsible for the allocation and disbursement of funds included as part of any such joint payment. In no event shall any joint check payment be construed to create any contract between the District and a Subcontractor of any tier, any obligation from the District to such Subcontractor, or rights in such Subcontractor against the District.

20. COMPLETION OF THE WORK

20.1. Completion

20.1.1. The Project may only be accepted by action of the governing board of the District.

20.1.2. District shall accept the Project and may have a Notice of Completion recorded when Project Completion has been achieved in accordance with the Contract Documents and to the satisfaction of District. For purposes of the payment of Retention, Completion is defined in Public Contract Code section 7107. For purposes of the timely filing of Stop Payment Notices, Completion is defined in California Civil Code section 9200, et seq.

20.1.3. There is no "*substantial completion*" for this Project. Even so, the District, at its sole option, may accept the Project and record a Notice of Completion when Project Completion has been completed to the satisfaction of District, except for minor corrective items, as distinguished from incomplete items. If Contractor fails to complete all minor corrective items within thirty-five (35) days after the date of the District's acceptance of the Project, District shall withhold from the final payment one hundred fifty percent (150%) of an estimate of the amount sufficient to complete the corrective items, as determined by District, until the item(s) are completed.

20.1.4. At the end of the thirty-five (35) day period, if there are any items remaining to be corrected, District may elect to proceed as provided herein related to adjustments to Contract Price, and/or District's right to perform the Work of the Contractor.

20.2. Closeout Procedures

20.2.1. Punch List

Contractor shall notify the Architect when Contractor considers the Work complete. Upon notification, Architect will prepare a list of minor items to be completed or corrected ("Punch List"). Contractor and/or its Subcontractors shall proceed promptly to complete and correct items on the Punch List. Failure to include an item on Punch List does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

20.2.2. Closeout Requirements

20.2.2.1. Utility Connections

Buildings shall be connected to water, gas, sewer, and electric services, complete and ready for use. Service connections shall be made and existing services reconnected.

20.2.2.2. As-Built Drawings

20.2.2.2.1. In addition to its requirement to provide monthly As-Built Drawings to the District, the Contractor shall provide a final set of As-Built Drawings, sometimes referred to as "Record Drawings," showing all of the Work as actually constructed upon Completion of the Project as indicated in the Specifications.

20.2.2.2.2. Contractor is liable and responsible for any and all inaccuracies in the As-Built Drawings, even if inaccuracies become evident at a future date.

20.2.2.2.3. Upon Completion of the Work and as a condition precedent to approval of final payment, Contractor shall obtain the Inspector's approval of the final set of As-Built Drawings.

20.2.2.3. Operations & Maintenance Manuals: Contractor shall prepare all operation and maintenance manuals and date as indicated in the Specifications.

20.2.2.4. Closeout Documentation: Contractor shall provide all Closeout Documentation, which shall include the following, without limitation:

20.2.2.4.1. A full set of final As-Built Drawings, as further defined herein.

20.2.2.4.2. All Operations & Maintenance Manuals and information, as further defined herein.

20.2.2.4.3. All Warranties, as further defined herein.

20.2.2.4.4. Verified report(s) for all scope(s) of work (DSA 6-C, Rev 03/22/13, or more recent revision if available).

20.3. Final Inspection

20.3.1. Contractor shall comply with Punch List procedures as provided herein, and maintain the presence of Contractor's superintendent and project manager until the Punch List is complete to ensure proper and timely completion of the Punch List. Under no circumstances shall Contractor demobilize its forces prior to completion of the Punch List. Upon receipt of Contractor's written notice that all of the Punch List items have been fully completed and the Work is ready for final inspection and acceptance, Architect and Project Inspector will inspect the Work and shall submit to Contractor and District a final inspection report noting the Work, if any, required in order to complete in accordance with the Contract

Documents. Absent unusual circumstances, this report shall consist of the Punch List items not yet satisfactorily completed.

20.3.2. Upon Contractor's completion of all items on the Punch List and any other uncompleted portions of the Work, the Contractor shall notify the District and Architect, who shall again inspect such Work. If the Architect finds the Work complete and acceptable under the Contract Documents, the Architect will notify Contractor, who shall then jointly submit to the Architect and the District its final Application for Payment.

20.3.3. Final Inspection Requirements

20.3.3.1. Before calling for final inspection, Contractor shall determine that the following have been performed:

20.3.3.1.1. The Work has been completed.

20.3.3.1.2. All life safety items are completed and in working order.

20.3.3.1.3. Mechanical and electrical Work are complete and tested, fixtures are in place, connected, and ready for tryout.

20.3.3.1.4. Electrical circuits scheduled in panels and disconnect switches labeled.

20.3.3.1.5. Painting and special finishes complete.

20.3.3.1.6. Doors complete with hardware, cleaned of protective film, relieved of sticking or binding, and in working order.

20.3.3.1.7. Tops and bottoms of doors sealed.

20.3.3.1.8. Floors waxed and polished as specified.

20.3.3.1.9. Broken glass replaced and glass cleaned.

20.3.3.1.10. Grounds cleared of Contractor’s equipment, raked clean of debris, and trash removed from Site.

20.3.3.1.11. Work cleaned, free of stains, scratches, and other foreign matter, of damaged and broken material replaced.

20.3.3.1.12. Finished and decorative work shall have marks, dirt, and superfluous labels removed.

20.3.3.1.13. Final cleanup, as provided herein.

20.4. Costs of Multiple Inspections

More than two (2) requests of the District to make a final inspection shall be considered an additional service of District, Architect, Construction Manager, and/or Project Inspector, and all subsequent costs will be invoiced to Contractor and if funds are available, withheld from remaining payments.

20.5. Partial Occupancy or Use Prior to Completion

20.5.1. District's Rights to Occupancy. The District may occupy or use any completed or partially completed portion of the Work at any stage. Neither the District's Final Acceptance, the making of Final

Payment, any provision in Contract Documents, nor the use or occupancy of the Work, in whole or in part, by District shall constitute acceptance of Work not in accordance with the Contract Documents nor relieve the Contractor or the Contractor's Performance Bond Surety from liability with respect to any warranties or responsibility for faulty or defective Work or materials, equipment and workmanship incorporated therein. The District and the Contractor shall agree in writing to the responsibilities assigned to each of them for payments, security, maintenance, heat, utilities, damage to the Work, insurance, the period for correction of the Work, and the commencement of warranties required by the Contract Documents. Any dispute as to responsibilities shall be resolved pursuant to the Claims provisions herein, with the added provision that during the dispute process, the District shall have the right to occupy or use any portion of the Work that it needs or desires to use.

20.5.2. Inspection Prior to Occupancy or Use. Immediately prior to partial occupancy or use, the District, the Contractor, and the Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

20.5.3. No Waiver. Unless otherwise agreed upon, partial or entire occupancy or use of a portion or portions of the Work shall not constitute beneficial occupancy or acceptance of the Work not complying with the requirements of the Contract Documents.

21. FINAL PAYMENT AND RETENTION

21.1. Final Payment

21.1.1. Upon receipt and approval of a valid and final Application for Payment, the Architect will issue a final Certificate of Payment or similar document indicating Architect's agreement that the Project has reached Completion. The District shall thereupon jointly inspect the Work and either accept the Work as complete or notify the Architect and the Contractor in writing of reasons why the Work has not reached Completion to the satisfaction of the District.

21.1.2. Upon acceptance of the Work of the Contractor as having reached Completion to the satisfaction of the District (that, absent unusual circumstances, will occur when the Punch List items have been satisfactorily completed), the District may record a Notice of Completion with the County Recorder, and the Contractor shall, upon receipt of final payment from the District, pay all the amount(s) due to its Subcontractors.

21.2. Prerequisites for Final Payment

The following conditions must be fulfilled prior to Final Payment:

21.2.1. A full and final waiver or release of all stop notices and stop payment notices in connection with the Work shall be submitted by Contractor, including a release of stop notice or stop payment notice in recordable form, together with (to the extent permitted by law) a copy of the full and final release of all stop notice or stop payment notice rights.

21.2.2. A duly completed and executed conditional waiver and release upon final payment compliant with Civil Code section 8136 from each subcontractor of any tier and supplier to be paid from the current progress payment.

21.2.3. A duly completed and executed unconditional waiver and release upon final payment compliant with Civil Code section 8138 from each subcontractor of any tier and supplier that was paid from the previous progress payment.

21.2.4. Contractor shall have made all corrections to the Work that are required to remedy any defects therein, to obtain compliance with the Contract Documents or any requirements of applicable codes and

ordinances, or to fulfill any of the orders or directions of District required under the Contract Documents.

21.2.5. 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.

21.2.6. Contractor must have completed all requirements set forth under "Closeout Procedures," including, without limitation, submission of an approved set of complete As-Built Drawings.

21.2.7. Architect shall have issued its written approval that final payment can be made.

21.2.8. Contractor shall have delivered to the District all manuals and materials required by the Contract Documents.

21.2.9. Contractor shall have completed final clean up as provided herein.

21.3. Retention

21.3.1. The retention, less any amounts disputed by the District or that the District has the right to withhold pursuant to provisions herein, shall be paid:

21.3.1.1. After approval of the District by the Architect's Certificate of Payment;

21.3.1.2. After the satisfaction of the conditions set forth herein;

21.3.1.3. Within sixty (60) days after Completion;

21.3.1.4. No earlier than thirty-five (35) days of the recording of the Notice of Completion by District, if a Notice of Completion is recorded by the District.

21.3.2. No interest shall be paid on any retention, or on any amounts withheld due to a failure of the Contractor to perform, in accordance with the terms and conditions of the Contract Documents, except as provided to the contrary in any Escrow Agreement between the District and the Contractor pursuant to Public Contract Code section 22300.

21.4. Substitution of Securities

The District will permit the substitution of securities in accordance with the provisions of Public Contract Code section 22300.

21.5. Claims Asserted After Final Payment

Any lien, stop payment notice or other claim filed or asserted after the Contractor's acceptance of the Final Payment by any Subcontractor, of any tier, laborer, Material Supplier or others in connection with or for Work performed under the Contract Documents shall be the sole and exclusive responsibility of the Contractor pursuant to the indemnification obligations of the Contract Documents. In the event any lien, stop payment notice or other claim of any Subcontractor, Laborer, Material Supplier or others performing Work under the Contract Documents remain unsatisfied after Final Payment is made, Contractor shall refund to District all monies that the District may pay or be compelled to pay in discharging any lien, stop payment notice or other claim, including, without limitation all costs and reasonable attorneys' fees incurred by District in connection therewith.

22. UNCOVERING WORK, CORRECTION OF WORK AND RIGHT TO TAKEOVER WORK

22.1. Uncovering of Work

If a portion of the Work is covered without Project Inspector or Architect approval or not in compliance with the Contract Documents, it must, if required in writing by the District, the Project Inspector, or the Architect, be uncovered for the Project Inspector's or the Architect's observation and be replaced at the Contractor's expense without change in the Contract Price or Contract Time.

22.2. Rejection of Work

Prior to the District's Acceptance of the Work, any Work or materials or equipment forming a part of the Work or incorporated into the Work that is defective or not in conformity with the Contract Documents may be rejected by the District, the Architect or the Project Inspector and the Contractor shall correct all rejected Work without any adjustment to the Contract Price or the Contract Time, even if the Work, materials or equipment have been previously inspected by the Architect or the Project Inspector or even if they failed to observe the defective or non-conforming Work, materials or equipment.

22.3. Nonconforming Work

22.3.1. Contractor shall promptly remove from Premises all Work identified by District as failing to conform to the Contract Documents whether incorporated or not. Contractor shall promptly replace and re-execute its own Work to comply with the Contract Documents without additional expense to the District and shall bear the expense of making good all work of other contractors destroyed or damaged by any removal or replacement pursuant hereto and/or any delays to the District or other Contractors caused thereby.

22.3.2. If Contractor does not remove Work that District has identified as failing to conform to the Contract Documents within a reasonable time, not to exceed **FORTY-EIGHT (48)** hours, District may remove it and may store any material at Contractor's expense. If Contractor does not pay expense(s) of that removal within ten (10) days' time thereafter, District may, upon ten (10) days' written notice, sell any material at auction or at private sale and shall deduct all costs and expenses incurred by the District and/or District may withhold those amounts from payment(s) to Contractor.

22.4. Correction of Work

22.4.1. Correction of Rejected Work. Pursuant to the notice provisions herein, the Contractor shall promptly correct the Work rejected by the District, the Architect, or the Project Inspector as failing to conform to the requirements of the Contract Documents, whether observed before or after Completion and whether or not fabricated, installed, or completed. The Contractor shall bear costs of correcting the rejected Work, including additional testing, inspections, and compensation for the Inspector's or the Architect's services and expenses made necessary thereby.

22.4.2. One-Year Warranty Corrections. If, within one (1) year after the date of Completion of the Work or a designated portion thereof, or after the date for commencement of warranties established hereunder, or by the terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the District to do so. This period of one (1) year shall be extended with respect to portions of the Work first performed after Completion by the period of time between Completion and the actual performance of the Work. This obligation hereunder shall survive acceptance of the Work under the Contract and termination of the Contract. The District shall give such notice promptly after discovery of the condition.

22.5. District's Right to Takeover Work

22.5.1. If the Contractor should neglect to prosecute the Work properly or fail to perform any provisions of this Contract, the District, after **FORTY-EIGHT (48)** hours written notice to the Contractor, may, without prejudice to any other remedy it may have, make good such deficiencies and may deduct the cost thereof

from the payment then or thereafter due the Contractor.

22.5.2. If it is found at any time, before or after Completion of the Work, that Contractor has varied from the Drawings and/or Specifications, including, but not limited to, variation in material, quality, form, or finish, or in the amount or value of the materials and labor used, District may require at its option:

22.5.2.1. That all such improper Work be removed, remade or replaced, and all work disturbed by these changes be made good by Contractor at no additional cost to the District;

22.5.2.2. That the District deduct from any amount due Contractor the sum of money equivalent to the difference in value between the work performed and that called for by the Drawings and Specifications; or

22.5.2.3. That the District exercise any other remedy it may have at law or under the Contract Documents, including but not limited to the District hiring its own forces or another contractor to replace the Contractor's nonconforming Work, in which case the District shall either issue a deductive Change Order, a Unilateral Change Order, or invoice the Contractor for the cost of that work. Contractor shall pay any invoices within thirty (30) days of receipt of same or District may withhold those amounts from payment(s) to Contractor.

22.5.3. Acceptance of Defective or Non-Conforming Work. The District may, in its sole and exclusive discretion, elect to accept Work that is defective or that is not in accordance with the requirements of the Contract Documents, instead of requiring its removal and correction, in which case the Contract Price shall be reduced as appropriate and equitable.

23. TERMINATION AND SUSPENSION

23.1. District's Right to Terminate Contractor for Cause

23.1.1. Grounds for Termination. The District, in its sole discretion, may terminate the Contract and/or terminate the Contractor's right to perform the work of the Contract based upon the following:

23.1.1.1. Contractor refuses or fails to execute the Work or any separable part thereof with sufficient diligence as will ensure its completion within the time specified or any extension thereof, or

23.1.1.2. Contractor fails to complete said Work within the time specified or any extension thereof, or

23.1.1.3. Contractor persistently fails or refused to perform Work or provide material of sufficient quality as to be in compliance with Contract Documents; or

23.1.1.4. Contractor files a petition for relief as a debtor, or a petition is filed against the Contractor without its consent, and the petition not dismissed within sixty (60) days; or

23.1.1.5. Contractor makes a general assignment for the benefit of its creditors, or a receiver is appointed on account of its insolvency; or

23.1.1.6. Contractor persistently or repeatedly refuses fails, except in cases for which extension of time is provided, to supply enough properly skilled workers or proper materials to complete the Work in the time specified; or

23.1.1.7. Contractor fails to make prompt payment to Subcontractors, or for material, or for labor; or

23.1.1.8. Contractor persistently disregards laws, or ordinances, or instructions of District; or

23.1.1.9. Contractor fails to supply labor, including that of Subcontractors, that can work in harmony with all other elements of labor employed or to be employed on the Work; or

23.1.1.10. Contractor or its Subcontractor(s) is/are otherwise in breach, default, or in substantial violation of any provision of this Contract.

23.1.2. Notification of Termination

23.1.2.1. Upon the occurrence at District's sole determination of any of the above conditions, District may, without prejudice to any other right or remedy, serve written notice upon Contractor and its Surety of District's termination of this Contract and/or the Contractor's right to perform the work of the Contract. This notice will contain the reasons for termination. Unless, within three (3) days after the service of the notice, any and all condition(s) shall cease, and any and all violation(s) shall cease, or arrangement satisfactory to District for the correction of the condition(s) and/or violation(s) be made, this Contract and/or the Contractor's right to perform the Work shall cease and terminate. Upon termination, Contractor shall not be entitled to receive any further payment until the entire Work is finished.

23.1.2.2. Upon termination, District may immediately serve written notice of tender upon Surety whereby Surety shall have the right to takeover and perform this Contract only if Surety:

23.1.2.2.1. Within three (3) days after service upon it of the notice of tender, gives District written notice of Surety's intention to takeover and perform this Contract; and

23.1.2.2.2. Commences performance of the Contract within seven (7) days from date of serving of its notice to District.

23.1.2.3. If Surety fails to notify District or begin performance as indicated herein, District may take over the Work and execute the Work to completion by any method it may deem advisable at the expense of Contractor and/or its Surety. Contractor and/or its Surety shall be liable to District for any excess cost or other damages the District incurs thereby. Time is of the essence in the Contract. If the District takes over the Work as herein provided, District may, without liability for so doing, take possession of and utilize in completing the Work such materials, appliances, plan, and other property belonging to Contractor as may be on the Site of the Work, in bonded storage, or previously paid for.

23.1.2.4. **Conversion to Termination for Convenience.** In the event the Contract is terminated under this "District's Right to Terminate Contractor for Cause" section and it is finally determined by an arbitrator, court, jury or other tribunal having jurisdiction, for any reason, that the Contractor was not in default under the provisions hereof or that the District's exercise of its rights under this section was defective, deficient, ineffective, invalid or improper for any reason, the termination shall be deemed a termination for convenience of the District under the "Termination of Contractor for Convenience" section herein and thereupon, the rights and obligations of the District and the Contractor shall be determined in accordance with the "Termination of Contractor for Convenience" section herein.

23.1.3. Effect of Termination

23.1.3.1. Contractor shall, only if ordered to do so by the District, immediately remove from the Site all or any materials and personal property belonging to Contractor that have not

been incorporated in the construction of the Work, or which are not in place in the Work. District retains the right, but not the obligation, to keep and use any materials and personal property belonging to Contractor that have not been incorporated in the construction of the Work, or which are not in place in the Work. Contractor and its Surety shall be liable upon the performance bond for all damages caused the District by reason of the Contractor's failure to complete the Contract.

23.1.3.2. In the event that the District shall perform any portion of, or the whole of the Work, pursuant to the provisions of the General Conditions, the District shall not be liable nor account to the Contractor in any way for the time within which, or the manner in which, the Work is performed by the District or for any changes the District may make in the Work or for the money expended by the District in satisfying claims and/or suits and/or other obligations in connection with the Work.

23.1.3.3. In the event that the Contract is terminated for any reason, no allowances or compensation will be granted for the loss of any anticipated profit by the Contractor or any impact or impairment of Contractor's bonding capacity.

23.1.3.4. If the expense to the District to finish the Work exceeds the unpaid Contract Price, Contractor and Surety shall pay difference to District within twenty-one (21) days of District's request.

23.1.3.5. **Assignment and Assumption of Subcontracts**. District shall have the right (but shall have no obligation) to assume and/or assign to a general contractor or construction manager or other third party who is qualified and has sufficient resources to complete the Work, the rights of the Contractor under its subcontracts with any or all Subcontractors. In the event of an assumption or assignment by the District, no Subcontractor shall have any claim against the District or third party for Work performed by Subcontractor or other matters arising prior to termination of the Contract. The District or any third party, as the case may be, shall be liable only for obligations to the Subcontractor arising after assumption or assignment. Should the District so elect, the Contractor shall execute and deliver all documents and take all steps, including the legal assignment of its contractual rights, as the District may require, for the purpose of fully vesting in the District the rights and benefits of it Subcontractor under Subcontracts or other obligations or commitments. All payments due the Contractor hereunder shall be subject to a right of offset by the District for expenses and damages suffered by the District as a result of any default, acts, or omissions of the Contractor. Contractor must include this assignment provision in all of its contracts with its Subcontractors.

23.1.3.6. The foregoing provisions are in addition to and not in limitation of any other rights or remedies available to District.

23.2. **Emergency Termination of Public Contracts Act of 1949**

23.2.1. The Contract is subject to termination as provided by sections 4410 and 4411 of the Government Code of the State of California, being a portion of the Emergency Termination of Public Contracts Act of 1949.

23.2.1.1. Section 4410 of the Government Code states:

> In the event a national emergency occurs, and public work, being performed by contract, is stopped, directly or indirectly, because of the freezing or diversion of materials, equipment or labor, as the result of an order or a proclamation of the President of the United States, or of an order of any federal authority, and the circumstances or conditions are such that it is impracticable within a reasonable time to proceed with a substantial portion of the work,

then the public agency and the contractor may, by written agreement, terminate said contract.

23.2.1.2. Section 4411 of the Government Code states:

Such an agreement shall include the terms and conditions of the termination of the contract and provision for the payment of compensation or money, if any, which either party shall pay to the other or any other person, under the facts and circumstances in the case.

23.2.2. Compensation to the Contractor shall be determined at the sole discretion of District on the basis of the reasonable value of the Work done, including preparatory work. As an exception to the foregoing and at the District's discretion, in the case of any fully completed separate item or portion of the Work for which there is a separate previously submitted unit price or item on the accepted Schedule of Values, that price shall control. District, in its sole discretion, may adopt the Contract Price as the reasonable value of the Work performed or any portion thereof.

23.3. Termination of Contractor for Convenience

23.3.1. District in its sole discretion may terminate the Contract upon three (3) days written notice to the Contractor. Under a termination for convenience, the District retains the right to all the options available to the District if there is a termination for cause. In case of a termination for convenience, Contractor shall have no claims against the District except:

23.3.1.1. The actual cost for labor, materials, and services performed that is unpaid and can be documented through timesheets, invoices, receipts, or otherwise, and

23.3.1.2. Five percent (5%) of the total cost of work performed as of the date of termination, or five percent (5%) of the value of the Work yet to be performed, whichever is less. This five percent (5%) amount shall be full compensation for all Contractor's and its Subcontractor(s)' mobilization and/or demobilization costs and any anticipated loss profits resulting from termination of the Contractor for convenience.

23.4. Suspension of Work

23.4.1. District may, without cause, order Contractor in writing to suspend, delay or interrupt the Project in whole or in part for such period of time as District may determine. When the District resumes the Project, the Parties will attempt to negotiate an adjustment in the Contract Price for increases or decreases in the cost of performance of the Project caused by suspense, delay or interruption. If the Parties cannot agree on an adjusted Contract Price, the District may terminate the Contract as permitted herein.

23.4.2. In the event the District shall order suspension of the Work, an adjustment shall be made to the Contract Price for increases in the direct cost of performance of the Work of the Contract Documents, actually caused by suspension, delay or interruption ordered by the District; provided however that no adjustment of the Contract Price shall be made to the extent: (i) that performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Contractor is responsible under the Contract Documents; or (ii) that an equitable adjustment is made or denied under another provision of the Contract Documents. The foregoing notwithstanding, any adjustment of the Contract Price shall not include any adjustment to increase the Contractor's overhead, general administrative costs or profit, all of which will remain as reflected in the Schedule of Values submitted by the Contractor pursuant to the Contract Documents. In the event of the District's suspension of the Work, the Contract Time shall be equitably adjusted.

23.5. Scope Reduction

In cases of suspension, partial or complete termination, or at the discretion of the District, the District reserves the right to unilaterally approve a deductive Change Order to reduce scope of work or perform work with other forces or its own forces.

24. CLAIMS RESOLUTION

24.1. Exclusive Remedy.

24.1.1. Compliance with the claim resolution process and timelines described in this Claims Resolution section as well as the notice provisions of the Contract are express conditions precedent to Contractor's right to commence litigation or arbitration, file a claim under the California Government Code, or commence any other legal action related to the Project ("Claims Resolution Process").

24.1.2. Contractor acknowledges that its failure, for any reason, to provide written notice and all required supporting documentation to permit the District's review and evaluation within the time frame required by this Claims Resolution Process, shall be deemed Contractor's waiver, release, discharge and relinquishment of any right to assert, request, or demand any entitlement to an adjustment of the Contract Time or the contract Price on account of any instruction, request, drawings, specifications, action, condition, omission, default or other situation.

24.1.3. To the extent any provision(s) of this Claims Resolution Process conflict with or otherwise impair the timeframes and procedures of Public Contract Code section 9204, the provisions of Section 9204 shall control. If provisions of this Claims Resolution Process are supplementary and/or in addition to the requirements of Section 9204, but do not conflict with or otherwise impair the timeframes and procedures of Section 9204, the provisions of this Claims Resolution Process and the Contract shall control.

24.2. Performance during Claim Resolution Process.

The Contractor shall diligently proceed with Work on the Project at the same time that Claims are addressed under the Claims Resolution Process. It is the intent of District to resolve Claims with the Contractor as close to the events giving rise to the Claims as possible, and to avoid stale or late Claims and the late documenting of Claims. Contractor's failure to diligently proceed in accordance with the District's instructions or the Contract terms will be considered a material breach of the Contract and a waiver of Contractor's rights under this Contract.

24.3. Waiver.

If Contractor fails to timely submit any written notices required under the terms of the Contract or in this Claims Resolution section, Contractor waives and releases its rights regarding further review of its Claim, unless Contractor and District mutually agree in writing to other time limits.

24.4. Intention.

The Claims Resolution Process required herein is intended to provide a concise mechanism for resolving Claims as they arise during the Project, while requiring accurate documentation related to contested issues as to those Claims that are not contemporaneously resolved.

24.5. Other Provisions.

If portions of the Contract, other than this Claims Resolution Process, establish a specific process regarding a specific subject, then that process shall govern and control the resolutions of any disagreements thereunder. Otherwise, the provisions in this Claims Resolution Process shall control the resolution of all Claims.

24.6. Claim Presentation

24.6.1. Claim: A claim is a written demand by Contractor (or by Contractor on behalf of a Subcontractor) that the Contractor must submit by **registered mail or certified mail return receipt requested** for:

24.6.1.1. An extension to the Contract Time, including relief from damages or penalties assessed by the District for delay;

24.6.1.2. Payment of money or damages arising from work done by, or on behalf of, the Contractor pursuant to the Contract and payment that is not otherwise expressly provided for in the Contract Documents or the Contractor is not otherwise entitled; or

24.6.1.3. Payment that is disputed by the District.

("**Claim**")

24.6.2. A PCO may be a Claim, but the Parties agree that a PCO shall only be a Claim if:

24.6.2.1. The District states in writing that it disagrees with the terms of a PCO and directs the Contractor to utilize the Claim Resolution Process, or

24.6.2.2. The District rejects in whole or in part a PCO and the Contractor states in writing that it is utilizing the Claim Resolution Process for the portion of the PCO that the District rejected.

24.6.3. Subcontractor Claims.

24.6.3.1. Public Contract Code section 9204(d)(5) states that the Contractor may present to the District a Claim on behalf of a Subcontractor or lower tier Subcontractor. A Subcontractor may request in writing, either on his or her own behalf or on behalf of a lower tier Subcontractor, that the Contractor present a claim for Work which was performed by the Subcontractor or by a lower tier Subcontractor on behalf of the Subcontractor. The Subcontractor requesting that the Claim be presented to the District shall furnish reasonable documentation to support the Claim. Within 45 days of receipt of this written request, the Contractor shall notify the Subcontractor in writing as to whether the Contractor presented the claim to the District and, if the Contractor did not present the Claim, provide the Subcontractor with a statement of the reasons for not having done so.

24.6.3.2. Contractor is responsible for providing this Claims Resolution Process to its Subcontractors and for ensuring that all Subcontractors or others who may assert Claims by and through Subcontractors and/or the Contractor are informed of this Claims Resolution Process. No Claim submitted by any party that fails to follow the provisions of this Claims Resolution Process will be considered. Contractor shall indemnify, keep and hold harmless the District and its consultants, against all suits, claims, damages, losses, and expenses, including but not limited to attorney's fees, caused by, arising out of, resulting from, or incidental to, the failure to provide this Claims Resolution Process to its Subcontractors or others who may assert Claims by and through Subcontractors and/or the Contractor.

24.6.4. Contractor Must Timely Identify, Present and Document Any Claim

24.6.4.1. Every Claim shall be stated with specificity in writing and signed by Contractor under penalty of perjury and presented to the District within ten (10) calendar days from the date Contractor discovers or reasonably should discover, that an act, error or omission of District, its agents or employees, or action, condition or other situation has occurred that may entitle

Contractor to make a Claim. This shall include the Contractor's actual or constructive knowledge of any instruction, request, drawings, specifications, action, condition, omission, default or other situation for which the contractor believes there should an adjustment of the Contract Price or Contract Time. Contractor shall provide this writing even if Contractor has not yet been damaged, delayed, or incurred extra cost when Contractor discovers, or reasonably should discover, the act, error, omission, action, condition or situation giving rise to the incidents giving rise to the Claim. The writing shall:

24.6.4.1.1. Identify all of the issues, events, conditions, circumstances and/or causes giving rise to the Claim;

24.6.4.1.2. Identify all pertinent dates and/or durations and all actual and/or anticipated effects on the Contract Price, milestones and/or Contract Time adjustments; and

24.6.4.1.3. Identify in detail line-item costs if the Claim seeks money.

24.6.4.1.4. If the Claim involves extra work, a detailed cost breakdown of the amounts the Contractor is seeking, including actual cost records (including without limitation, payroll records, material and rental invoices and the like) demonstrating that those costs have actually been incurred. To the extent costs have not yet been incurred at the time the Claim is submitted, actual cost records must be submitted on a current basis not less than once a week during any periods costs are incurred. A cost record will be considered current if submitted within seven (7) days of the date the cost reflected in the record is incurred. At the request of District, extra costs may be subject to further verification procedures (such as having an inspector verify the performance of alleged extra work on a daily basis).

24.6.4.1.5. If the Claim involves an error or omission in the Contract Documents:

24.6.4.1.5.1. An affirmative representation under penalty of perjury by Contractor and any affected Subcontractors and suppliers that the error or omission was not discovered prior to submitting a proposal for the Work, and

24.6.4.1.5.2. A detailed statement demonstrating that the error or omission reasonably should not have been discovered, by Contractor, its Subcontractors and suppliers, prior to submitting a proposal for the Work.

24.6.4.1.6. If the Claim involves a request for additional compensation for escalation of materials costs, then this provision exclusively governs those request(s) by Contractor and the following are **all** conditions precedent to Contractor's submission of a Change Order Request or Claim for additional compensation for escalation of materials costs.

24.6.4.1.6.1. Contractor shall not be entitled to submit a request for compensation for escalation of materials unless the actual increase in the cost of the materials in question exceeds ten percent (10%) of the **total** material costs on the Project at the time of bid.

24.6.4.1.6.2. The cost escalation is the result of unusual and unforeseeable market conditions not reasonably foreseeable at the time of award of the Contract and was not an escalated cost resulting from any action or inaction of the Contractor.

24.6.4.1.6.3. Contractor timely ordered and/or purchased the materials at issue, based on (1) Contractor's constructive knowledge of the supply chain for required materials and (2) Contractor's request to utilize the provisions in the Contract Documents related to the District's payment for materials and equipment purchased

and stored on Site or offsite.

24.6.4.1.6.4. Contractor's material costs were reasonable at the time of Contractor's bid for the Project.

24.6.4.1.6.5. Contractor demonstrates an actual increase in the cost of materials in its Contract Price at the time of award of the Contract and/or as reflected in Contractor's escrowed bid documents compared to Contractor's actual material payment cost paid either at time of purchase or delivery, whichever is earlier.

24.6.4.1.6.6. An actual year-to-date price increase has occurred and can be substantiated by the E.N.R. 20-City Average Material Cost Index for the material at issue that demonstrates the claim for an increase in price of the material at the time of delivery of the higher priced material to the Project.

24.6.4.2. The writing shall be accompanied by all documents substantiating Contractor's position regarding the Claim.

24.6.4.3. A Claim that asserts an effect on any schedule milestones and/or Contract Time shall include all pertinent scheduling data demonstrating the impact(s) on the critical path(s), milestone(s) and/or Contract Time.

24.6.4.4. Contractor agrees that it shall not base its damages, its calculations or its Claim on a "total cost" approach, a "modified total cost" approach or a "jury verdict method" approach.

24.6.5. Certification. Each copy of the Claim Documentation shall be certified by a responsible officer of the Contractor in accordance with the requirements of the Contract Documents. This certification shall be under penalty of perjury and must include the following language immediately above or before the Contractor's signature: "***I declare under penalty of perjury under the laws of the State of California that the information provided and statements made in this Claim are true and correct, substantiated and of merit***." The Contractor acknowledges that this requirement is not a mere formality but is intended to ensure that the Contractor only submits Claims that it believes are true and correct, substantiated and have merit. Should Contractor fail to submit the foregoing written statement signed under penalty of perjury, Contractor waives and releases its Claim, including all rights and remedies in connection therewith. This certification must include a certification of any portion of the Claim from Subcontractor(s) or others who are asserting Claims by and through Subcontractors and/or the Contractor

24.6.6. District's Written Statement/Decision on Claim. The District shall issue a written statement/decision regarding the Claim to the Contractor within forty-five (45) days of receipt of the written Claim from the Contractor, or three (3) days after the District's first regular governing board meeting after that 45-day period if the District's governing board does not meet within that first 45-day period. If the District fails to timely provide a written statement/decision regarding the Claim, the Claim shall be deemed rejected in its entirety.

24.6.7. Contractor Must Demand an Informal Meet and Confer Conference if Contractor Pursues Any Claim

24.6.7.1. FAILURE OF A CONTRACTOR TO TIMELY DEMAND A MEET AND CONFER CONFERENCE IS A WAIVER OF ITS RIGHT TO PURSUE ALL OR A PORTION OF ITS CLAIM.

24.6.7.2. Where There Is No Agreement: If there is no agreement between Contractor and the District on a Claim, then within ten (10) calendar days of the date of the District's written statement/decision in response to a Claim or PCO, if Contractor pursues that Claim, then

Contractor must demand, by **registered mail or certified mail return receipt requested,** a meet and confer conference with District staff. A meet and confer conference with District staff shall be a condition precedent to Contractor seeking any further relief, including a mediation as indicated below.

24.6.7.3. Where There Is Partial Agreement: If Contractor and the District partially agree on a Claim but do not reach complete agreement, then the Parties shall complete a Change Order, if applicable, for the issues and/or amounts agreed to. For those issues not agreed to, if Contractor pursues those issues from that Claim, then Contractor must demand, by **registered mail or certified mail return receipt requested,** a meet and confer conference with District staff regarding those issues. A meet and confer conference with District staff shall be a condition precedent to Contractor seeking any further relief, including a mediation as indicated below, in connection with the District's rejection.

24.6.7.4. Meet and Confer Conference. District and Contractor shall schedule the meet and confer conference as soon as reasonably possible after Contractor's written demand for a meet and confer conference, but in no case later than thirty (30) days after Contractor's demand.

24.6.7.5. District's Written Decision. Within ten (10) **business** days of the meet and confer conference, the District shall issue a written decision. If the District fails to timely provide a written statement/decision after the meet and confer conference, all Claim issues that were part of the meet and confer conference shall be deemed rejected in their entirety.

24.6.7.5.1. If the District's decision completely resolves the Claim, then the Parties shall complete a Change Order, if applicable, for the issues and/or amounts agreed to.

24.6.7.5.2. If the District rejects the Contractor's Claim in whole or in part or does not issue a timely written response, then the parties shall mediate the remaining issues of the Claim.

24.6.7.5.3. Contractor's costs incurred in seeking relief for Claims are not recoverable from District.

24.6.8. Mediation.

24.6.8.1. At the District's sole discretion, this mediation may be a multiple-party mediation with the Architect, the Construction Manager, the Inspector, and/or other District consultants.

24.6.8.2. The District and Contractor shall mutually agree to a mediator within ten (10) **business** days after the disputed portion of the Claim has been identified in writing. If the parties cannot agree upon a mediator, each party shall select a mediator and those mediators shall select a qualified neutral third party to mediate with regard to the disputed portion of the Claim. Each party shall bear the fees and costs charged by its respective mediator in connection with the selection of the neutral mediator.

24.6.9. Contractor's Obligation to File a Government Code Claim. Nothing in this Contract, including this Claims Resolution Process, waives, modifies or tolls the Contractor's obligation to present a timely claim under Government Code section 910, et seq. Therefore, in addition to complying with this Claims Resolution Process, the Contractor is required to present claims to the District pursuant to Government Code section 910, et seq. If after the requirements of this Claims Resolution Process are satisfied, and all or a portion of the Claim remains unresolved, and if the Government Code claim is rejected by the District, the Contractor may proceed under the post-mediation provisions of this Claims Resolution Process.

24.6.10. Post Mediation Provisions

24.6.10.1. Claims of $375,000 or Less: The provisions of Public Contract Code § 20104.4 shall apply. Pursuant to Public Contract Code § 20104.4(a), within sixty (60) days, but no earlier than thirty (30) days, following the filing of responsive pleadings, the court shall submit the matter to nonbinding mediation unless waived by mutual stipulation of both parties. Pursuant to Public Contract Code § 9204(d)(2)(D), a mediation conducted pursuant to this Claims Resolution Process shall excuse the obligation under Public Contract Code § 20104.4(a) to mediate after litigation has been commenced unless otherwise agreed to by the parties in writing.

24.6.10.2. Litigation of Claims in Excess of $375,000. If, after a mediation as indicated above, the Parties have not resolved the Claim, either Party may commence an action in a court of competent jurisdiction to contest that decision within ninety (90) days following the conclusion of that mediation or one (1) year following the accrual of the cause of action, whichever is later. By mutual agreement, the Parties can agree to instead resolve the Claim through arbitration.

24.6.11. The District shall be entitled to remedy any false claims, as defined in California Government Code section 12650 *et seq*., made to the District by the Contractor or any Subcontractor under the standards set forth in Government Code section 12650 *et seq*. Any Contractor or Subcontractor who submits a false claim shall be liable to the District for three times the amount of damages that the District sustains because of the false claim. A Contractor or Subcontractor who submits a false claim shall also be liable to the District for (a) the costs, including attorney fees, of a civil action brought to recover any of those penalties or damages, and (b) a civil penalty of up to $11,000 for each false claim. In addition, Contractor may be subject to criminal prosecution under California Penal Code §72 and/or civil liability under False Claims Act. If so, the District may be entitled to recover its costs incurred to investigate any False Claim, including but not limited to attorneys' fees and expert fees incurred in connection with that investigation.

24.7. Documentation of Resolution.

If a Claim is resolved, the District shall determine if that resolution shall be documented in an Agreement and Release of Any and All Claims form or other document, as appropriate.

24.8. Claim Resolution Process – Non-Applicability.

The procedures and provisions in this Claims Resolution section shall **not** apply to:

24.8.1. District's determination of what Work is or will be constructed, or whether the Work complies with the Contract Documents for purposes of accepting the Work;

24.8.2. District's rights and obligations as a public entity, such as, but without limitation, the revocation of prequalified or qualified status, barring a contractor from District contracts, the imposition of penalties or forfeitures prescribed by statute or regulation; provided, however, that penalties imposed against a public entity by statutes such as Public Contract Code section 7107, shall be subject to the mandatory dispute resolution provisions of this Claims Resolution section and the Contract;

24.8.3. Personal injury, wrongful death or property damage claims;

24.8.4. Latent defect or breach of warranty or guarantee to repair;

24.8.5. Stop notices or stop payment notices; or

24.8.6. Any other District rights as set forth herein.

24.9. The District's failure to respond to a Claim from the Contractor within the time periods described herein or to otherwise meet the time requirements of Public Contract Code section 9204 shall automatically result in the Claim being deemed rejected in its entirety, with no admission by the District as to the merits of the Claim.

24.10. If District fails to timely issue payment for any Claim or portion of a Claim as required pursuant to these Claim Resolution Procedures, the Contractor is permitted to assess interest indicated in Public Contract Code section 9204. Notwithstanding this provision, and in accordance with Public Contract Code section 7107, the District is entitled to withhold up to 150% of disputed amounts and the District shall not be liable for payment of interest on such disputed amounts pending final adjudication of such disputes.

25. LABOR, WAGE & HOUR, APPRENTICE AND RELATED PROVISIONS

25.1. Contractor & Subcontractor Registration

25.1.1. Contractor shall comply with the registration and compliance monitoring provisions of Labor Code section 1771.4, including furnishing its CPRs to the Labor Commissioner of California and complying with any applicable enforcement by the Department of Industrial Relations. Labor Code section 1771.1(a) states the following:

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

25.1.2. Contractor acknowledges that, for purposes of Labor Code section 1725.5, all or some of the Work is a public work to which Labor Code section 1771 applies. Contractor shall comply with Labor Code section 1725.5, including without limitation the registration requirements. Additionally, all Contractor's Subcontractors shall comply with Labor Code section 1725.5 to be qualified to bid on, be listed in a bid proposal, subject to the requirements of Section 4104 of the Public Contract Code, or engage in the performance of the Contract. Contractor represents that all of its Subcontractors are registered pursuant to Labor Code section 1725.5.

25.1.3. The Project is subject to compliance monitoring and enforcement by the Department of Industrial Relations. Contractor shall post job site notices, as prescribed by regulation. Contractor shall comply with all requirements of Labor Code section 1771.4, except the requirements that are exempted by the Labor Commissioner for the Project.

25.2. Wage Rates, Travel and Subsistence

25.2.1. Pursuant to the provisions of article 2 (commencing at section 1770), chapter 1, part 7, division 2, of the Labor Code of California, 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 to execute this Contract are on file at the District's principal office and copies will be made available to any interested party on request and are available to any interested party on request or at **www.dir.ca.gov/oprl/statistics_and_databases.html**.. Contractor shall obtain and post a copy of these wage rates at the job site.

25.2.2. Holiday and overtime work, when permitted by law, shall be paid for at a rate of at least one and one-half times the above specified rate of per diem wages, unless otherwise specified. The holidays upon

which those rates shall be paid need not be specified by the District, but shall be all holidays recognized in the applicable collective bargaining agreement. If the prevailing rate is not based on a collectively bargained rate, the holidays upon which the prevailing rate shall be paid shall be as provided in Section 6700 of the Government Code.

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

25.2.4. If during the period this bid is required to remain open, the Director determines that there has been a change in any prevailing rate of per diem wages in the locality in which the Work under the Contract is to be performed, such change shall not alter the wage rates in the Invitation to Bid or the Contract subsequently awarded.

25.2.5. Pursuant to Labor Code section 1775, Contractor shall, as a penalty to District, forfeit the statutory amount, (currently not to exceed two hundred dollars ($200) for each calendar day, or portion thereof), for each worker paid less than the prevailing rates, as determined by the District and/or the Director, for the work or craft in which that worker is employed for any public work done under Contract by Contractor or by any Subcontractor under it.

25.2.5.1. The amount of the penalty shall not be less than forty dollars ($40) for each calendar day, or portion thereof, unless the failure of Contractor was a good faith mistake and, if so, the error was promptly and voluntarily corrected when brought to the attention of Contractor.

25.2.5.2. The amount of the penalty shall not be less than eighty dollars ($80) for each calendar day or portion thereof, if Contractor has been assessed penalties within the previous three (3) years for failing to meet Contractor's prevailing wage obligations on a separate contract, unless those penalties were subsequently withdrawn or overturned.

25.2.5.3. The amount of the penalty may not be less than one hundred twenty dollars ($120) for each calendar day, or portion thereof, if the Labor Commissioner determines the Contractor willfully violated Labor Code section 1775.

25.2.5.4. The difference between such 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 prevailing wage rate, shall be paid to each worker by Contractor.

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

25.2.7. Pursuant to Labor Code section 1773.1, per diem wages are deemed to include employer payments for health and welfare, pension, vacation, travel time, subsistence pay, and apprenticeship or other training programs authorized by section 3093, and similar purposes.

25.2.8. Contractor shall post at appropriate conspicuous points on the Site of Project, a schedule showing all determined minimum wage rates and all authorized deductions, if any, from unpaid wages actually earned. In addition, Contractor shall post a sign-in log for all workers and visitors to the Site, a list of all subcontractors of any tier on the Site, and the required Equal Employment Opportunity poster(s).

25.3. Hours of Work

25.3.1. As provided in article 3 (commencing at section 1810), chapter 1, part 7, division 2, of the Labor Code, eight (8) hours of labor shall constitute a legal days work. The time of service of any worker employed at any time by 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 shall be limited and restricted by Contractor to eight (8) hours per day, and forty (40) hours during any one week, except as hereinafter provided. Notwithstanding the provisions hereinabove set forth, Work performed by employees of Contractor in excess of eight (8) hours per day and forty (40) hours during any one week, shall be permitted upon this public work upon compensation for all hours worked in excess of eight (8) hours per day at not less than one and one-half times the basic rate of pay.

25.3.2. Contractor shall keep and shall cause each Subcontractor to keep an accurate record showing the name of and actual hours worked each calendar day and each calendar week by each worker employed by Contractor in connection with the Work or any part of the Work contemplated by this Contract. The record shall be kept open at all reasonable hours to the inspection of District and to the Division of Labor Standards Enforcement of the DIR.

25.3.3. Pursuant to Labor Code section 1813, Contractor shall as a penalty to the District forfeit the statutory amount (believed by the District to be currently twenty five dollars ($25)) for each worker employed in the execution of this Contract by 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 one calendar day and forty (40) hours in any one calendar week in violation of the provisions of article 3 (commencing at section 1810), chapter 1, part 7, division 2, of the Labor Code.

25.3.4. Any Work necessary to be performed after regular working hours, or on Sundays or other holidays shall be performed without additional expense to the District.

25.4. Payroll Records

25.4.1. Contractor and all Subcontractors must comply with the compliance monitoring provisions of Labor Code section 1771.4, including furnishing its certified payroll records ("CPR(s)") to the Labor Commissioner of California and complying with any applicable enforcement by DIR. Labor Code section 1771.4 requires Contractor and Subcontractors to provide electronic copies of CPRs to the Labor Commissioner of California at least once every thirty (30) days, and within thirty (30) days of Project Completion. The failure to timely provide the CPRs could result in penalties as determined by Labor Code section 1771.4, applicable laws, and regulations

25.4.2. If requested by the District, Contractor shall provide to the District and shall cause each Subcontractor performing any portion of the Work to provide the District and an accurate CPR(s), showing the name, address, social security number, work classification, straight time, and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker, or other employee employed by the Contractor and/or each Subcontractor in connection with the Work.

25.4.3. In addition to any other requirements pursuant to Labor Code sections 1770, et seq., the CPRs enumerated hereunder shall be certified and shall be provided to the District on a weekly basis. The CPRs from the Contractor and each Subcontractor for each week shall be provided on or before Wednesday of the week following the week covered by the CPRs. District shall not make any payment to Contractor until:

25.4.3.1. Contractor and/or its Subcontractor(s) provide CPRs acceptable to the District, and

25.4.3.2. The District is given sufficient time to review and/or audit the CPRs to

determine their acceptability. Any delay in Contractor and/or its Subcontractor(s) providing CPRs to the District in a timely manner will directly delay the District's review and/or audit of the CPRs and Contractor's payment.

25.4.4. All CPRs shall be available for inspection at all reasonable hours at the principal office of Contractor on the following basis:

25.4.4.1. A certified copy of an employee's CPR shall be made available for inspection or furnished to the employee or the employee's authorized representative on request.

25.4.4.2. CPRs shall be made available for inspection or furnished upon request to a representative of District, Division of Labor Standards Enforcement, Division of Apprenticeship Standards, and/or the Department of Industrial Relations.

25.4.4.3. CPRs shall be made available upon request by the public for inspection or copies thereof made; provided, however, that a request by the public shall be made through either the District, Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement. If the requested CPRs have not been provided pursuant to the provisions herein, the requesting party shall, prior to being provided the records reimburse the costs of preparation by Contractor, Subcontractors, and the entity through which the request was made. The public shall not be given access to the records at the principal office of Contractor.

25.4.5. The form of certification for the CPRs shall be as follows:

I, _____ (Name-Print), the undersigned, am the _____ _____ (Position in business) with the authority to act for and on behalf of _____ _____ (Name of business and/or Contractor), certify under penalty of perjury that the records or copies thereof submitted and consisting of _____ (Description, number of pages) are the originals or true, full, and correct copies of the originals which depict the payroll record(s) of actual disbursements by way of cash, check, or whatever form to the individual or individual named, and (b) we have complied with the requirements of sections 1771, 1811, and 1815 of the Labor Code for any work performed by our employees on the Project.

Date: _____ Signature: _____
(Section 16401 of Title 8 of the California Code of Regulations)

25.4.6. Each Contractor shall file a certified copy of the CPRs with the entity that requested the records within ten (10) days after receipt of a written request.

25.4.7. Any copy of records made available for inspection as copies and furnished upon request to the public or any public agency by District, Division of Apprenticeship Standards, or Division of Labor Standards Enforcement shall be marked or obliterated in such a manner as to prevent disclosure of an individual's name, address, and social security number. The name and address of Contractor awarded Contract or performing Contract shall not be marked or obliterated.

25.4.8. Contractor shall inform District of the location of the records enumerated hereunder, including the street address, city, and county, and shall, within five (5) Business Days, provide a notice of change of location and address.

25.4.9. In the event of noncompliance with the requirements of this section, Contractor shall have ten (10) days in which to comply subsequent to receipt of written notice specifying in what respects Contractor must comply with this section. Should noncompliance still be evident after the ten (10) day period, Contractor shall, as a penalty to District, forfeit one hundred dollars ($100) for each calendar day,

or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of Division of Apprenticeship Standards or Division of Labor Standards Enforcement, these penalties shall be withheld from progress payments then due.

25.4.10. It shall be the responsibility of Contractor to ensure compliance with the provisions of Labor Code section 1776.

25.5. Apprentices

25.5.1. Contractor acknowledges and agrees that, if this Contract involves a dollar amount greater than or a number of working days greater than that specified in Labor Code section 1777.5, then this Contract is governed by the provisions of Labor Code Section 1777.5. It shall be the responsibility of Contractor to ensure compliance with this Article and with Labor Code section 1777.5 for all apprenticeship occupations.

25.5.2. Apprentices of any crafts or trades may be employed and, when required by Labor Code section 1777.5, shall be employed provided they are properly registered in full compliance with the provisions of the Labor Code.

25.5.3. Every apprentice shall be paid the standard wage paid to apprentices under the regulations of the craft or trade at which the apprentice is employed, and shall be employed only at the work of the craft or trade to which the apprentice is registered.

25.5.4. Only apprentices, as defined in section 3077 of the Labor Code, who are in training under apprenticeship standards and written apprentice agreements under chapter 4 (commencing at section 3070), division 3, of the Labor Code, are eligible to be employed. The employment and training of each apprentice shall be in accordance with the provisions of the apprenticeship standards and apprentice agreements under which the apprentice is training.

25.5.5. Pursuant to Labor Code section 1777.5, if that section applies to this Contract as indicated above, Contractor and any Subcontractors employing workers in any apprenticeable craft or trade in performing any Work under this Contract shall apply to the applicable joint apprenticeship committee for a certificate approving the Contractor or Subcontractor under the applicable apprenticeship standards and fixing the ratio of apprentices to journeymen employed in performing the Work.

25.5.6. Pursuant to Labor Code section 1777.5, if that section applies to this Contract as indicated above, Contractor and any Subcontractor may be required to make contributions to the apprenticeship program.

25.5.7. If Contractor or Subcontractor willfully fails to comply with Labor Code section 1777.5, then, upon a determination of noncompliance by the Administrator of Apprenticeship, it shall:

25.5.7.1. Be denied the right to bid on any subsequent project for one (1) year from the date of such determination;

25.5.7.2. Forfeit as a penalty to District the full amount as stated in Labor Code section 1777.7. Interpretation and enforcement of these provisions shall be in accordance with the rules and procedures of the California Apprenticeship Council and under the authority of the Chief of the Division of Apprenticeship Standards.

25.5.8. Contractor and all Subcontractors shall comply with Labor Code section 1777.6, which section forbids certain discriminatory practices in the employment of apprentices.

25.5.9. Contractor shall become fully acquainted with the law regarding apprentices prior to commencement of the Work. Special attention is directed to sections 1777.5, 1777.6, and 1777.7 of the

Labor Code, and title 8, California Code of Regulations, section 200 et seq. Questions may be directed to the State Division of Apprenticeship Standards, 455 Golden Gate Avenue, San Francisco, California 94102.

25.5.10. Contractor shall ensure compliance with all certification requirements for all workers on the Project including, without limitation, the requirements for electrician certification in Labor Code sections 108, et seq.

25.6. Non-Discrimination

25.6.1. Contractor herein agrees not to discriminate in its recruiting, hiring, promotion, demotion, or termination practices on the basis of race, religious creed, national origin, ancestry, sex, age, or physical handicap in the performance of this Contract and to comply with the provisions of the California Fair Employment and Housing Act as set forth in part 2.8 of division 3 of the California Government Code, commencing at section 12900; the Federal Civil Rights Act of 1964, as set forth in Public Law 88-352, and all amendments thereto; Executive Order 11246, and all administrative rules and regulations found to be applicable to Contractor and Subcontractor.

25.6.2. Special requirements for Federally Assisted Construction Contracts: During the performance of this Contract, Contractor agrees to incorporate in all subcontracts the provisions set forth in Chapter 60-1.4(b) of Title 41 published in Volume 33 No. 104 of the Federal Register dated May 28, 1968.

25.7. Labor First Aid

Contractor shall maintain emergency first aid treatment for Contractor's workers on the Project which complies with the Federal Occupational Safety and Health Act of 1970 (29 U.S.C. § 651 et seq.) the California Occupational Safety and Health Act of 1973, and all related regulations, including without limitation section 330 et seq. of Title 8 of the California Code of Regulations.

26. MISCELLANEOUS

26.1. Assignment of Antitrust Actions

26.1.1. Section 7103.5(b) of the Public Contract Code states:

> In entering into a public works contract or subcontract to supply goods, services, or materials pursuant to a public works contract, the Contractor or subcontractor offers and agrees to assign to the awarding body 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. Sec. 15) or under the Cartwright Act (Chapter 2 (commending with Section 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, made and become effective at the time the awarding body tenders final payment to the Contractor, without further acknowledgment by the parties.

26.1.2. Section 4552 of the Government Code states:

> In submitting a bid to a public purchasing body, the bidder offers and agrees that if the bid is accepted, it will assign to the purchasing body 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. Sec. 15) or under the Cartwright Act (Chapter 2 (commencing with Section 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, materials, or services by the bidder for sale to the purchasing body pursuant to the bid. Such assignment shall be made and become effective at the time the purchasing body tenders final payment to the bidder.

26.1.3. Section 4553 of the Government Code states:

If an awarding body or public purchasing body receives, either through judgment or settlement, a monetary recovery for a cause of action assigned under this chapter, the assignor shall be entitled to receive reimbursement for actual legal costs incurred and may, upon demand, recover from the public body any portion of the recovery, including treble damages, attributable to overcharges that were paid by the assignor but were not paid by the public body as part of the bid price, less the expenses incurred in obtaining that portion of the recovery.

26.1.4. Section 4554 of the Government Code states:

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

26.1.5. Under this Article, "public purchasing body" is District and "bidder" is Contractor.

26.2. Excise Taxes

If, under Federal Excise Tax Law, any transaction hereunder constitutes a sale on which a Federal Excise Tax is imposed and the sale is exempt from such Federal Excise Tax because it is a sale to a State or Local Government for its exclusive use, District, upon request, will execute documents necessary to show (1) that District is a political subdivision of the State for the purposes of such exemption, and (2) that the sale is for the exclusive use of District. No Federal Excise Tax for such materials shall be included in any Contract Price.

26.3. Taxes

Contract Price is to include any and all applicable sales taxes or other taxes that may be due in accordance with section 7051 of the Revenue and Taxation Code; Regulation 1521 of the State Board of Equalization or any other tax code that may be applicable.

26.4. Shipments

All shipments must be F.O.B. destination to Site or sites, as indicated in the Contract Documents. There must be no charge for containers, packing, unpacking, drayage, or insurance. The total Contract Price shall be all inclusive (including sales tax) and no additional costs of any type will be considered.

26.5. Compliance with Government Reporting Requirements

If this Contract is subject to federal or other governmental reporting requirements because of federal or other governmental financing in whole or in part for the Project which it is part, or for any other reason, Contactor shall comply with those reporting requirements at the request of the District at no additional cost.

END OF DOCUMENT

DOCUMENT 00 71 00

SPECIAL CONDITIONS

1. **Project Description**

Removal of existing lunch wood trellis and replacement with new PC approved metal shade structure. Addition of (1) new playground area with new play equipment and PC approved fabric shade structure. Addition of (1) walking track with new PC approved fabric shade structure. Remodel of (1) women's restroom in Building A.

a. **Scope**.

(1) The Project is to remove one existing lunch wood trellis and replace it with new PC approved metal shade structure.
(2) Addition of (1) new playground area with new play equipment and PC approved fabric shade structure.
(3) Addition of (1) walking track with new PC approved fabric shade structure.
(4) Removal of (1) women's restroom in Building A.

b. **Preliminary (Tentative) Schedule**. These dates are subject to change, at the District's discretion.

(1) The District anticipates awarding the Project, if it awards it at all, at its Board meeting in December 17, 2026.
(2) Based on this, the District expects Project Completion in February 19, 2027.

2. **Prequalification**

All bidders are required to have been prequalified by the District. In addition, if the Project has electrical, mechanical, or plumbing components that will be performed by subcontractors performing under the following license classification(s), then each of those subcontractors that intend to bid as a first-tier subcontractor to a general contractor (prime contractor) are required to have been prequalified by the District: C-4, C-7, C-10, C-16, C-20, C-34, C-36, C-38, C-42, C-43, and/or C-46. The following Subcontractors have been prequalified by the District: **[LIST ALL THAT HAVE PREQUALIFIED]**

- **Mechanical Subcontractors**
  _____, _____, CA; CSLB No. _____
  _____, _____, CA; CSLB No. _____

- **Electrical Subcontractors**
  _____, _____, CA; CSLB No. _____
  _____, _____, CA; CSLB No. _____

- **Plumbing Subcontractors**
  _____, _____, CA; CSLB No. _____
  _____, _____, CA; CSLB No. _____

3. **Mitigation Measures**

Contractor shall comply will all applicable mitigation measures, if any, adopted by any public agency with respect to this Project pursuant to the California Environmental Quality Act. (Public Resources Code section 21000 et. seq.) [**INCLUDE THE FOLLOWING IF APPLICABLE:]** The District's Mitigation Monitoring Plan is not a Contract Document, but is referenced and available as indicated in the Existing Information and Documentation Regarding Project Site.

4. **Site Specific Conditions**

a. **Access**. Access to the school buildings and entry to buildings, classrooms, restrooms, mechanical rooms, electrical rooms, or other rooms, for construction purposes, must be coordinated with District and onsite District personnel before Contractor commences Work. Unless agreed to otherwise in writing, only a school custodian will be allowed to unlock and lock doors in existing building(s). The custodian will be available only while school is in session. If a custodian is required to arrive before 7:00 a.m. or leave after 3:30 p.m. to accommodate Contractor's Work, the overtime wages for the custodian will be paid by Contractor, unless, at the discretion of District, other arrangements are made in advance.

b. **Master Key**. Upon request, District may, at its own discretion, provide a master key to the school site for the convenience of Contractor. Contractor agrees to pay all expenses to re-key the entire school site and all other affected District buildings if the master key is lost or stolen or if any unauthorized party obtains a copy of the key or access to the school.

c. **Maintaining Services**. Contractor is advised that Work is to be performed in spaces regularly scheduled for instruction. Interruption and/or periods of shutdown of public access, electrical service, water service, lighting, or other utilities shall be only as arranged in advance with District. Contractor shall provide temporary services to all facilities interrupted by Contractor's Work.

d. **Maintaining Utilities**. Contractor shall maintain in operation during term of Contract, drainage lines, storm drains, sewers, water, gas, electrical, steam, and other utility service lines within working area.

e. **Work During Instructional Time**. By submitting its bid, Contractor affirms that Work may be performed during ongoing instruction in existing facilities. If so, Contractor agrees to cooperate to the best of its ability to minimize any disruption to the school up to, and including, rescheduling specific work activities, at no additional cost to District.

f. **No Work During Student Testing**. Contractor shall, at no additional cost to District and at District's request, coordinate its Work to not disturb District students including, without limitation, not performing any Work when students at the Site are taking State-required tests.

g. **Badge and Vest Policy for Contractors**. Contractor shall provide their workers and all of Subcontractors' workers, and delivery personnel or others entering the Site, with identification badges and a brightly colored construction vest. These badges and vests shall be worn by all persons who are working on the Project Site.

(1) Badges must be filled out in full and contain the following information:

a) Name of Contractor
b) Name of Employee
c) Contractor's address and phone number

(2) Badges must be worn by all these persons when on Site and must be visible at all times. Contractors must inform these persons that they are required to allow District employees, the Architect, the Construction Manager, the Program Manager, or the Project Inspector to review the information on the badges upon request to, without limitation, confirm a person's identity and a person's right to be on Site, and in any particular area on the Site, at any time.

(3) Failure to display an identification badge and/or to wear a vest as required by this policy may result in the assessment of fines against the Contractor.

5. **Fingerprinting**

[THE CRIMINAL BACKGROUND INVESTIGATION / FINGERPRINTING CERTIFICATION (DOC. 00 45 85) ALLOWS THE CONTRACTOR TO DETERMINE WHICH METHOD THE CONTRACTOR WILL UTILIZE TO COMPLY WITH THE FINGERPRINTING REQUIREMENT. IF THE DISTRICT WANTS TO DIRECT THE CONTRACTOR TO UTILIZE ONLY A SPECIFIC METHOD, THE DISTRICT MUST CHECK THE APPROPRIATE BOX BELOW.]

The Contractor must comply with the Criminal Background Investigation / Fingerprinting Certification (Doc. 00 45 85) by utilizing only the following method indicated (checked) and not any other method.

☐ **All Workers Fingerprinted.** The Contractor has complied with the fingerprinting requirements of Education Code section 45125.1 with respect to all Contractor's employees and all of its subcontractors' employees who interact with pupils, outside of the immediate supervision and control of the pupil's parent or guardian or a school employee, has a valid criminal record summary as described in Education Code Section 44237 (Contractor shall "require each applicant for employment in a position requiring contact with minor pupils to submit two sets of fingerprints prepared for submittal by the employer to the Department of Justice for the purpose of obtaining criminal record summary information from the Department of Justice and the Federal Bureau of Investigation."). A complete and accurate list of Contractor's employees and of all of its subcontractors' employees who may interact with District pupils during the course and scope of the Contract is attached hereto; and/or

☒ **Physical Barrier.** Pursuant to Education Code section 45125.2, Contractor has installed or will install, prior to commencement of work, a physical barrier at the Project site, that will limit contact between Contractor's employees and District pupils at all times; and/or

☒ **Continual Supervision by Fingerprinted Employee.** Pursuant to Education Code section 45125.2, Contractor certifies that all employees will be under the continual supervision of, and monitored by, an employee of the Contractor who the California Department of Justice has ascertained has not been convicted of a violent or serious felony. The name and title of the employee who will be supervising Contractor's employees and its subcontractors' employees is:

Name: _____ **Title:** _____

☐ **Unoccupied Site.** The Work on the Contract is at an unoccupied school site and no employee and/or subcontractor or supplier of any tier of Contract shall come in contact with the District pupils.

6. **Substitutions for Specified Items**

Requests for substitutions after award of the Contract shall be submitted within **THIRTY FIVE (35)** days of the date of the Notice of Award. This time period may be extended by the District only, in its sole discretion.

7. **Weather Days**

Delays due to Adverse Weather conditions will only be permitted in compliance with the provisions in the General Conditions and only if the number of days of Adverse Weather exceeds the following parameters:

NORTHERN CALIFORNIA: 60 Days
SOUTHERN CALIFORNIA: 40 Days

8. **Insurance Policy Limits**. Contractor's insurance shall be with insurance companies with an A.M. Best rating of no less than _____ [**E.G. A: IX, MODIFY RATING OF CARRIER, AS DESIRED.]** The limits of insurance shall not be less than:

[MODIFY THIS PROVISION (WHICH IS IN THE GENERAL CONDITIONS) IF NEEDED]

Commercial General Liability	Includes: Bodily Injury, Property Damage, Personal & Advertising Injury, Product Liability and Completed Operations	$2,000,000 each occurrence; $4,000,000 general aggregate
Automobile Liability – Any Auto	Combined Single Limit	$2,000,000 per occurrence
Excess Liability (Umbrella)		$6,000,000 per occurrence; $6,000,000 aggregate
Workers Compensation		Statutory limits pursuant to State law
Employers' Liability		$2,000, 000 each incident, each disease; $2,000,000 policy limit
Sexual Abuse & Molestation		$1,000,000 each incident; $2,000,000 policy limit
Builder's Risk (Course of Construction)		Issued for the value and scope of Work indicated herein.
Property of Others	Combined Single Limit General Aggregate	Issued for the value and scope of Work stored off-site.

a. **Builder's Risk Insurance: Builder's Risk "All Risk" Insurance (WITH Earthquake and Flood).**

[**THIS PROVISION ADDS EARTHQUAKE AND FLOOD COVERAGES, WHICH CAN BE VERY EXPENSIVE AND MANY PROJECTS DO NOT INCLUDE THIS COVERAGE.**

(1) Contractor (Builder) shall procure and maintain, during the life of the Project, Contractor's Builder's Risk (Course of Construction), or similar first party property coverage acceptable to the District, issued on a replacement cost value basis. The cost shall be consistent with the total replacement cost of all insurable Work of the Project included within the Contract Documents.

(2) Coverage is to insure against all risks of accidental physical loss and shall include without limitation the perils of vandalism and/or malicious mischief (both without any limitation regarding vacancy or occupancy), sprinkler leakage, civil authority, sonic disturbance, **earthquake, flood**, collapse, wind, fire, lightning, and smoke. Coverage shall include debris removal, demolition, increased costs due to enforcement of all applicable ordinances and/or laws in the repair and replacement of damaged and undamaged portions of the property, and reasonable costs for the Architect's and engineering services and expenses required as a result of any insured loss upon the Work and Project, including completed Work and Work in progress, to the full insurable value thereof.

(3) Coverage shall be maintained until final payment has been made as provided under the Contract or until no person or entity other than the District has an insurable interest in the property to be covered, whichever is later. This insurance shall cover as insureds the District, Contractor, all Subcontractors of every tier on the Project, and all vendors and suppliers. Coverage must also be maintained for any materials stored offsite that will be incorporated into the Project.

(4) The deductible for this insurance shall be paid by Contractor.

b. **Contractor's Pollution Liability Coverage**: [**REQUIRED FOR ANY SCOPES INVOLVING ABATEMENT OF LEAD, ASBESTOS, OR HAZARDOUS MATERIALS OR HAZARDOUS ENVIRONMENTAL CONDITIONS THAT**

COULD ARISE BECAUSE OF CONSTRUCTION OPERATIONS]The Contractor will procure and maintain contractor's pollution liability insurance, providing limits of $1,000,000 per occurrence and $5,000,000 the aggregate, on an occurrence form. The policy shall cover all activities and operations during construction at the Project Site. The policy must cover mold during the period of construction and throughout the statute of repose**.**

c. **Aircraft Liability**: [**REQUIRED FOR ANY SCOPES WHERE THEY CONTRACTOR OR ANY OF ITS SUBCONTRACTORS MAY BE UTILIZING A DRONE DURING THE PERFORMANCE OF THEIR WORK UNDER THEIR CONTRACT**.] If the Contractor or its Subcontractor(s) will be using unmanned aircraft during construction operations, Contractor must either have its commercial general liability and excess liability policies endorsed to provide coverage for unmanned aircraft operations or procure and maintain a separate aircraft liability policy to cover unmanned aircraft operations. Required minimum liability limits are $1,000,000.

9. **Permits, Certificates, Licenses, Fees, Approval**

a. **Approvals, Certificates, Fees, Inspections, Licenses, Permits, Etc.**

(1) **Permits in Bid Price**. Contractor shall include in its Bid the cost of any approvals, certificates, fees, excavations, licenses, permits or similar requirements necessary for the performance of the Work ("Permits").

a) "Permits" includes, without limitation, any of the following if required: temporary or permanent building, mechanical, electrical or plumbing permits; certificates of occupancy; curb-breaking permits, highway entrance permits; water permits; etc.

b) "Permits" does not include Project Inspector fees (which will be paid by the District unless otherwise indicated herein), professional licensing, or contractors' licensing.

c) The Contractor shall be required to obtain all Permits. The Contractor shall ensure sufficient time in its Construction Schedule to secure and obtain all permits and shall not be permitted to claim a delay in the Project due to a delay in obtaining a Permit.

b. **Certain Fees Not Part of Permits.** Notwithstanding the above requirements, District shall oversee the obtaining and payment of the following permits, fees or charges, but Contractor shall assist in those efforts as requested by the District at no additional cost to District:

c. **Storm Water Permits**

(1) Contractor shall perform the Work of the Project related to being District's Qualified SWPPP (Storm Water Pollution Prevention Plan) Practitioner ("QSP").

(2) As District's QSP, Contractor shall be responsible for storm water and non-storm water visual observations, sampling, and analysis per the District's SWPPP.

(3) Contractor shall strictly follow the requirements to implement all the provisions of the SWPPP including, without limitation, preparation of monitoring and recording reports and providing those to District.

(4) Contractor's indemnity obligations are applicable to any damages, penalties, fees, charges, or related expenses assessed or charged to the District by any water boards or agencies with jurisdiction related to compliance with the Storm Water Permits.

10. **Project Inspection**

In addition to the requirements in the Contract Documents related to cooperation with and authority of the DSA Project Inspector(s) for the Project, Contractor must comply with the requirements of the most recent versions of DSA document PR 13-01. Below are provisions of this document from PR 13-01 (rev 08/21/17).

(1) The contractor shall carefully study the DSA-approved documents and shall plan a schedule of operations well ahead of time.

(2) If at any time it is discovered that work is being done which is not in accordance with the DSA-approved construction documents, the contractor shall correct the work immediately.

(3) Verify that DSA 152 and, when applicable, DSA 152-IPI forms were issued for the project prior to the commencement of construction.

(4) Meet with the design team, the Laboratory of Record and the Project Inspector(s) to mutually communicate and understand the structural/material and fire/life safety testing and inspection program, and the methods of communication appropriate for the project.

(5) Notify the Project Inspector(s) and, when applicable, in-plant inspector, in writing, of the commencement of construction of each and every aspect of the work at least 48 hours in advance by submitting Commencement/Completion of Work Notification (form DSA 156), or other agreed-upon written documents, to the Project Inspector(s).

(6) Notify the Project Inspector(s) and, when applicable, the in-plant inspector, of the completion of construction of each and every aspect of the work by submitting form DSA 156 (or other agreed-upon written documents) to the Project Inspector(s).

(7) Consider the relationship of the signed-off blocks and sections of the form DSA 152 and the commencement of subsequent work. Until the Project Inspector(s) has signed off applicable blocks and sections of the form DSA 152, the contractor may be prohibited from proceeding with subsequent construction activities that cover up the unapproved work. Any subsequent construction activities that cover up the unapproved work will be subject to a "Stop Work Order" from DSA or the school district (see IR A-13 for additional information), and are subject to removal and remediation if found to be in noncompliance with the DSA-approved construction documents.

(8) Submit the final verified report. All prime contractors are required to submit final Contractor Verified Reports (form DSA 6-C).

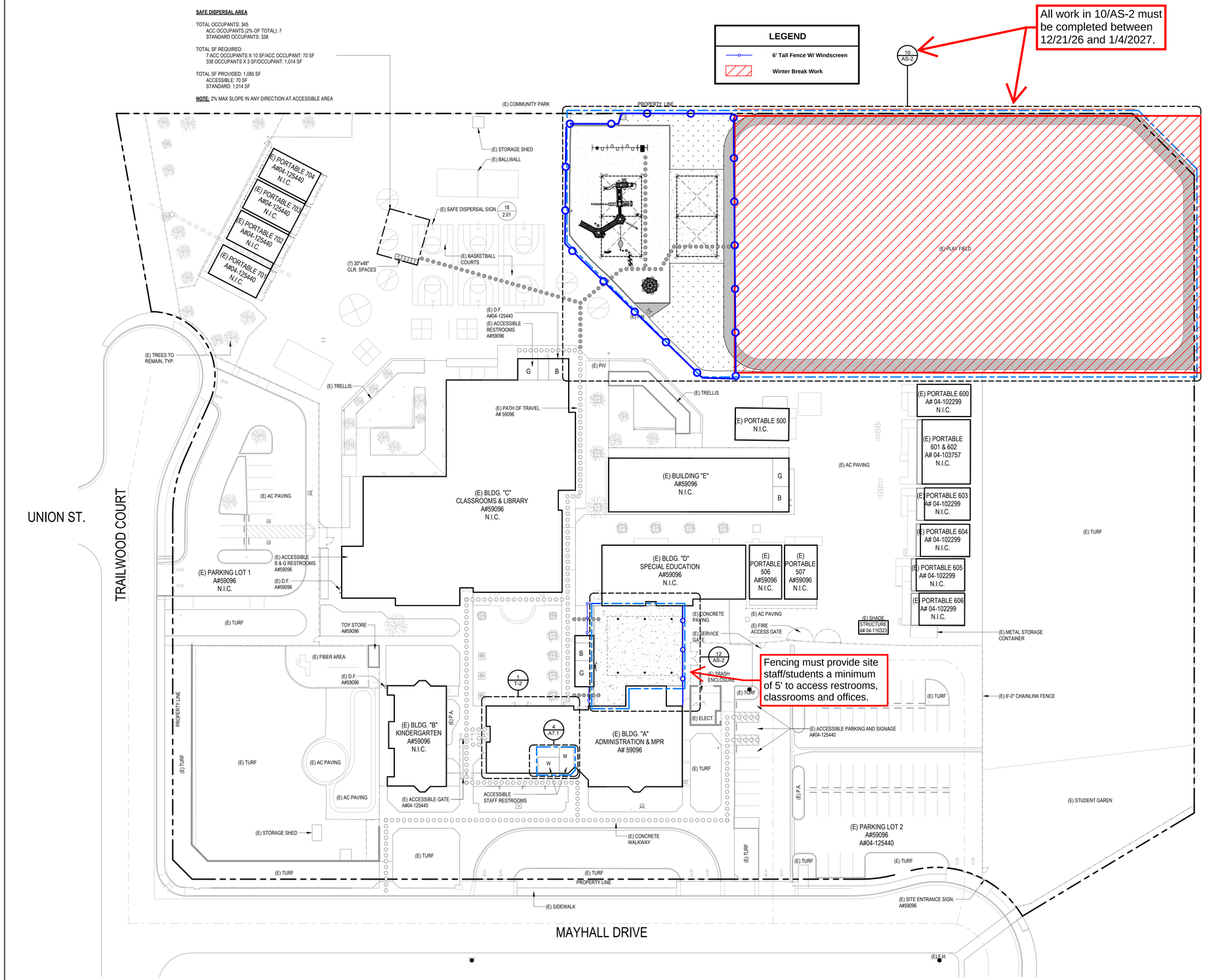
11. **Health & Safety.** This provision includes additional requirements related to the Contractor's responsibility related to the health of its workers and to the procedures it must follow related to any infectious disease or virus (e.g., COVID-19 or derivative strain, etc.), and is in addition to the requirements already indicated in the Contract Documents including, without limitation, in the Agreement and the General Conditions.
12. **Temporary Fencing.** Bidder shall install, maintain, relocate as needed, and perform the final removal of all temporary fencing. Fencing shall be in place within five (5) days of Notice to Proceed and shall remain until project completion, or as directed for removal by the CONSTRUCTION MANAGER. Temporary Fencing shall be 6' wind screening with pre-cut wind screen holes. Any damaged wind screen shall be replaced by the contractor at no additional cost to the Owner within the duration of the construction project. All fencing requires windscreens to limit visibility and limit possible distraction for students. There shall be no limit of fence moves, nor any cost to the District to move the fence as needed or requested. All fencing must meet minimum aesthetic requirements to meet surrounding Housing Development standards. Contractor shall refer to Construction Staging/Logistics Plan for locations of approximate fencing. Contractor to field verify measurements associated with the provided logistics plan, windscreens to be attached to the existing fencing.
13. **Portable Toilet Service and Trash Receptacles.** Bidder is responsible for the adequate provisions and service

of portable sanitary facilities for the entire duration of the project. Number of portable toilets and hand wash stations will comply with OSHA regulations and shall be distributed appropriately across the site at least two locations. This Bidder is responsible to provide four (4) thirty (30) gallon trash receptacles. Trash receptacles shall be emptied weekly and coordinate locations with Construction Manager.

14. **Trash Dumpsters.** Bidder shall provide a forty (40) Cubic Yard Dumpster along with providing a minimum of ten (10) dumpster haul-offs or as many needed for all construction related debris/trash throughout the duration of the project. Provide a line item for this in the schedule of value as unused haul-offs will be credited back to LEUSD.
15. **Final Clean-Up.** Bidder is responsible for the Final Cleaning of the job site. Prior to completion of the work, remove from the job site all tools, surplus materials, equipment, scrap, debris and waste and conduct final progress cleaning as described above. Work will be completed using a trained crew to water down, scrub, air blow and/or pressure wash as needed to remove all debris. Clean at the discretion of the Construction Manager. Remove any resultant debris. Schedule the final cleaning with the Construction Manager to enable the Owner to accept completely clean project.

END OF DOCUMENT

Exhibit 1: Fencing Plan



GENERAL NOTES

1. LOCATIONS OF ALL UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR SHALL EXERCISE EXTREME CAUTION IN EXCAVATING AND TRENCHING TO AVOID INTERCEPTING EXISTING PIPING OR CONDUITS. THE ARCHITECT IS NOT RESPONSIBLE FOR THE LOCATION OF UNDERGROUND UTILITIES OR STRUCTURES WHETHER OR NOT SHOWN OR DETAILED AND INSTALLED BY OTHER CONTRACTS. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER SHOULD SUCH UNIDENTIFIED CONDITIONS BE DISCOVERED. THESE DRAWINGS DO NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY.
2. VERIFY ALL EXISTING AND FINISH GRADES, DIMENSIONS AND SITE CONDITIONS BEFORE COMMENCING WORK AND REPORT ANY DISCREPANCIES TO THE ARCHITECT.

LEGEND

- (E) PATH OF TRAVEL, A#59096, A#04-125440
- PATH OF TRAVEL

1. **DESIGN PROFESSIONAL IN GENERAL RESPONSIBLE CHARGE STATEMENT:** THE PATH OF TRAVEL (P.O.T.) IDENTIFIED IN THESE CONSTRUCTION DOCUMENTS MEETS THE REQUIREMENTS OF THE CURRENT EDITION OF THE 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 P.O.T. WAS EXAMINED AND ANY ELEMENTS, COMPONENTS OR PORTIONS OF THE P.O.T. 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 NON-COMPLIANT ELEMENTS, COMPONENTS OR PORTIONS OF THE P.O.T. 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 P.O.T. ITEMS WITHIN SCOPE OF THE PROJECT REPRESENTED AS CBC COMPLIANT ARE FOUND TO BE NON-CONFORMING BEYOND CONVENTIONAL INDUSTRY TOLERANCES, THE ITEMS SHALL BE BROUGHT INTO COMPLIANCE WITH THE CBC AS PART OF THIS PROJECT BY MEANS OF A CONSTRUCTION CHANGE DOCUMENT.
2. THE ACCESSIBLE PATH OF TRAVEL AS INDICATED ON PLAN IS A BARRIER FREE ACCESS ROUTE WITHOUT ANY ABRUPT LEVEL CHANGES EXCEEDING 1/2" BEVELED AT 1:2 MAX SLOPE OR VERTICAL LEVEL CHANGE NOT EXCEEDING 1/4" MAX AND AT LEAST 48" WIDE. SURFACE IS SLIP RESISTANT, STABLE, FIRM AND SMOOTH. CROSS SLOPE DOES NOT EXCEED 2% AND SLOPE IN THE DIRECTION OF TRAVEL IS LESS THAN 5% UNLESS OTHERWISE INDICATED.
3. CONTRACTOR TO VERIFY THAT ALL BARRIERS IN THE PATH OF TRAVEL HAVE BEEN REMOVED OR WILL BE REMOVED UNDER THIS PROJECT, AND PATH OF TRAVEL COMPLIES WITH CBC 11338. VERIFY ALL EXISTING AND FINISH GRADES, DIMENSIONS AND SITE CONDITIONS BEFORE COMMENCING WORK AND REPORT ANY DISCREPANCIES TO THE ARCHITECT.

- (E) PROPERTY LINE
- LIMIT OF WORK
- (E) BUILDING(S) NOT PART OF THIS CONTRACT
- AC PAVING, SEE CIVIL DRAWINGS
- CONCRETE PAVING, SEE CIVIL DRAWINGS
- ARTIFICIAL TURF, SEE CIVIL DRAWINGS
- (E) TREE, PROTECT IN PLACE

SHADE CALCULATIONS

SURAFCE PARKING AREA: N/A (EXISTING PARKING TO REMAIN)

HARDSCAPE AREA: 16,246 SF (NEW HARDSCAPE AREA) x 20% = 3,249 SF (REQUIRED SHADE AREA)
PROVIDED: 4,264 SF *5.106.12.3 EXCEPTION 1
NOTE: METAL SHADE STRUCTURE ROOFING MATERIALS COMPLY WITH TABLE A5.106.11.2.2, ROOF SLOPE ≤2:12

LANDSCAPE AREA: N/A (NEW DESIGNATED PLAY AREA) *5.106.12.2 EXCEPTION

PARKING TABULATION

(E) PARKING LOT 2

EXISTING PARKING SPACES:	57 SPACES TOTAL
ACCESSIBLE PARKING SPACES REQUIRED (CBC 11B-208.2):	3 SPACES TOTAL
VAN ACCESSIBLE PARKING SPACES REQUIRED (CBC 11B-208.2.4):	1 SPACE
ACCESSIBLE PARKING SPACES PROVIDED:	3 SPACES TOTAL
VAN ACCESSIBLE PARKING SPACES PROVIDED:	1 SPACE

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 04-125584 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 09/01/2026

DIVISION OF THE STATE ARCHITECT
109 VIA FRONTERA, SUITE 300
SAN DIEGO, CA 92127
ph: 858.674.5400 fx: 858.674.5471

DSA Application Number: 04-125584
DSA File Number: 33-15

agency

tBP architecture planning interiors

LICENSED ARCHITECT GREG L. GHEDI NO. C34187 EXP. 4-30-27 STATE OF CALIFORNIA

tBP/Architecture
3990 Concours Street, Suite 201
Ontario, CA 91764
ph: 909.635.6366 fx: 949.732.3895

architect

consultant

WILLIAM COLLIER ELEM SCHOOL SHADE STRUCTURE ADDITION & PLAYGROUND IMPROVEMENTS

LAKE ELSINORE UNIFIED SCHOOL DISTRICT
20150 MAYHALL DR.
WILDOMAR, CA. 92595

owner

tBP project number: 24006.00
file name:
drawn by: Z.B. checked by: K.W.
date: 8/20/2026 4:23:15 PM

rev:	date:	description:
	07/02/26	DSA SUBMITTAL

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drawing title:

OVERALL SITE PLAN

drawing no.:

AS-1

S:\24006.00 LEGED William Collier ES Shade Structure Addition\Drawings\00 CURRENT Revit\User Models\William Collier ES Site Improv_Central_EE.rvt

DSA

103-25

LIST OF STRUCTURAL TESTS AND SPECIAL INSPECTIONS

☐ Project has a geotechnical report or construction documents require special inspection by a geotechnical engineer.
☑ Project does NOT have and does NOT require a geotechnical report.

	TYPE	BY
S1 | SOILS - GENERAL		
☑ S1a: Site Preparation	See Notes	PI
S2 | COMPACTION AND FILL		
☐ S2a: Fill Materials	Test	LOR*
☐ S2b: Fill Placement	Continuous	LOR*
☐ S2c: Compaction	Test	LOR*
S3 | DRIVEN DEEP FOUNDATIONS (PILES)		
☐ S3a: Materials and Members	Continuous	GE*
☐ S3b: Pile Capacity	Test	LOR*
☐ S3c: Driving Operations	Continuous	GE*
☐ S3d: Pile Installation	Continuous	GE*
☐ S3e: Specialty Piles	*	*
S4 | CAST-IN-PLACE DEEP FOUNDATIONS (PIERS)		
☑ S4a: Drilling Operations	Continuous	PI
☑ S4b: Pier Construction	Continuous	PI
☑ S4c: Bearing Strata	Continuous	PI
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	Periodic	SI
C2 | PRESTRESSED CONCRETE		
☐ C2a: Tendons and Anchorage	Test	LOR
☐ C2b: Tendon Placement	Periodic	SI
☐ C2c: Concrete Strength	Periodic	SI
☐ C2d: Stressing Operations	Continuous	SI
C3 | PRECAST CONCRETE		
☐ C3a: General Fabrication	Continuous	SI
☐ C3b: General Erection	Periodic	SI*
☐ C3c: Diaphragm Connections	Continuous	SI
☐ C3d: Diaphragm Tolerances	Periodic	SI
C4 | SHOTCRETE		
☐ C4a: Placement	Continuous	SI
☐ C4b: Shotcrete Material	Test	LOR
C5 | POST-INSTALLED ANCHORS		
☐ C5a: Inspection	See notes	SI*
☐ C5b: Test	Test	LOR
C6 | OTHER CONCRETE		
☐ C6a: Not used.	N/A	N/A
☐ C6b: Not used.	N/A	N/A
☐ C6c: Not used.	N/A	N/A
☐ C6d: Not used.	N/A	N/A
☐ C6e: Not used.	N/A	N/A
☐ C6f: Not used.	N/A	N/A
☐ C6g: Not used.	N/A	N/A
☐ C6h: Not used.	N/A	N/A
☐ 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: **William Collier Elementary School** Application No.: **04-125584** Increment:
School District: **Lake Elsinore Unified** File No.: **33-15**

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	Continuous	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.		
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 | METAL BUILDING		
☐ S/A8a: Inspection	Periodic	SI
S/A9 | SPRAYED FIRE-RESISTANT MATERIALS		
☐ S/A9a: Surface and Installation	Periodic	SI
☐ S/A9b: Density	Test	LOR
☐ S/A9c: Bond: Adhesion/Cohesion	Test	LOR

* See Appendix for additional information.

Project Name: **William Collier Elementary School** Application No.: **04-125584** Increment:
School District: **Lake Elsinore Unified** File No.: **33-15**

LIST OF STRUCTURAL TESTS AND SPECIAL INSPECTIONS

	TYPE	BY
S/A10 | ANCHOR BOLTS AND ANCHOR RODS		
☐ S/A10a: Anchor Rods and Bolts	Test	LOR
☐ S/A10b: Other Threaded Rods	Test	LOR
S/A11 | STORAGE RACK SYSTEMS		
☐ S/A11a: Material Verification	Periodic	SI
☐ S/A11b: Fabrication	Periodic	SI
☐ S/A11c: Anchorage	Periodic	SI
☐ S/A11d: Completed System	Periodic	SI*
S/A12 | OTHER STEEL AND ALUMINUM		
☐ S/A12a: Not used.	N/A	N/A
☐ S/A12b: Not used.	N/A	N/A
☐ S/A12c: Not used.	N/A	N/A
☐ S/A12d: Not used.	N/A	N/A
☐ S/A12e: Not used.	N/A	N/A
☐ S/A12f: Not used.	N/A	N/A
☐ S/A12g: Not used.	N/A	N/A
☐ S/A12h: Not used.	N/A	N/A
☐ S/A12i: Not used.	N/A	N/A
☐ S/A12j: 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: **William Collier Elementary School** Application No.: **04-125584** Increment:
School District: **Lake Elsinore Unified** File No.: **33-15**

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. Structural Testing and Inspection: Form DSA 291
2. Concrete Batch Plant Inspection: Form DSA 291
3. Shop Welding Inspection: Form DSA 291 or DSA 292
4. Field Welding Inspection: Form DSA 291 or Form DSA 292
5. High-Strength Bolting 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:

Name of Structural Engineer of Record (when applicable):

ZIA DURRANI, SE (S-7114)

Signature of Architect or Structural Engineer: **Date:**

8/20/26

DSA STAMP

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 04-125584 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 09/01/2026

Project Name: **William Collier Elementary School**
School District: **Lake Elsinore Unified**

Application No.: **04-125584** Increment:
File No.: **33-15**

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.	Refer to specific items identified in the Appendix listing exemptions for limitations. Placement of controlled fill exceeding 12" depth under foundations is not permitted without a geotechnical report.

S2. SOIL COMPACTION AND FILL:	
Test or Special Inspection	**Code References and Notes**
S2a: Fill Materials | Perform classification and testing of fill materials.	* Under the supervision of the geotechnical engineer.
S2b: Fill Placement | Verify use of proper materials, densities and inspect lift thicknesses, placement and compaction during placement of fill.	* Under the supervision of a geotechnical engineer or LOR's engineering manager. Refer to specific items identified in the end of this form listing exemptions for limitations.
S2c: Compaction | Compaction testing.	Refer to specific items identified in the Appendix listing exemptions for limitations. Placement of controlled fill exceeding 12" depth under foundations is not permitted without a geotechnical report.

S3. DRIVEN DEEP FOUNDATIONS (PILES):	
Test or Special Inspection	**Code References and Notes**
S3a: Materials and Members | Verify pile materials, sizes and lengths comply with the requirements.	* By geotechnical engineer or his or her qualified representative.
S3b: Pile Capacity | Determine capacities of test piles and conduct additional load tests as required.	* Under the supervision of the geotechnical engineer.
S3c: Driving Operations | Inspect driving operations and maintain complete and accurate records for each pile.	* By geotechnical engineer or his or her qualified representative.

S3d: Pile Installation | Verify locations of piles and their plumbness, confirm type and size of hammer, record number of blows per foot of penetration, determine required penetrations to achieve design capacity, record tip and butt elevations and record any pile damage.	* By geotechnical engineer or his or her qualified representative.
S3e: Specialty Piles | For specialty piles, perform additional inspections as determined by the registered design professional in responsible charge.	* As defined on drawings or specifications.

S4. CAST-IN-PLACE DEEP FOUNDATIONS (PIERS):	
Test or Special Inspection	**Code References and Note**
S4a: Drilling Operations | Inspect drilling operations and maintain complete and accurate records for each pier.	Continuous inspection to be provided by project inspector. Refer to specific items identified in the Appendix (end of this form) listing exemptions for limitations.
S4b: Pier Construction | Verify pier locations, diameters, plumbness, bell diameters (if applicable), lengths and embedment into bedrock (if applicable); record concrete or grout volumes.	Continuous inspection to be provided by project inspector. Refer to specific items identified in the Appendix (end of this form) listing exemptions for limitations.
S4c: Bearing Strata | Confirm adequate end strata bearing capacity.	Provide tests and inspections per CONCRETE section below.

S5. RETAINING WALLS:	
Test or Special Inspection	**Code References and Notes**
S5a: Backfill Placement | Placement, compaction and inspection of backfill.	1705A.6.1. * By geotechnical engineer or his or her qualified representative. (See section S2 above).
S5b: Soil Reinf. and Drainage | Placement of soil reinforcement and/or drainage devices.	* By geotechnical engineer or his or her qualified representative.
S5c: Segmental Retaining Walls | Segmental retaining walls; inspect placement of units, dowels, connectors, etc.	* By geotechnical engineer or his or her qualified representative. See DSA IR 18-2.

S6 | OTHER SOILS	
Test or Special Inspection	**Code References and Notes**
S6a | Soil Improvements	Submit a comprehensive report documenting final soil improvements constructed, construction observation and the results of the confirmation testing and analysis to CGS (California Geological Survey) for final acceptance. * 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.4, 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.1.16; ASTM C31, ASTM C172; ACI 318 Sections 26.4, 26.5 & 26.12.**
C1d: Strength Test | Test concrete (f'c).	**1905A.1.16; 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.1 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 7 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.	**1413.2.1 (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.** 2201A.2**;** 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	**2201A.2.**
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.2.5**).
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, 2201A.2;** 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, 2216A.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.2.8, 2201 A.4**; 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.2.8, 2201A.4;** 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.2.7, 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 & 370 (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.2.3, Table 1705A.2.1 Items 5a.5 & 5a.6;** AISC 360 & 370 (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 & 370 (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.5;** 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 & 370 (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 & 370 (AISC 341 as applicable); DSA IR 17-3.
S/A5c: End Welded Studs | Inspect end-welded studs (ASTM A-108) installation (including bend test).	**2216A.2**; AISC 360 & 370 (AISC 341 as applicable); AWS D1.1; DSA IR 17-3.
S/A5d: Deck Welds | Inspect floor and roof deck welds.	**1705A.2.3, Table 1705A.2.1 Item 5a.6;** AISC 360 & 370 (AISC 341 as applicable); AWS D1.3; DSA IR 17-3.
S/A5e: Cold-Formed Steel | Inspect welding of structural cold-formed steel.	**1705A.2.7;** 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 370 (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.5;** 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.2.7;** 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.2.7;** 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.2.4, Table 1705A.2.4;** AWS D1.1; DSA IR 22-3 for steel joists only. **1705A.2.5;** AWS D1.3 for cold-formed steel trusses.

S/A8. METAL BUILDING:	
Test or Special Inspection	**Code References and Notes**
S/A8a: Inspection | Inspect: • Installation of rafter/beam flange braces and column flange braces. • Installation of purlins and girts, including specified lapping. • Purlin and girt restraint/bridging/bracing. • Installation of X-bracing, tightened to remove any sag	**1705A.2.6, Table 1705A.2.6, 1705A.2.1, 1705A.2.3, 1705A.2.4 and 1705A.2.5**

S/A9. SPRAYED FIRE-RESISTANT MATERIALS:	
Test or Special Inspection	**Code References and Notes**
S/A9a: 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/A9b: Density | Test density.	**1705A.15.1, 1705A.15.5, ASTM E605**
S/A9c: Bond: Adhesion/Cohesion | Bond strength adhesion/cohesion.	**1705A.15.1, 1705A.15.6, ASTM E736**

S/A10. ANCHOR BOLTS AND ANCHOR RODS:	
Test or Special Inspection	**Code References and Notes**
S/A10a: 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/A10b: 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/A11. STORAGE RACK SYSTEMS:	
Test or Special Inspection	**Code References and Notes**
S/A11a: 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/A11b: Fabrication | Fabricated storage rack elements.	1704A.2.5; Table 1705A.13.7
S/A11c: Anchorage | Storage rack anchorage installation.	ANSI/MH16.1 Section 7.3.2; Table 1705A.13.7
S/A11d: Completed System | Completed storage rack system to indicate compliance with the approved construction documents.	Table 1705A.13.7; * May be performed by the project inspector when specifically approved by DSA.

S/A12. Other Steel	
Test or Special Inspection	**Code References and Notes**
S/A12a. | Not used.	N/A
S/A12b. | Not used.	N/A
S/A12c. | Not used.	N/A
S/A12d. | Not used.	N/A
S/A12e. | Not used.	N/A
S/A12f. | Not used.	N/A
S/A12g. | Not used.	N/A
S/A12h. | Not used.	N/A
S/A12i. | Not used.	N/A
S/A12j. | Not used.	N/A
S/A12k. | Not used.	Not used.
S/A12l. | 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:

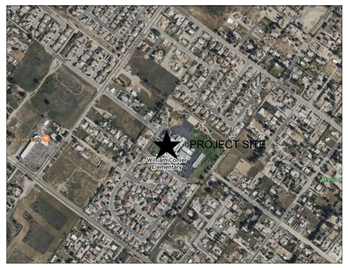
A. Underground vaults no greater than 16 feet in both length and width, of unlimited height, not subject to loading greater than HS 20-44. B. Pipe. C. Stair treads, landing planks.

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.

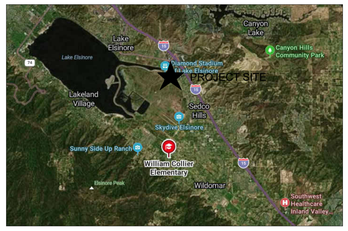
WILLIAM COLLIER ELEM SCHOOL SHADE STRUCTURE ADDITION & PLAYGROUND IMPROVEMENTS

LAKE ELSINORE UNIFIED SCHOOL DISTRICT





VICINITY MAP



AREA MAP

NORTH

tBP / Architecture

3990 Concours Street, Suite 201 - Ontario - California - 91764
http://www.tbparchitecture.com
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Architecture
Planning
Interiors

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 04-125584 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 09/01/2026

DIVISION OF THE STATE ARCHITECT
109 VIA FRONTERA, SUITE 300
SAN DIEGO, CA 92127
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DSA Application Number: 04-125584
DSA File Number: 33-15

agency

tBP architecture planning interiors

LICENSED ARCHITECT
GREG L. GREIG
NO. C34187
REN. 4-30-27
STATE OF CALIFORNIA

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architect

consultant

WILLIAM COLLIER ELEM SCHOOL SHADE STRUCTURE ADDITION & PLAYGROUND IMPROVEMENTS

LAKE ELSINORE UNIFIED SCHOOL DISTRICT
20150 MAYHALL DR.
WILDOMAR, CA. 92595

owner

tBP project number:	24006.00
file name:	
drawn by: Z.B.	checked by: K.W.
date:	8/20/2026 4:23:04 PM

rev:	date:	description:
	07/02/26	DSA SUBMITTAL

THIS DRAWING AND THE DESIGNS, DEPICTIONS, IDEAS AND OTHER INFORMATION CONTAINED HEREIN CONSTITUTE UNPUBLISHED WORK OF tBP/ARCHITECTURE AND SHALL REMAIN PROPERTY OF tBP/ARCHITECTURE IN PERPETUITY. NO PART THEREOF SHALL BE REPRODUCED, DISCLOSED, DISTRIBUTED, SOLD, PUBLISHED OR OTHERWISE USED IN ANY WAY WITHOUT THE ADVANCED EXPRESS WRITTEN CONSENT OF tBP/ARCHITECTURE.

drawing title:

COVER SHEET

drawing no.:

T-1

S:\24006.00 LESD William Collier ES Shade Structure Addition\Drawings\00 CURRENT Revit\User Models\William Collier ES Site Imprv_Central_EE.rvt

ABBREVIATIONS

&	AND
@	AT
℄	CENTERLINE
#	NUMBER
AC	ASPHALTIC CONCRETE
AFF	ABOVE FINISH FLOOR
BLDG.	BUILDING
CBC	CALIFORNIA BUILDING CODE
CFC	CALIFORNIA FIRE CODE
CJ	CONTROL JOINT
CLRM	CLASSROOM
DEMO	DEMOLITION
DF	DRINKING FOUNTAIN
DIA.	DIAMETER
DIM.	DIMENSION
DN	DOWN
DWG.	DRAWING
EA.	EACH
E.J.	EXPANSION JOINT
EQ.	EQUAL
(E)	EXISTING
FDC	FIRE DEPARTMENT CONNECTION
F.E.	FIRE EXTINGUISHER
F.E.C.F.	FIRE EXTINGUISHER CABINET
G.	FINISH GRADE
F.F.	FINISH FLOOR
GA	GAGE
GALV.	GALVANIZED
G.P.M.	GALLONS PER MINUTE
MAX.	MAXIMUM
M	METER
MIN.	MINIMUM
N.I.C.	NOT IN CONTRACT
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
O.F.C.I.	OWNER FURNISHED CONTRACTOR INSTALLED
O.F.O.I.	OWNER FURNISHED OWNER INSTALLED
P.S.I.	POUNDS PER SQUARE INCH
SIM.	SIMILAR
TYP.	TYPICAL
W/	WITH

SHEET INDEX

GENERAL

T-1	COVER SHEET
T-2	SHEET INDEX, GENERAL NOTES
T-3	(E) FIRE ACCESS SITE PLAN

(3 SHEETS)

CIVIL

C1.00	SITE DEMOLITION
C2.00	GRADING PLAN
C3.00	DETAIL SHEET

(3 SHEETS)

ARCHITECTURAL

AS-1	OVERALL SITE PLAN
AS-2	ENLARGED SITE PLANS
A7.1	ENLARGED RESTROOM PLANS
2.01	SITE AND MISC. EXTERIOR DETAILS
2.02	PLAYGROUND DETAILS
6.01	WALL TYPES AND MISC. INTERIOR DETAILS
8.01	SCHEDULES AND MISC. DETAILS

(7 SHEETS)

STRUCTURAL

S1.1	GENERAL NOTES
S1.2	TYPICAL DETAILS
S2.1	FOUNDATION DEMOLITION PLAN
S2.2	FRAMING DEMOLITION PLAN
S3.1	FOUNDATION PLAN
S3.2	FRAMING PLAN

(6 SHEETS)

MECHANICAL

M0-1	MECH LEGEND, SCHEDULES, AND GENERAL NOTES
M2-1	MECH DEMOLITION AND NEW FLOOR PLAN
M3-1	MECHANICAL DETAILS

(3 SHEETS)

ELECTRICAL

E0-1	ELECTRICAL GENERAL NOTES & SYMBOLS
E0-2	INDOOR - TITLE 24
E0-3	OUTDOOR - TITLE 24
E1-1	POWER SITE PLAN
E1-2	SIGNAL SITE PLAN
E2-1	FIRE ALARM, LIGHTING, AND POWER FLOOR PLANS
E3-1	FIRE ALARM CSFM LISTING, NOTES & DETAILS

(7 SHEETS)

PLUMBING

P0-1	PLUMBING LEGEND, SCHEDULES, AND GENERAL NOTES
P1-1	PLUMBING SITE DEMO PLAN
P1-2	PLUMBING SITE PLAN
P2-1	PLUMBING DEMOLITION AND NEW FLOOR PLAN

(4 SHEETS)

SHADE STRUCTURE DRAWINGS (PC-APPROVED)

METAL SHADE STRUCTURE A# 04-122015

S-1	TITLE SHEET
S-2	GENERAL DATA
S-3	GENERAL NOTES
S-4	EXAMPLE DSA-103 FORMS
S-5	SECTION PROPERTIES & REBAR DETAILS
S-6	FRAMING PLAN
S-7	FRAMING ELEVATIONS
S-8	FOUNDATION DETAILS
S-9	FRAMING CONNECTION DETAILS
S-10	PURLIN & ROOF DECK DETAILS

(10 SHEETS)

FABRIC SHADE STRUCTURE A# 04-123501

T-1.0	TITLE SHEET
T-2.0	UNIT SELECTION
T-3.0	T&I FORMS
19.1-1000	PRODUCT INFORMATION
19.2-2000	REACTIONS

(5 SHEETS)

TOTAL SHEET COUNT: 48

STATEMENT OF GENERAL CONFORMANCE

(Application No.: 04-125584
File No.: 33-15

The drawings identified as follows:

☒ All drawing sheets included in this set not bearing my stamp and signature.

☐ Drawing sheets denoted in the sheet index as follows:

☐ Drawing sheets included under the following PC approval (s)

have been prepared by other design professionals or consultants who are licensed and authorized to prepare such drawings (plans) in this state. They have 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 drawings (plans) and specifications are acceptable for incorporation into the construction of this project.

Per Title 24, Part 1, Section 4-316 (b): This 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

Signature — 07/02/2026 Date

HUNG CHENG	C34187	04/30/2027
Print Name	License Number	Expiration Date

PROJECT DESCRIPTION

PROJECT SCOPE INCLUDES: REMOVAL OF EXISTING LUNCH WOOD TRELLIS AND REPLACEMENT WITH NEW PC APPROVED METAL SHADE STRUCTURE. ADDITION OF (1) NEW PLAYGROUND AREA WITH NEW PLAY EQUIPMENT AND PC APPROVED FABRIC SHADE STRUCTURE. ADDITION OF (1) WALKING TRACK WITH NEW PC APPROVED FABRIC SHADE STRUCTURE. REMODEL OF (1) MEN'S AND (1) WOMEN'S RESTROOM IN BUILDING A.

PROJECT DIRECTORY

OWNER
LAKE ELSINORE UNIFIED SCHOOL DISTRICT
545 CHANEY STREET
LAKE ELSINORE, CA 92530
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ARCHITECT
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30 CORPORATE PARK, SUITE 401
IRVINE, CA 92606
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STRUCTURAL
SIEGFRIED ENGINEERING INC.
3428 BROOKSIDE ROAD
STOCKTON, CA 95219
PHONE: 951.289.7104

MECHANICAL
POCOCK DESIGN SOLUTIONS, INC.
14451 CHAMBERS ROAD, SUITE 210
TUSTIN, CA 92780
PHONE: 949.471.3903

ELECTRICAL
YOWANTO ENGINEERING, INC.
2705 N. TOWNE AVENUE, SUITE C
POMONA, CA 91767
PHONE: 909.626.6291

PLUMBING
POCOCK DESIGN SOLUTIONS, INC.
14451 CHAMBERS ROAD, SUITE 210
TUSTIN, CA 92780
PHONE: 949.471.3903

METAL SHADE
M BAR C CONSTRUCTION, INC.
1770 LA COSTA MEADOWS DRIVE
SAN MARCOS, CA 92078
PHONE: 760.744.4131

FABRIC SHADE
USA SHADES
1085 N. MAIN, STE. C
ORANGE, CA 92867
PHONE: 833.985.1775

PLAYGROUND APPARATUS
DAVE BANG
1885 NORTH MAIN STREET
ORANGE, CA 92685
PHONE: 800.669.2586

REFERENCE SYMBOLS

DETAIL REFERENCE
3 / 7.11
NUMBER ABOVE - DETAIL NUMBER
NUMBER BELOW - SHEET NUMBER

WHEELCHAIR IDENTIFICATION
30" x 48" CLR. FLOOR SPACE
34" MAX. A.F.F. COUNTERTOP
30"W X 27"H X 19"D CLR. KNEE SPACE
MIN.

MATERIAL SYMBOLS

CONCRETE

AC PAVING

ARTIFICIAL TURF

CERTIFICATIONS

APPLICATION NUMBER	CERTIFICATION STATUS	DATE
04-116323	#1 CERTIFICATION	02.19.2020
04-103757	#1 CERTIFICATION	01.02.2003
04-102299	#1 CERTIFICATION	05.31.2005
59096	#2 CERTIFICATION	02.19.2016
04-125440	PENDING (UNDER CONSTRUCTION)	TBD

APPLICABLE CODES

APPLICABLE CODES AS OF JANUARY 1, 2026

2025 CALIFORNIA ADMINISTRATIVE CODE (CAC), PART 1, TITLE 24 CCR.
2025 CALIFORNIA BUILDING CODE (C.B.C.), PART 2, TITLE 24 CCR.
2025 CALIFORNIA ELECTRICAL CODE (C.E.C.), PART 3, TITLE 24 CCR.
2025 CALIFORNIA MECHANICAL CODE (C.M.C.), PART 4, TITLE 24 CCR.
2025 CALIFORNIA PLUMBING CODE (C.P.C.), PART 5, TITLE 24 CCR.
2025 CALIFORNIA ENERGY CODE (C.E.C.), PART 6, TITLE 24 CCR.
2025 CALIFORNIA WILDLAND-URBAN INTERFACE CODE (CWUIC) TITLE 24, PART 7
2025 CALIFORNIA FIRE CODE (C.F.C.), PART 9, TITLE 24 CCR.
2025 CALIFORNIA EXISTING BUILDING CODE (CEBC), PART 10, TITLE 24 CCR.
2025 CALIFORNIA GREEN BUILDING STANDARDS CODE (CALGREEN), PART 11, TITLE 24 CCR.
2025 CALIFORNIA REFERENCED STANDARDS CODE, PART 12, TITLE 24 CCR.
2025 CALIFORNIA WILDLAND-URBAN INTERFACE CODE (CWUIC), PART 7, TITLE 24 CCR

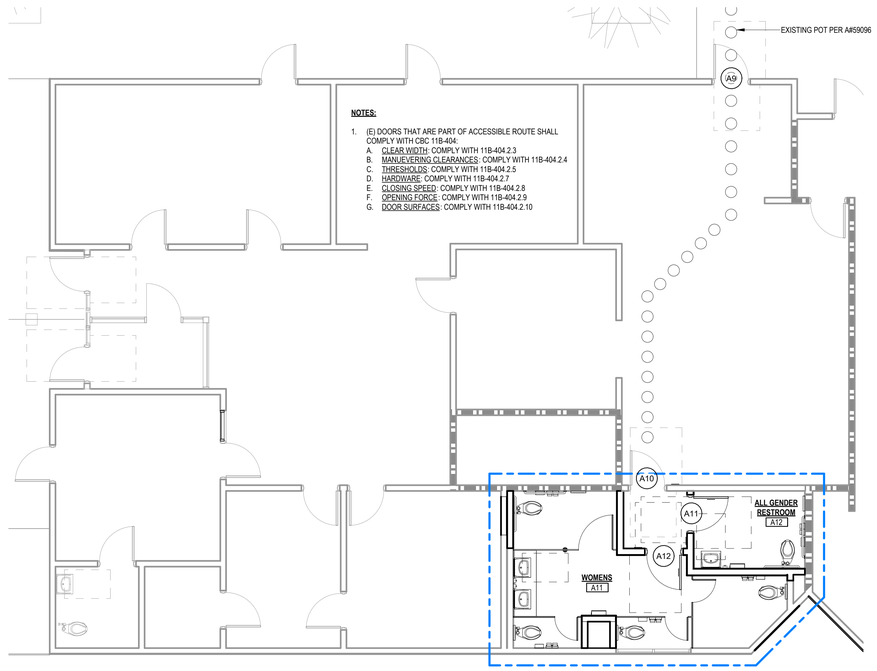
TITLE 19 C.C.R., PUBLIC SAFETY, STATE FIRE MARSHAL (SFM) REGULATIONS

APPLICABLE STANDARDS

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

GENERAL REQUIREMENTS

1. ALL WORK SHALL CONFORM TO 2025 EDITION TITLE 24, CALIFORNIA CODE OF REGULATIONS (CCR).
2. CHANGES TO THE APPROVED DRAWINGS AND SPECIFICATIONS SHALL BE MADE BY AN ADDENDA OR CONSTRUCTION CHANGE DOCUMENTS APPROVED BY THE DIVISION OF THE STATE ARCHITECT, AS REQUIRED BY SECTIONS 4-338, PART 1, TITLE 24, CCR.
3. A 'DSA CERTIFIED' PROJECT INSPECTOR EMPLOYED BY THE DISTRICT (OWNER) AND APPROVED BY THE DIVISION OF THE STATE ARCHITECT, SHALL PROVIDE CONTINUOUS INSPECTION OF THE WORK. THE DUTIES OF THE INSPECTOR ARE DEFINED IN SECTION 4-342, PART 1, TITLE 24, CCR.
4. A DSA INSPECTOR WITH A **CLASS (2)** CERTIFICATION IS REQUIRED FOR THIS PROJECT.
5. A DSA ACCEPTED TESTING LABORATORY DIRECTLY EMPLOYED BY THE DISTRICT SHALL CONDUCT ALL THE REQUIRED TESTS AND INSPECTIONS FOR THE PROJECT.
6. THE INTENT OF THESE DRAWINGS AND SPECIFICATIONS IS THAT THE WORK OF THE ALTERATIONS, REHABILITATION, OR RE-CONSTRUCTION IS TO BE DONE IN ACCORDANCE WITH TITLE 24, CCR. SHOULD ANY EXISTING CONDITION SUCH AS DETERIORATION OR NON-COMPLYING CONSTRUCTION BE DISCOVERED WHICH IS NOT COVERED BY THE CONTRACT DOCUMENTS WHEREIN THE FINISH WORK WILL NOT COMPLY WITH TITLE 24, CCR. A CONSTRUCTION CHANGE DOCUMENT (CCD) OR SEPARATE SET OF PLANS AND SPECIFICATIONS, DETAILING AND SPECIFYING THE REQUIRED WORK SHALL BE SUBMITTED TO AND APPROVED BY DSA BEFORE PROCEEDING WITH THE WORK (SECTION 4-317(C), PART 1, TITLE 24 CCR.).
7. SHOULD DSA FIND ANY WORK BEING PERFORMED IN A MANNER CONTRARY TO THE PROVISIONS OF THE CBC THAT WOULD COMPROMISE THE STRUCTURAL INTEGRITY OF THE BUILDING, THE DEPARTMENT OF GENERAL SERVICES, STATE OF CALIFORNIA, IS AUTHORIZED TO ISSUE A 'STOP WORK' ORDER PER SECTION 4-334.1 CALIFORNIA ADMINISTRATIVE CODE (PART 1, TITLE 24, CCR).
8. A COPY OF TITLE 24 PART 1 THROUGH 5 AND 9 SHALL BE KEPT ON CONSTRUCTION SITE.
9. WORK SHALL COMPLY WITH THE PROVISIONS OF CHAPTER 33 OF CBC & CFC, 2025 EDITION "FIRE SAFETY DURING CONSTRUCTION AND DEMOLITION.
10. A WRITTEN SITE SAFETY PLAN IN COMPLIANCE WITH CFC 3303.1.1 MUST BE PREPARED AND AVAILABLE ON SITE PRIOR TO COMMENCEMENT OF ANY MOBILIZATION, DEMOLITION AND /OR CONSTRUCTION.
11. NO DEMOLITION SHALL BEGIN UNTIL PLANS INCLUDING THE DEMOLITION WORK HAVE BEEN APPROVED BY DSA.
12. SUBSTITUTIONS AFFECTING ITEMS REGULATED BY THE DIVISION OF THE STATE ARCHITECT (DSA) REQUIRE DSA APPROVAL AS AN ADDENDUM OR A CONSTRUCTION CHANGE DOCUMENT (CCD). DSA APPROVAL SHALL BE OBTAINED PRIOR TO FABRICATION AND/ OR INSTALLATION PER SECTION 4-333, PART 1, TITLE 24, CCR.
13. FORMS FINAL DSA 152-IPI AND FINAL DSA 292 (WELDING) SHALL BE ON THE JOBSITE PRIOR TO INSTALLATION OF THE MODULAR UNITS, INCLUDING THE SERIAL NUMBER FOR EACH UNIT.
14. THE SITE PROJECT INSPECTOR SHALL VERIFY THE FORM FINAL DSA 152-IPI AND FINAL DSA 292 ARE APPLICABLE TO EACH UNIT PRIOR TO INSTALLATION OF THE UNITS.
15. NOTIFY THE ARCHITECT AND THE DIVISION OF THE STATE ARCHITECT FIELD ENGINEER IF ANY DISCREPANCIES OCCUR.



(E) BLDG A - INTERIOR POT TO AREA OF IMPROVEMENTS

SCALE: 3/16" = 1'-0"

1

ACCEPTANCE TESTING

THE CALIFORNIA ENERGY CODE SECTION 10-103 REQUIRES ACCEPTANCE TESTING ON ALL NEWLY INSTALLED LIGHTING CONTROLS, MECHANICAL SYSTEMS, ENVELOPES, AND PROCESS EQUIPMENT AFTER INSTALLATION AND BEFORE PROJECT COMPLETION. AN ACCEPTANCE TEST IS A FUNCTIONAL PERFORMANCE TEST TO HELP ENSURE THAT NEWLY INSTALLED EQUIPMENT IS OPERATING AND IN COMPLIANCE WITH THE ENERGY CODE.

LIGHTING CONTROLS ACCEPTANCE TESTS MUST BE PERFORMED BY A CERTIFIED LIGHTING CONTROLS ACCEPTANCE TEST TECHNICIAN (ATT).

MECHANICAL SYSTEMS ACCEPTANCE TESTS MUST BE PERFORMED BY A CERTIFIED MECHANICAL ATT FOR PROJECTS SUBMITTED ON OR AFTER OCTOBER 1, 2021.

ENVELOPE AND PROCESS EQUIPMENT ACCEPTANCE TESTS SHALL BE PERFORMED BY THE INSTALLING CONTRACTOR, ENGINEER / ARCHITECT OR RECORD OR THE OWNER'S AGENT.

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.

DESIGN INFORMATION

SEISMIC DESIGN INFORMATION - SHADE STRUCTURES (ASCE 7-16)

NOTE: PC IS DESIGNED PER CBC 2022
- ROOF LIVE LOAD: 20 PSF

SITE COORDINATES: 33.616219, -117.301217
- RISK CATEGORY: III
- SEISMIC IMPORTANCE FACTOR I(e): 1.25
- MAPPED SPECTRAL RESPONSE ACCESSERATION PARAMETERS
  S_S = 1.73 S_1 = 0.63
- SITE CLASS: DEFAULT
- DESIGN SPECTRAL RESPONSE ACCELERATION PARAMETER
  S_{DS} = 1.38 S_{D1} = N/A

GEOTECHNICAL INFORMATION
ALLOWABLE SOIL BEARING PRESSURE = 1,000 PSF

WIND DESIGN - SHADE STRUCTURES (ASCE 7-16)
- ULTIMATE DESIGN WIND SPEED: V = 102
- RISK CATEGORY: III
- WIND EXPOSURE CATEGORY: C
- INTERNAL PRESSURE COEFFICIENT: 0.00

FLOOD DESIGN DATA
- FLOOD ZONE: X
- FLOOD INSURANCE RATE MAP (FIRM) PANEL DESIGNATION: 06065C2681g
- EFFECTIVE DATE OF FIRM: 08.28.2008
- BASE FLOOR ELEVATION (BFE): N/A
- APPLICABLE COMMUNITY ORDINANCE SECTION: N/A

CLIMATE ZONE
- CALIFORNIA CLIMATE ZONE: 10

FIRE HAZARD SEVERITY ZONE

1. PROJECT IS NOT WITHIN A FIRE HAZARD SERVERITY ZONE.

WILDLAND INTERFACE AREA (WIFA)

1. PROJECT IS LOCATED WITHIN A WILDLAND INTERFACE AREA.

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 04-125584 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 09/01/2026

DIVISION OF THE STATE ARCHITECT

109 VIA FRONTERA, SUITE 300
SAN DIEGO, CA 92127
ph: 858.674.5400 fx: 858.674.5471

DSA Application Number: 04-125584
DSA File Number: 33-15

agency

tBP architecture planning interiors

LICENSED ARCHITECT HUNG L. CHENG NO. C34187 REN. 4-30-27 STATE OF CALIFORNIA

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architect

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rev:	date:	description:
	07/02/26	DSA SUBMITTAL

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drawing title:

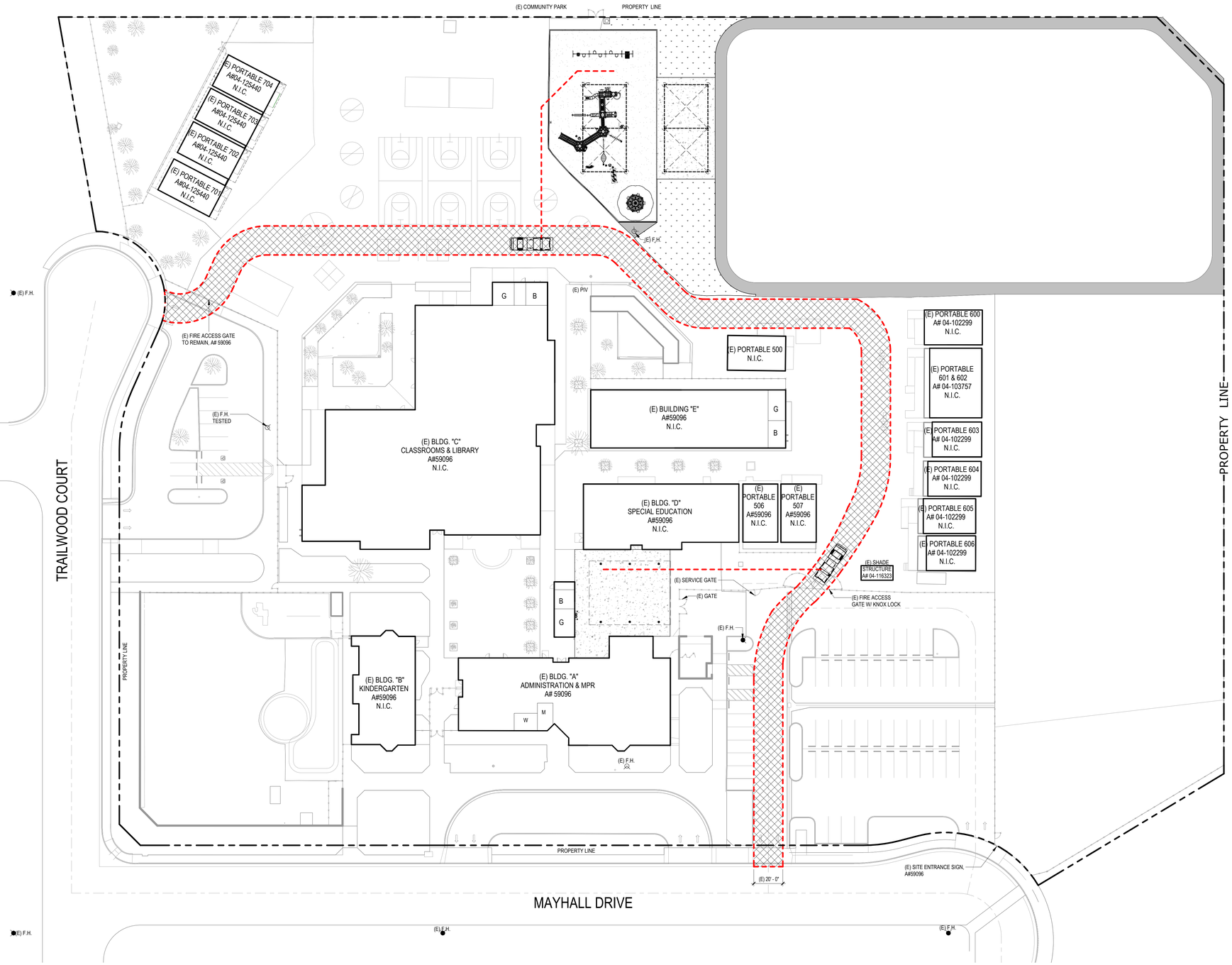
SHEET INDEX, GENERAL NOTES

drawing no.:

T-2

S:\24006.00 LEUSD William Collier ES Shade Structure Addition\Drawing\00 CURRENT Revit\User Models\William Collier ES Site Improv_Central_EE.rvt

NOTE:
1. CONTRACTOR OPERATIONS SHALL NOT BLOCK, HINDER, IMPEDE, OR OTHERWISE INHIBIT THE USE OF REQUIRED EXITS AT ANY TIME. CONTRACTOR SHALL MAINTAIN UNOBSTRUCTED ACCESS TO FIRE EXTINGUISHERS, FIRE HYDRANTS, TEMPORARY FIRE PROTECTION FACILITIES, STAIRWAYS, AND OTHER ACCESS ROUTES FOR FIRE-FIGHTING EQUIPMENT AND OR PERSONNEL.



(E) FIRE ACCESS SITE PLAN

SCALE: 1" = 30'-0"

1

LEGEND

- PROPERTY LINE
- EXISTING BUILDINGS
- (E) FIRE DEPARTMENT VEHICULAR ACCESS LANE (13'-6" MIN. UNOBSTRUCTED VERTICAL CLEARANCE) A#59096
- 150' MAX. REACH - FIRE HOSE PULL 5'-0" MIN. CLEAR WIDTH
- (E) FIRE HYDRANT

FIRE FLOW ANALYSIS

2025 CALIFORNIA FIRE CODE TABLE BB105.1 - MIN. REQUIRED FIRE FLOW AND DURATION FOR BUILDINGS

	FIRE AREA TYPE V-B	REQUIRED FIRE FLOW @ 20 PSI	FIRE FLOW @ 20 PSI (GPM)	FLOW DURATION (HOURS)
PC METAL & FABRIC SHADE CANOPIES	6,064 S.F.	2,000 G.P.M.	3,770 G.P.M.	2 HOURS

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 *PI. 09-01: Fire Flow for Buildings*.

PROJECT INFORMATION	
School District/Owner:	Lake Elsinore Unified School District
Project Name/School:	Shade Structure Addition & Playground Improvements / William Collier Elementary School
Project Address:	20150 Mayhall Drive, Wildomar, CA 92595

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 ☐

FIRE FLOW TEST

SoCal Flow Testing
3741 Rose Dr, Yorba Linda, CA 92886
714-261-5716
email: info@socalflowtest.com

Hydrant Flow Test Report

Project: **William Collier Elementary School** — Test date: **2/20/26**
Address: **20150 Mayhall Dr** — Test time: **14:30**
City: **Wildomar** State: **CA** — File no.:

Test hydrant location: **North parking lot of 20150 Mayhall Dr** Hydr # — Elev (ft +/-) **Grade**
Flow hydrant location: **Playground east of school buildings** Hydr # — Elev (ft +/-) **Grade**

Static Pressure **45** PSI — Report Date **2/20/26**

Outlet	C-value	Diam	Pitot		Volume	
A	0.9	2.0	0	PSI	0	GPM
B	0.9	2.5	33	PSI	964	GPM
C	0.9	3.0	0	PSI	0	GPM
D	0.83	4.0	0	PSI	0	GPM

Residual Pressure **43** PSI at an observed volume of **964** GPM

Projected Pressure **20** PSI calculates to a volume of **3770** GPM

Although the results are accurate for the date and time given, they may not accurately reflect higher or lower readings which vary due to seasonal conditions and time of day.

Per NFPA 24-10, Table C.4.10.1(a), note 1, $Q=29.84 \times c(d)^2 (p)^{0.5}$
Per NFPA 24-10, Paragraph C.4.10.1.2, $Q_r = Q_t \times (h_r)^{0.54}$
Test by: Hildebrandt

Witness Bob ? Lake Elsinore USD (714) 430-4684
Client Bradd Runge, Facilities Director Lake Elsinore USD (714) 335-6885

cc: bradd.runge@leusd.k12.ca.us
kwong@tbparchitecture.com
ron.canedy@rplandassociates.com

Symbols: T = Test hydrant, F = Flow hydrant



IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 04-125584 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 09/01/2026

DIVISION OF THE STATE ARCHITECT
109 VIA FRONTERA, SUITE 300
SAN DIEGO, CA 92127
ph: 858.674.5400 fx: 858.674.5471

DSA Application Number: 04-125584
DSA File Number: 33-15

agency

tBP architecture planning interiors
tBP/Architecture
3990 Concours Street, Suite 201
Ontario, CA 91764
ph: 909.635.6366 fx: 949.732.3895

LICENSED ARCHITECT — GREG L. GHEDI — NO. C34187 — REN. 4-30-27 — STATE OF CALIFORNIA

architect

consultant

WILLIAM COLLIER ELEM SCHOOL SHADE STRUCTURE ADDITION & PLAYGROUND IMPROVEMENTS

LAKE ELSINORE UNIFIED SCHOOL DISTRICT
20150 MAYHALL DR.
WILDOMAR, CA. 92595

owner

tBP project number: 24006.00
file name:
drawn by: B.C. checked by: K.W.
date: 8/20/2026 4:23:10 PM

rev:	date:	description:
	07/02/26	DSA SUBMITTAL

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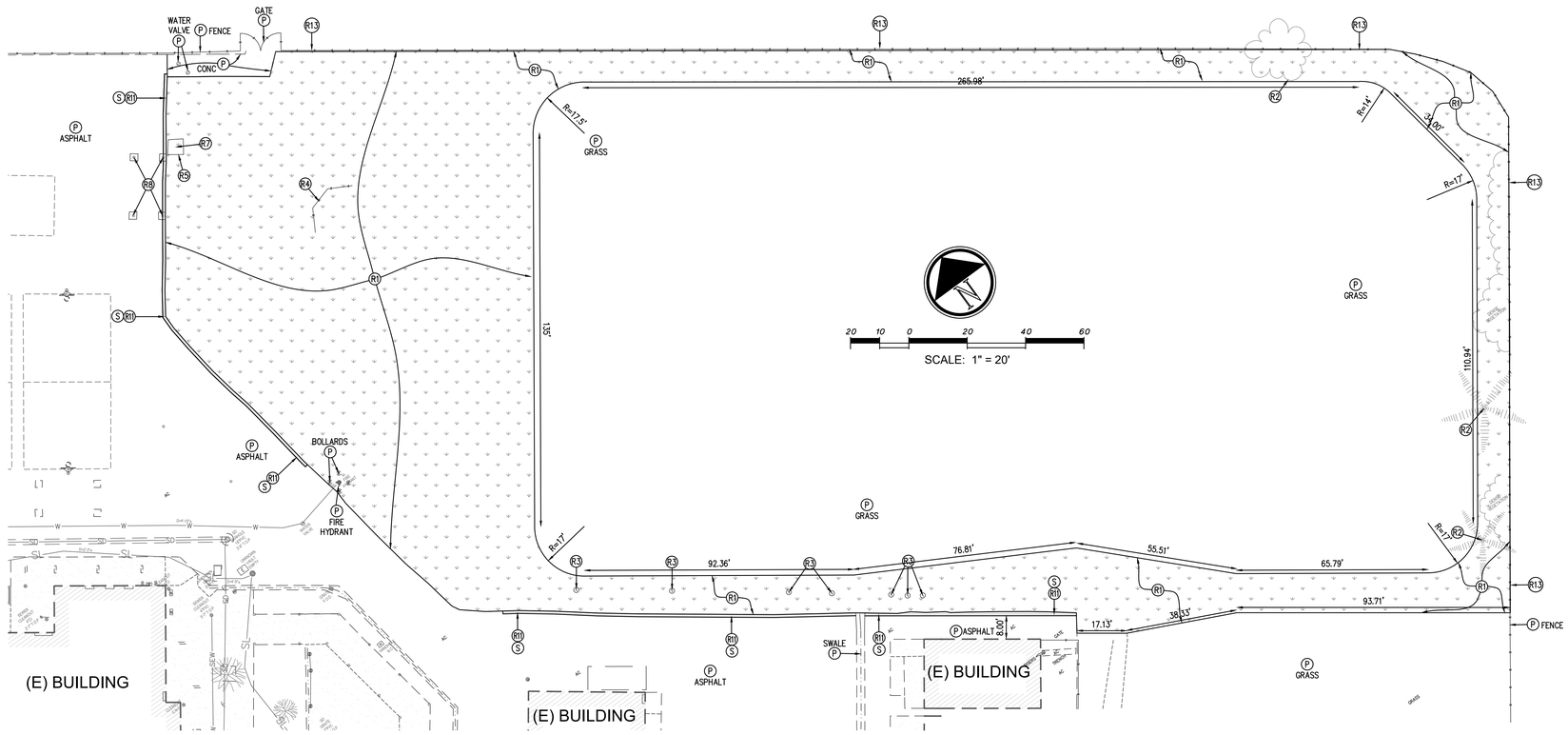
drawing title:

(E) FIRE ACCESS SITE PLAN

drawing no.:

T-3

S:\24006.00 LEUSD William Collier ES Shade Structure Addition\Drawing\00 CURRENT Rev\Eblast Model\William Collier ES Site Improv - Central - EE.rvt



HATCH LEGEND:

= EXISTING BUILDING

= EXISTING CONCRETE TO BE PROTECTED

= CLEAR AND GRUB TURF (R1)

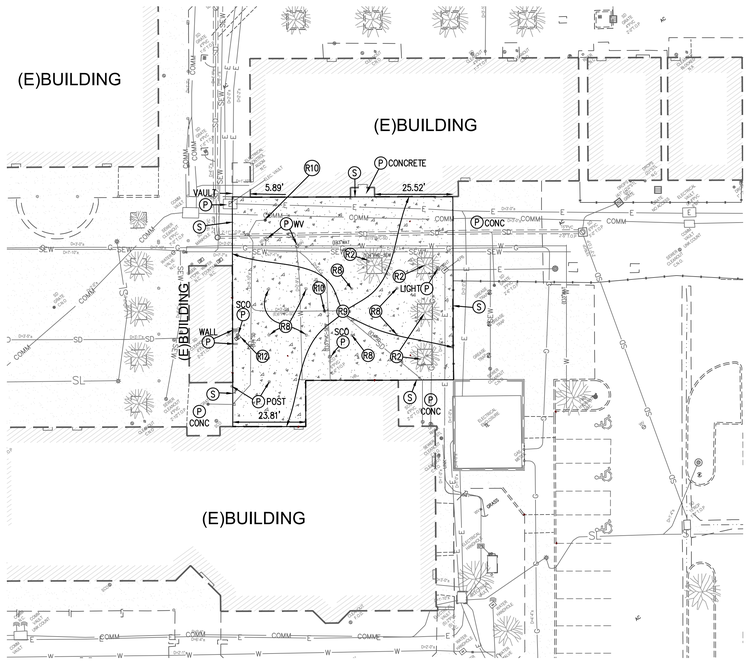
= REMOVE AND DISPOSE OF CONCRETE PAVEMENT (R9)

GENERAL SITE DEMOLITION NOTES

1. ALL ITEMS, SHOWN ON THIS PLAN TO BE REMOVED, SHALL BE VERIFIED BY THE OWNER PRIOR TO DEMOLITION. THE CONTRACTOR SHALL MEET WITH THE OWNERS REPRESENTATIVE PRIOR TO CLEARING AND GRUBBING.
2. THE CONTRACTOR SHALL VERIFY THE LOCATION AND QUANTITY OF EXISTING SURFACE STRUCTURES AND SHALL BE SOLELY RESPONSIBLE FOR ANY UNIDENTIFIED UTILITIES, IMPROVEMENTS, TREES, ETC,. TO BE DEMOLISHED AND REMOVED WITHIN THE DEMOLITION LIMIT LINE, INCLUDING APPURTENANT FOUNDATIONS OR SUPPORTS.
3. REMOVAL OF LANDSCAPING SHALL INCLUDE ROOTS TO 2 FEET BELOW GRADE AND ORGANIC MATERIAL.
4. ALL CONCRETE & CMU BLOCK WALLS & PLANTERS SHOWN ON THIS PLAN TO BE REMOVED SHALL INCLUDE WALL FOOTINGS & FOUNDATIONS IN THEIR REMOVAL.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR A SITE INSPECTION TO FIELD VERIFY AND FULLY ACKNOWLEDGE THE EXTENT OF THE DEMOLITION WORK. ALL ITEMS TO BE REMOVED SHALL BE MARKED BY THE CONTRACTOR PRIOR TO DEMOLITION.
6. DAMAGE TO ANY EXISTING UTILITIES AND SERVICES WHICH ARE TO REMAIN SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. CONTRACTOR SHALL REPAIR AND/OR REPLACE IN KIND.
7. TEMPORARY EROSION CONTROL MEASURES SHALL BE IMPLEMENTED TO PREVENT DEBRIS AND UNSUITABLE MATERIALS FROM ENTERING STORM DRAIN, SANITARY SEWERS AND STREETS.
8. DUST CONTROL SHALL BE IMPLEMENTED DURING DEMOLITION.
9. THE PROVISIONS OF CALIFORNIA FIRE CODE CHAPTER 33 AND CALIFORNIA BUILDING CODE CHAPTER 33 SHALL BE ENFORCED ON THIS PROJECT.
10. THE CONTRACTOR SHALL DEMOLISH AND REMOVE ALL LANDSCAPING WATERING SYSTEMS WITHIN THE DEMOLITION LIMIT LINE UNLESS DESIGNATED TO REMAIN IN PLACE ON THE PLANS. WHERE THE DEMOLITION IMPACTS EXISTING LANDSCAPE TO REMAIN, MODIFY THE EXISTING IRRIGATION SYSTEM, INCLUDING ADDING IRRIGATION HEADS AS NECESSARY TO MAINTAIN COMPLETE AND FULL COVERAGE OF EXISTING PLANNING.
11. THE CONTRACTOR SHALL BACKFILL SOIL IN THE EXCAVATED TREE ROOT PITS AND THE TRENCHES FOR REMOVED EXISTING UNDERGROUND STRUCTURES, UTILITIES, AND IMPROVEMENTS.
12. THE CONTRACTOR SHALL NOT ABANDON-IN-PLACE ANY EXISTING UNDERGROUND STRUCTURE, UTILITY, OR IMPROVEMENT SO DESIGNATED FOR REMOVAL ON THE PROJECT PLANS UNLESS DIRECTED TO BY THE OWNER.
13. CONTRACTOR TO SAWCUT ALL EXISTING A.C. AND CONCRETE PAVEMENT AT DEMOLITION LIMIT LINE. CONTRACTOR SHALL REMOVE SIDEWALK, CURB & GUTTER TO THE NEAREST JOINT.
14. CONTRACTOR SHALL REPLACE ALL EXISTING IMPROVEMENTS OUTSIDE THE DEMOLITION LIMIT LINE THAT ARE DAMAGED DURING CONSTRUCTION TO MATCH EXISTING, INCLUDING PERMANENT TRENCH RESURFACING.
15. CONTRACTOR SHALL FIELD VERIFY THAT THE REMOVAL OF EXISTING UTILITIES WILL NOT IMPACT AREA OPERATIONS.
16. CONTRACTOR IS RESPONSIBLE TO KEEP ALL UTILITES OPERATIONAL THAT SERVES FACILITIES OUTSIDE THE SCOPE OF THE DEMOLITION ZONE. CONTRACTOR IS ALSO RESPONSIBLE TO REROUTE UTILITIES IF NECESSARY TO COMPLETE DEMOLITION.
17. CONTRACTOR SHALL INSTALL A TEMPORARY MINIMUM 6' HIGH CHAIN LINK CONSTRUCTION FENCE, WITH GREEN SCREEN, AROUND PERIMETER OF WORK AREA.
18. ALL EXISTING DRAINAGE STRUCTURES ON SITE SHALL BE PROTECTED AND REMAIN FUNCTIONAL DURING DEMOLITION AND THROUGH THE CONSTRUCTION PERIOD. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO THESE STRUCTURES, OR DAMAGE CAUSED TO ADJACENT PROPERTIES DUE TO THE OBSTRUCTION OF THESE STRUCTURES.
19. BEFORE EXCAVATING ANY TRENCH 5 FEET OR MORE IN DEPTH, THE CONTRACTOR SHALL SUBMIT A DETAILED PLAN TO THE SCHOOL SHOWING THE DESIGN OF SHORING, BRACING, SLOPING, OR OTHER PROVISIONS TO BE MADE FOR THE WORKERS' PROTECTION FROM THE HAZARD OF CAVING GROUND DURING THE EXCAVATION OF SUCH TRENCH. IF THE PLAN VARIES FROM THE SHORING SYSTEM STANDARDS, THE PLAN SHALL BE PREPARED BY A REGISTERED CIVIL ENGINEER. NO EXCAVATION SHALL START UNTIL THE SCHOOL HAS ACCEPTED THE PLAN AND THE CONTRACTOR HAS OBTAINED A PERMIT FROM THE STATE DIVISION OF INDUSTRIAL SAFETY.

LEGEND

UTILITY/POWER POLE	SIGNAL PULLBOX	DC	DETECTOR CHECK
SEWER MANHOLE	CABLE TV PULLBOX	BFV	BACK FLOW VALVE
STORM DRAIN MANHOLE	COMMUNICATIONS PULLBOX	BW	BACK OF WALK
TELEPHONE MANHOLE	UNKNOWN PULLBOX	TW	TOP OF WALL
FIRE HYDRANT	FIRE DEPT CONNECTION	AC	ASPHALT PAVEMENT
FLOOD LIGHT	CHAIN LINK FENCE	TPB	TELEPHONE PULL BOX
HOSE BIB	WOOD FENCE	EPB	ELECTRIC PULL BOX
SEWER CLEANOUT	TREE		CONCRETE
WATER VALVE	PALM		IRRIGATION VALVE
GAS VALVE	PINE		GUARD POST
WATER METER	BUSH		FLOW LINE
GAS METER	TRASH ENCLOSURE		GRATE
WATER VAULT	ELECTRICAL TRANSFORMER		HANDICAP
GAS VAULT	FINISHED SURFACE		FLAG POLE
TELEPHONE VAULT	FINISHED FLOOR		FIRE SPRINKLER RISER
ELECTRIC VAULT	GRADE BREAK		SURVEY MONUMENT
SIGNAL VAULT	TOP OF CURB		SIGN POST
MONITORING WELL	FLOW LINE	INV	INVERT
STREET LIGHT	TOP OF GRATE	MB	MAIL BOX
TRAFFIC SIGNAL	TOP TOP ELEVATION		
PEDESTRIAN BUTTON	BOTTOM ELEVATION		
GUY WIRE	CAR STOP		
RAILROAD SIGNAL	BLOCK WALL		
WATER BLOWOFF VALVE			



SITE DEMOLITION NOTES:

- (P) PROTECT EXISTING IMPROVEMENT IN PLACE.
- (S) SAWCUT EXISTING PAVEMENT WITH CLEAN EDGE.
- (R1) CLEAR AND GRUB EXISTING TURF AND REMOVE IRRIGATION HEADS AND PIPING.
- (R2) REMOVE & DISPOSE OF EXISTING TREE AND ROOTS TO 24" BELOW GRADE.
- (R3) REMOVE & RELOCATE EXISTING IRRIGATION CONTROL VALVE OUTSIDE OF WORK AREA.
- (R4) REMOVE & DISPOSE OF EXISTING BACKSTOP.
- (R5) REMOVE & DISPOSE OF EXISTING FENCE, POST, AND FOOTINGS.
- (R6) OPEN NOTE.
- (R7) REMOVE & SALVAGE EXISTING IRRIGATION CONTROLLER. DISPOSE OF CONCRETE PAD.
- (R8) REMOVE & DISPOSE OF EXISTING SHADE STRUCTURE, POST AND FOOTING.
- (R9) REMOVE & DISPOSE OF EXISTING CONCRETE PAVEMENT AND BASE MATERIAL.
- (R10) REMOVE EXISTING GRATE AND PROTECT OUTGOING STORM DRAIN FOR NEW STORM DRAIN CONNECTION SHOWN ON GRADING PLAN.
- (R11) REMOVE & DISPOSE OF 12" WIDE STRIP OF EXISTING ASPHALT PAVEMENT.
- (R12) REMOVE & DISPOSE OF EXISTING DRINKING FOUNTAIN.
- (R13) PROTECT EXISTING CHAIN-LINK FENCE AND FENCE POSTS FOR THE INSTALLATION OF NEW REDWOOD HEADER PER 5/2.01.

UNDERGROUND UTILITY LINETYPE LEGEND:

UNK	(E)UNKNOWN UTILITY
SD	(E)STORM DRAIN
W	(E)DOMESTIC WATER
SEW	(E)SANITARY SEWER
G	(E)GAS
E	(E)ELECTRICAL/POWER
COMM	(E)COMMUNICATIONS
SL	(E)LIGHTING CONDUIT

1'-6" DEPTH FROM SURFACE — DEPTH OF (E)UTILITY ARE APPROXIMATE AND PROVIDED FROM THE UNDERGROUND UTILITY MAPPING SURVEY. ESTIMATED DEPTHS ARE FROM THE GROUND SURFACE TO THE CENTER OF THE PIPE, INVERT OF WASTE LINES, OR TO THE PIPE TRACER WIRE. DEPTH ESTIMATES SHOULD BE USED WITH CAUTION AND MAY VARY ALONG THE LENGTH OF THE UTILITY.

EXISTING UNDERGROUND STRUCTURES

THE LOCATIONS OF THE EXISTING UNDERGROUND UTILITIES, AS SHOWN ON THIS PLAN, WERE OBTAINED FROM SOURCES OF VARYING RELIABILITY. NO REPRESENTATION IS MADE AS TO THE ACCURACY OR COMPLETENESS OF SAID UTILITY INFORMATION. THE CONTRACTOR IS CAUTIONED THAT ONLY ACTUAL EXCAVATION WILL REVEAL THE LOCATIONS OF SUCH UNDERGROUND UTILITIES. CONTRACTOR SHALL VERIFY LOCATIONS OF EXISTING UTILITIES PRIOR TO ANY EXCAVATION OR IMPROVEMENT.

CONTRACTOR SHALL COMPLY WITH CBC AND CFC CH 33 - FIRE SAFETY DURING CONSTRUCTION AND DEMOLITION. REFER TO DSA BULLETIN 24-05 FOR FURTHER INFORMATION

NOTE TO CONTRACTOR: THE REMOVAL AND DISPOSAL OF EXISTING HARDSCAPE & SOFTSCAPE, TO FACILITATE THE TRENCHING OF NEW UNDERGROUND UTILITIES, VAULTS, VALVES, DRAIN INLETS, MANHOLES, ETC. SHOWN IN THE ENTIRE PLAN SET IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE WITH ALL SUB-CONTRACTORS.

EARTHWORK NOTICE TO CONTRACTOR: NO EARTHWORK ANALYSIS HAS BEEN COMPLETED WITH RESPECT TO VOLUMES OF SOILS TO BE EXCAVATED, PLACED, OR IMPORTED IN ORDER TO PROVIDE THE FINISHED GRADES SHOWN ON THE PLANS. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR VERIFYING THE EARTHWORK QUANTITIES NECESSARY TO COMPLETE THE PROJECT.

CONSTRUCTION STORM WATER NOTE:
GRADING WORK ASSOCIATED WITH THIS PROJECT WILL DISTURB LESS THAN 1 ACRE OF SOIL AND THUS SHALL NOT BE SUBJECT TO COMPLY WITH THE NPDES GENERAL PERMIT FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION AND LAND DISTURBANCE ACTIVITIES (GENERAL PERMIT) ORDER WQ 2022-0057-DWQ.

NOTE TO CONTRACTOR: BEFORE DEMOLITION OR TRENCHING OCCURS, THE CONTRACTOR SHALL COMPLETE AN UNDERGROUND UTILITY MAPPING SURVEY OF THE ENTIRE LIMITS OF WORK TO DETERMINE WHERE EXISTING UTILITIES ARE AND WHERE POSSIBLE UNDERGROUND CONFLICTS MAY OCCUR. PROVIDE SURVEY TO OWNER.

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 04-125584 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 09/01/2026

DIVISION OF THE STATE ARCHITECT
109 VIA FRONTERA, SUITE 300
SAN DIEGO, CA 92127
ph: 858.674.5400 fx: 858.674.5471

DSA Application Number: 04-125584
DSA File Number: 33-15

agency

tBP
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planning
interiors
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3990 Concours Street, Suite 201
Ontario, CA 91764
ph: 909.635.6386 fx: 949.732.3895

architect

FPL and Associates, Inc.
Engineering•Traffic•Civil•Transportation•Site Development
30 Corporate Park, Suite 401, Irvine, CA 92606
T: 949-252-1688•F: 949-252-0088
www.FPLandAssociates.com

REGISTERED PROFESSIONAL ENGINEER — ALAN W. COLLEE — No. 74871 — EXP. 09/30/27 — CIVIL — STATE OF CALIFORNIA

consultant

WILLIAM COLLIER ELEM SCHOOL SHADE STRUCTURE ADDITION & PLAYGROUND IMPROVEMENTS

LAKE ELSINORE UNIFIED SCHOOL DISTRICT
20150 MAYHALL DR.
WILDOMAR, CA. 92595

owner

tBP project number:	24006.00
file name:	
drawn by:	checked by:
date:	

rev:	date:	description:
	07/02/26	DSA SUBMITTAL

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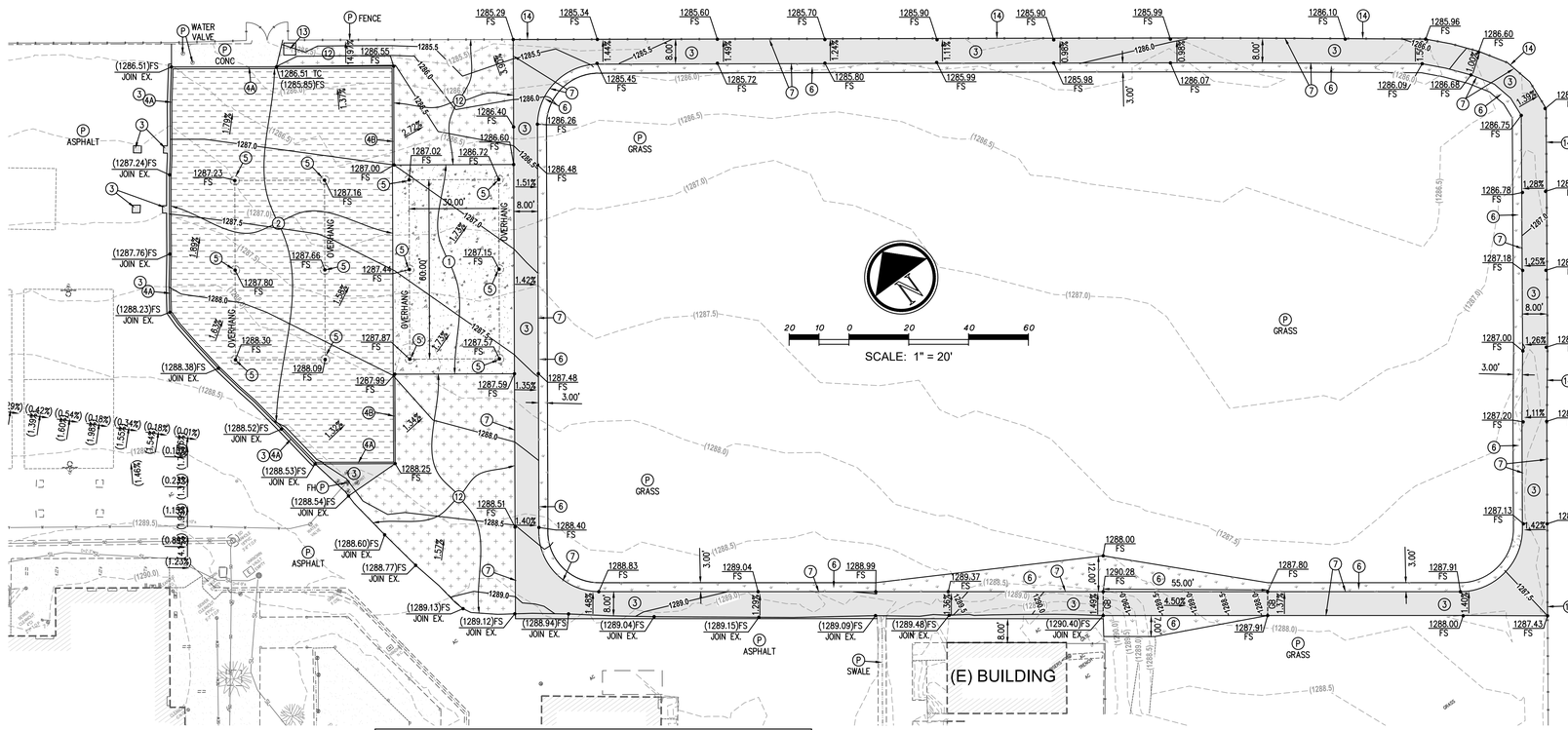
drawing title:

SITE DEMOLITION PLAN

drawing no.:

C1.00

Plot Date: 8/20/2026 5:21:35 PM Last Save By: madeline.chung Login: Madeline Chung S:\Jobs\2757 - TBP Architects\2757126 - William Collier ES\Civil\Shade Str\William Collier ES - C1.00 Demolition Plan.dwg



LEGEND

- UTILITY/POWER POLE
- SEWER MANHOLE
- STORM DRAIN MANHOLE
- TELEPHONE MANHOLE
- FIRE HYDRANT
- FLOOD LIGHT
- HOSE BIB
- SEWER CLEANOUT
- WATER VALVE
- GAS VALVE
- WATER METER
- GAS METER
- WATER VAULT
- GAS VAULT
- TELEPHONE VAULT
- ELECTRIC VAULT
- SIGNAL VAULT
- MONITORING WELL
- STREET LIGHT
- TRAFFIC SIGNAL
- PEDESTRIAN BUTTON
- GUY WIRE
- RAILROAD SIGNAL
- WATER BLOWOFF VALVE
- SIGNAL PULLBOX
- CABLE TV PULLBOX
- COMMUNICATIONS PULLBOX
- UNKNOWN PULLBOX
- FIRE DEPT CONNECTION
- CHAIN LINK FENCE
- WOOD FENCE
- TREE
- PALM
- PINE
- BUSH
- TE TRASH ENCLOSURE
- TR ELECTRICAL TRANSFORMER
- FS FINISHED SURFACE
- FF FINISHED FLOOR
- GB GRADE BREAK
- TC TOP OF CURB
- FL FLOW LINE
- TG TOP OF GRATE
- TOP TOP ELEVATION
- BTM BOTTOM ELEVATION
- CAR STOP
- BLOCK WALL
- DC DETECTOR CHECK
- BFV BACK FLOW VALVE
- BW BACK OF WALK
- TW TOP OF WALL
- AC ASPHALT PAVEMENT
- TPB TELEPHONE PULL BOX
- EPB ELECTRIC PULL BOX
- CONCRETE
- IRRIGATION VALVE
- GUARD POST
- FLOW LINE
- GRATE
- HANDICAP
- FLAG POLE
- FIRE SPRINKLER RISER
- SURVEY MONUMENT
- SIGN POST
- INV INVERT
- MAIL BOX

NOTE TO CONTRACTOR: WHERE NEW CONCRETE FLATWORK JOINS EXISTING CONCRETE FLATWORK, INSTALL AN EXPANSION JOINT PER DETAIL AA/C3.00. NEW CONCRETE MUST MEET BE FLUSH WITH EXISTING CONCRETE.

CONTRACTOR SHALL COMPLY WITH CBC AND CFC CH 33 - FIRE SAFETY DURING CONSTRUCTION AND DEMOLITION. REFER TO DSA BULLETIN 24-05 FOR FURTHER INFORMATION

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- G / G — (E)GAS
- E / E — (E)ELECTRICAL/POWER
- COMM / COMM — (E)COMMUNICATIONS
- SL / SL — (E)LIGHTING CONDUIT
- SD / SD — PROPOSED STORM DRAIN

1'-6" DEPTH FROM SURFACE — DEPTH OF (E)UTILITY ARE APPROXIMATE AND PROVIDED FROM THE UNDERGROUND UTILITY MAPPING SURVEY. ESTIMATED DEPTHS ARE FROM THE GROUND SURFACE TO THE CENTER OF THE PIPE, INVERT OF WASTE LINES, OR TO THE PIPE TRACER WIRE. DEPTH ESTIMATES SHOULD BE USED WITH CAUTION AND MAY VARY ALONG THE LENGTH OF THE UTILITY.

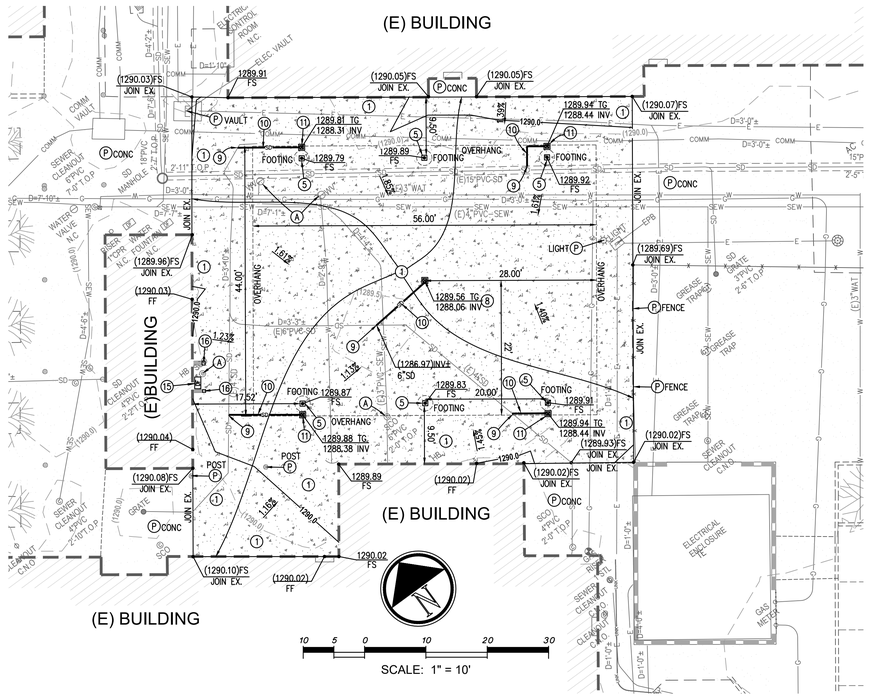
EXISTING UNDERGROUND STRUCTURES
THE LOCATIONS OF THE EXISTING UNDERGROUND UTILITIES, AS SHOWN ON THIS PLAN, WERE OBTAINED FROM SOURCES OF VARYING RELIABILITY. NO REPRESENTATION IS MADE AS TO THE ACCURACY OR COMPLETENESS OF SAID UTILITY INFORMATION. THE CONTRACTOR IS CAUTIONED THAT ONLY ACTUAL EXCAVATION WILL REVEAL THE LOCATIONS OF SUCH UNDERGROUND UTILITIES. CONTRACTOR SHALL VERIFY LOCATIONS OF EXISTING UTILITIES PRIOR TO ANY EXCAVATION OR IMPROVEMENT.

CONSTRUCTION NOTES:

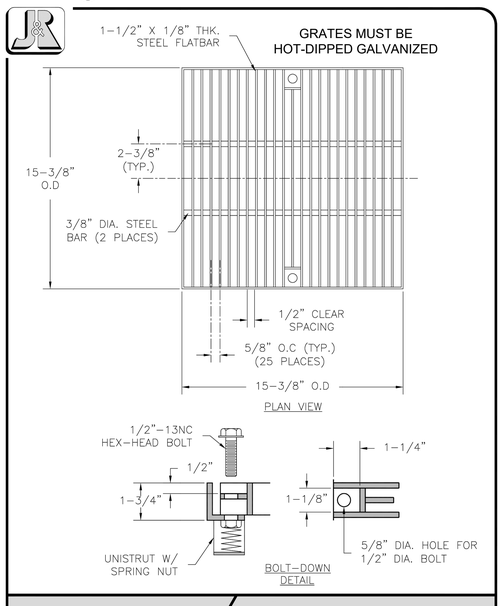
(P) PROTECT EXISTING IMPROVEMENT IN PLACE.
(A) ADJUST EXISTING VALVE BOX / CLEANOUT LID TO BE FLUSH WITH ULTIMATE FINISH SURFACE.
(1) CONSTRUCT CONCRETE PAVEMENT PER DETAIL 1/C3.00.
(2) CONSTRUCT POUR-IN-PLACE RUBBER PLAYGROUND SURFACING PER ARCHITECTURAL PLANS.
(3) CONSTRUCT ASPHALT PAVEMENT PER DETAIL 3/C3.00.
(4A) CONSTRUCT PLAYGROUND SURFACE EDGE TRANSITION PER DETAIL 16/2.01.
(4B) CONSTRUCT PLAYGROUND SURFACE EDGE TRANSITION PER DETAIL 17/2.01.
(5) CONSTRUCT SHADE STRUCTURE, POSTS AND FOOTINGS PER CANOPY DRAWINGS.
(6) HYDROSEED TURF TO MATCH EXISTING SPECIES AND MODIFY AND/OR ADD IRRIGATION PIPES AND HEADS AS NECESSARY.
(7) CONSTRUCT REDWOOD HEADER PER DETAIL 7/C3.00,
(8) CONSTRUCT 18" x 18" PRECAST CONCRETE CATCH BASIN WITH GALVANIZED ADA, PARKWAY RATED GRATE.
(9) CONNECT TO EXISTING STORM DRAIN WITH APPLICABLE FITTINGS & COUPLINGS.
(10) CONSTRUCT 4" SDR-35 PVC GASKETED PIPE PER APPLICABLE TRENCHING DETAILS ON C3.00.
(11) CONSTRUCT 12" x 12" PRECAST CONCRETE CATCH BASIN WITH GALVANIZED ADA, PARKWAY RATED GRATE PER DETAIL 11 HEREON. PLACE CATCH BASIN, DIRECTLY ADJACENT TO POST FOOTINGS, SO THAT LUNCH SHELTER DOWNSPOUT WILL SPILL DIRECTLY INTO CATCH BASIN.
(12) CONSTRUCT SYNTHETIC TURF AREA PER ARCHITECTURAL PLANS.
(13) REINSTALL IRRIGATION PEDESTAL SALVAGED DURING DEMOLITION.
(14) CONSTRUCT REDWOOD HEADER AT EXISTING FENCE PER DETAILS 5/2.01 AND 7/C3.00.
(15) INSTALL DRINKING FOUNTAIN PER DETAIL 8/2.01.
(16) CONSTRUCT EXTENSION OF WING WALL PER ARCHITECTURAL PLANS.

HATCH LEGEND:

- = EXISTING BUILDING
- = EXISTING CONCRETE TO BE PROTECTED
- = PROPOSED CONCRETE PAVEMENT (1)
- = PROPOSED PLAYGROUND SURFACING (2)
- = PROPOSED ASPHALT PAVEMENT (3)
- = PROPOSED TURF (6)
- = PROPOSED SYNTHETIC TURF (12)

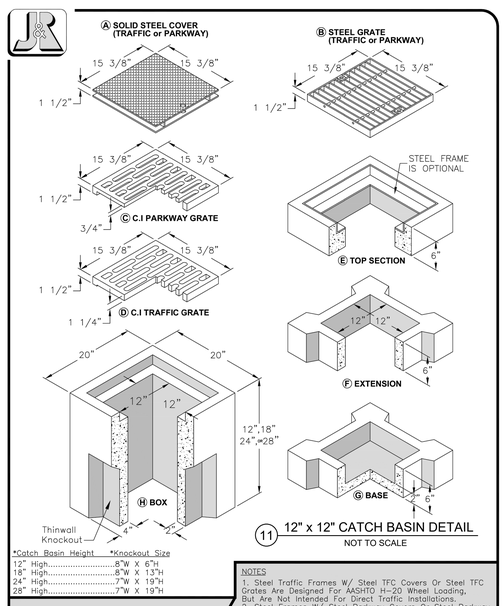


11 12" x 12" ADA - PARKWAY RATED GRATE DETAIL
NOT TO SCALE



12" X 12" STEEL PARKWAY GRATE per ADA SPECIFICATIONS

1. All steel shall conform to ASTM A36.
2. Grate conforms to ADA requirements.
3. Galvanizing is available upon request.
4. Structures are designed for 300p.s.f Pedestrian Loading.



*Catch Basin Height — *Knockout Size
12" High ..... 8"W X 6"H
18" High ..... 8"W X 13"H
24" High ..... 7"W X 19"H
28" High ..... 7"W X 19"H

11 12" x 12" CATCH BASIN DETAIL
NOT TO SCALE

CB1212 SERIES 12" X 12" CATCH BASIN

NOTES
1. Steel Traffic Frames W/ Steel TFC Covers Or Steel TFC Grates Are Designed For AASHTO H-20 Wheel Loading, But Are Not Intended For Direct Traffic Installations.
2. Steel Frames W/ Steel Parkway Covers Or Steel Parkway Grates, Are Designed For A Live Load Of 300 p.s.f.
3. Cast Iron Traffic Grates Are Designed For AASHTO H-10 Wheel Loading, But Are Not Intended For Direct Traffic Installations
4. Cast Iron Parkway Grates Are Designed For 300 p.s.f Wheel Loading.

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REGISTERED PROFESSIONAL ENGINEER ALAN W. COLLIER No. 74871 CIVIL STATE OF CALIFORNIA
Exp. 09/30/27

consultant

WILLIAM COLLIER ELEM SCHOOL SHADE STRUCTURE ADDITION & PLAYGROUND IMPROVEMENTS

LAKE ELSINORE UNIFIED SCHOOL DISTRICT
20150 MAYHALL DR.
WILDOMAR, CA. 92595

owner

tBP project number: 24006.00
file name:
drawn by: checked by:
date:

rev:	date:	description:
	07/02/26	DSA SUBMITTAL

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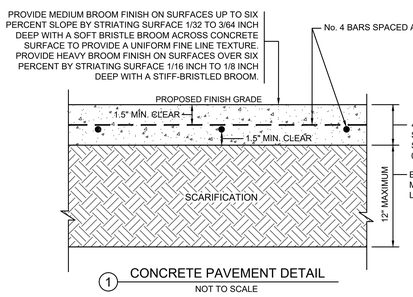
drawing title:

GRADING PLAN

drawing no.:

C2.00

Plot Date: 8/20/2026 5:21:43 PM Last Save By: ron.canedy Login: Madeline Chung S:\Jobs\2757 – TBP Architects\2757126 – William Collier ES\Civil\Shade Str\William Collier ES – C2.00 Grading Plan.dwg

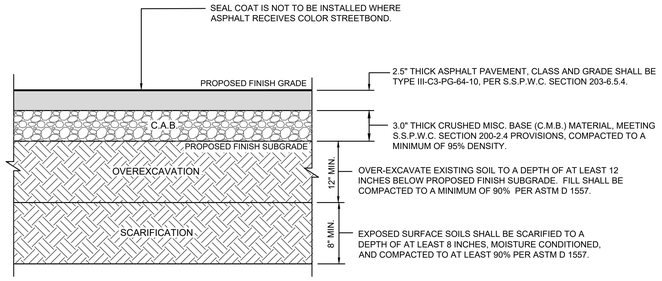


1 CONCRETE PAVEMENT DETAIL
NOT TO SCALE

FLOOD TEST NOTE:

BEFORE ACCEPTANCE, ALL NEW CONCRETE SHALL BE WATER TESTED TO ENSURE PROPER DRAINAGE AS DIRECTED BY THE INSPECTOR. THE CONTRACTOR SHALL PROVIDE WATER FOR THIS PURPOSE. THE FLOODING SHALL BE DONE BY WATER TANK TRUCK. DEPRESSIONS WHERE THE WATER PONDS TO A DEPTH OF MORE THAN 0.01 FOOT SHALL BE FILLED OR THE SLOPE CORRECTED TO PROVIDE PROPER DRAINAGE. THE EDGES OF THE FILL SHALL BE FEATHERED AND SMOOTHED SO THAT THE JOINT BETWEEN THE FILL AND THE ORIGINAL SURFACE IS INVISIBLE. PRACTICAL FIELD MEASUREMENT: 0.01 FOOT = TWO QUARTERS STACKED. NO STANDING WATER SHALL REMAIN AFTER 60 MINUTES ON A 70 DEGREE F (OR WARMER) DAY.

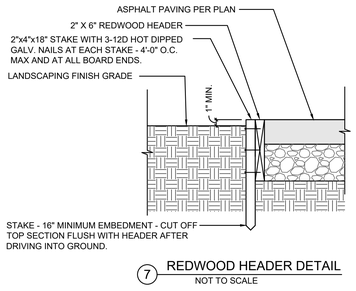
NOTE TO CONTRACTOR:
A. THE CONTRACTOR SHALL INSTALL EXPANSION AND CONTROL JOINTS IN CONCRETE FLATWORK AT LOCATIONS NOTED ON THE ARCHITECTURAL PLANS FOLLOWING DETAILS 'AA' THRU 'CC' HEREON.
B. CONTRACTOR SHALL FOLLOW DETAILS 'DD' THRU 'FF' HEREON WHEN CONSTRUCTING CONCRETE FLATWORK EDGE TREATMENTS.



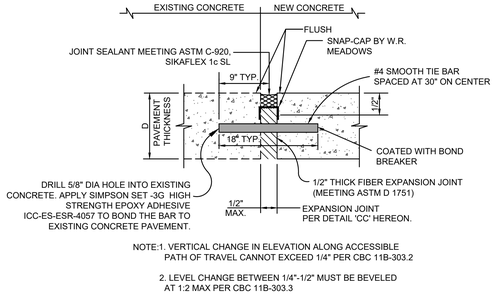
3 ASPHALT PAVEMENT DETAIL
NOT TO SCALE

FLOOD TEST NOTE:

BEFORE ACCEPTANCE, ALL NEW ASPHALT SHALL BE WATER TESTED TO ENSURE PROPER DRAINAGE AS DIRECTED BY THE INSPECTOR. THE CONTRACTOR SHALL PROVIDE WATER FOR THIS PURPOSE. THE FLOODING SHALL BE DONE BY WATER TANK TRUCK. DEPRESSIONS WHERE THE WATER PONDS TO A DEPTH OF MORE THAN 0.01 FOOT SHALL BE FILLED WITH TYPE E ASPHALT MIX OR THE SLOPE CORRECTED TO PROVIDE PROPER DRAINAGE. THE EDGES OF THE FILL SHALL BE FEATHERED AND SMOOTHED SO THAT THE JOINT BETWEEN THE FILL AND THE ORIGINAL SURFACE IS INVISIBLE. PRACTICAL FIELD MEASUREMENT: 0.01 FOOT = TWO QUARTERS STACKED. NO STANDING WATER SHALL REMAIN AFTER 60 MINUTES ON A 70 DEGREE F (OR WARMER) DAY. INSTALL FIRST COAT OF SEAL COAT ON ASPHALT BEFORE FLOOD TESTING OCCURS.



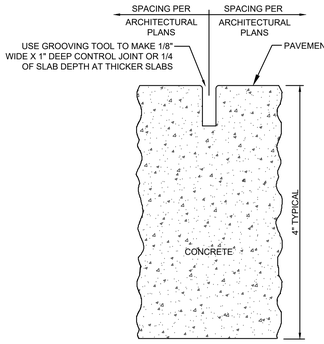
7 REDWOOD HEADER DETAIL
NOT TO SCALE



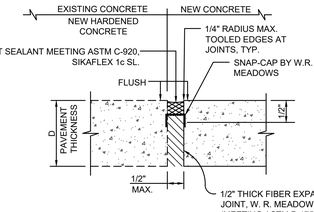
NOTE:1. VERTICAL CHANGE IN ELEVATION ALONG ACCESSIBLE PATH OF TRAVEL CANNOT EXCEED 1/4" PER CBC 11B-303.2

2. LEVEL CHANGE BETWEEN 1/4"-1/2" MUST BE BEVELED AT 1:2 MAX PER CBC 11B-303.3

AA EXPANSION JOINT (E.J.) WITH DOWEL
NOT TO SCALE

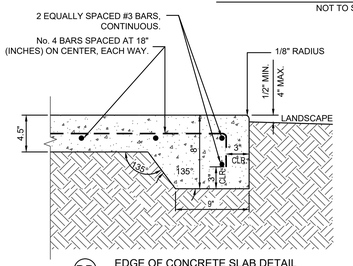


BB CONTROL JOINT (C.J.)
NOT TO SCALE

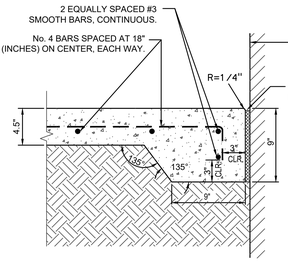


CC EXPANSION JOINT (E.J.)
NOT TO SCALE

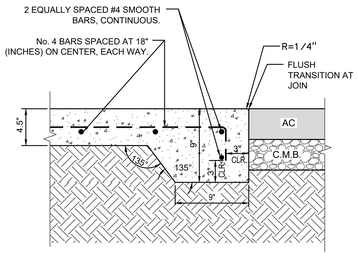
CONCRETE PAVEMENT DETAILS
NOT TO SCALE



DD EDGE OF CONCRETE SLAB DETAIL
WHERE CONCRETE MEETS SOFTSCAPE
NOT TO SCALE

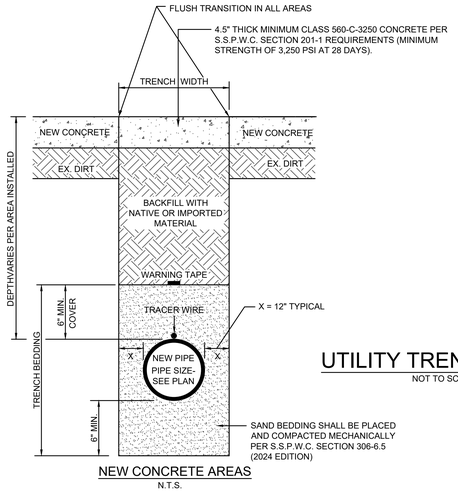


EE EDGE OF CONCRETE SLAB DETAIL
WHERE CONCRETE MEETS FACE OF BUILDING OR WALLS
NOT TO SCALE



FF EDGE OF CONCRETE SLAB DETAIL
WHERE CONCRETE MEETS HARDSCAPE
NOT TO SCALE

THE EXTENT THAT PEDESTRIAN SURFACES ARE TRENCHED AND PATCHED, THE PATH SHALL COMPLY WITH CBC 11B-302.1 & 11B-303.



UTILITY TRENCHING DETAIL
NOT TO SCALE

NEW CONCRETE AREAS
N.T.S.

TRENCH EXCAVATION, BEDDING, & BACKFILL NOTES:

EXCAVATION NOTE: THE 2025 CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH REGULATIONS (CAL/OSHA) WILL REQUIRE A PERMIT FOR THE CONSTRUCTION OF TRENCHES OR EXCAVATIONS WHICH ARE FIVE (5) FEET OR DEEPER AND INTO WHICH A PERSON IS REQUIRED TO DESCEND. FOR PERMIT PURPOSES, "DESCEND" MEANS TO ENTER ANY PART OF THE TRENCH OR EXCAVATION ONCE THE EXCAVATION HAS ATTAINED A DEPTH OF 5 FEET OR MORE. FOR REGULATIONS RELATING TO PERMITS FOR EXCAVATIONS AND TRENCHES, REFER TO THE CALIFORNIA CODE OF REGULATIONS TITLE 8, CHAPTER 3.2, ARTICLE 2, SECTION 341 OF THE CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH REGULATIONS (CAL/OSHA)

THE CONTRACTOR SHALL SUBMIT A DETAIL SHOWING THE DESIGN OR SHORING; BRACING SLOPING OR OTHER PROVISIONS TO BE MADE FOR WORKER PROTECTION FROM THE HAZARDS OF CAVING GROUND DURING THE EXCAVATION. THE PLAN SUBMITTED SHALL BE SIGNED BY A REGISTERED CIVIL OR STRUCTURAL ENGINEER CERTIFIED THAT THE PLAN COMPLIES WITH ALL OSHA CONSTRUCTION SAFETY ORDERS.

BEDDING MATERIAL SHALL BE COARSE SAND WITH SAND EQUIVALENT OF 30 OR GREATER. NO ANGULAR STONES OR PEA GRAVELS WILL BE ALLOWED IN PIPE BEDDING.

COMPACTION METHODS: ALL BEDDING & BACKFILL COMPACTION SHALL BE BY HAND-OPERATED, PLATE-TYPE, VIBRATORY, OR OTHER SUITABLE HAND-TAMPERS IN AREAS NOT ACCESSIBLE TO LARGER ROLLERS OR COMPACTERS. EXTREME CARE SHALL BE TAKEN TO AVOID DAMAGE TO CONDUITS, PIPES, AND ANY APPURTENANCES. BACKFILL DENSIFICATION BY INUNDATION OR JETTING SHALL NOT BE PERMITTED WITHOUT PRIOR WRITTEN APPROVAL FROM CIVIL ENGINEER. SAND BEDDING SHALL BE PLACED AND COMPACTED MEETING S.S.P.W.C. SECTION 306-6.5 PLACEMENT AND COMPACTION, 2021 EDITION.

SHEETING: WHEN EXCAVATION DEPTHS OR SOIL CONDITIONS REQUIRE SHORING OR USE OF A TRENCH BOX, THE BOTTOM OF THE SHORING OR TRENCH BOX SHOULD BE PLACED NO LOWER THEN THE TOP OF THE PIPE. THIS PREVENTS DISRUPTION OF THE BACKFILL ENVELOPE WHEN REMOVING THE SHORING OR TRENCH BOX. IF THIS PRACTICE CANNOT BE FOLLOWED, CONSIDERATION SHOULD BE GIVEN TO LEAVING THE SHORING IN PLACE.

GENERAL BACKFILL NOTES:

EXCAVATED TRENCH MATERIAL TO BE INSTALLED FOR BACKFILLING SHALL BE CLEAN, FREE OF LARGE CLODS AND STONES LARGER THAN 3-INCHES IN ANY DIMENSION. INSTALL BACKFILL MATERIALS IN LAYERS NOT TO EXCEED 8 TO 10-INCHES IN THICKNESS. COMPACT TO A MINIMUM 92% PER ASTM D1557.

IN LIEU OF USING NATIVE MATERIAL IN PAVED AREAS, THE USE OF A SLURRY BACKFILL MAY BE SUBSTITUTED. SAND SLURRY SHALL CONSIST OF 1.5 SACK PORTLAND CEMENT (CLASS 150-E-150) PER CUBIC YARD OF SAND SLURRY MIX. THE CONTRACTOR IS RESPONSIBLE FOR DISPOSAL OF ANY EXCESS BACKFILL MATERIAL FROM THE SITE.

WARNING TAPE NOTES (STORM DRAIN):

A METALLIC LINED TAPED FOR UNDERGROUND PIPES, MARKED "CAUTION BURIED STORM DRAIN LINE BELOW", IN POLYETHYLENE FILM COLOR GREEN, INSTALLED ABOVE PIPE, 6" WIDE.

TRACER WIRE NOTES:

COPPER TRACER WIRE SHALL BE INSTALLED ON ALL NON-METALLIC PIPELINES, 2" AND GREATER, JUST ABOVE THE HORIZONTAL CENTERLINE OF THE PIPE. THE COPPER WIRE SHALL BE TYPE THWN #12 AWG GAUGE FOR SEWER, STORM & POTABLE WATER, #14 AWG GAUGE FOR IRRIGATION PIPES AND #18 AWG GAUGE FOR POLYETHYLENE GAS LINES. ALL TRACER WIRE SHALL HAVE HEAT AND MOISTURE RESISTANT INSULATION.

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WILLIAM COLLIER ELEM SCHOOL SHADE STRUCTURE ADDITION & PLAYGROUND IMPROVEMENTS

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WILDOMAR, CA. 92595

owner

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drawing title:

DETAIL SHEET

drawing no.:

C3.00

Plot Date: 8/20/2026 5:21:50 PM Last Save By: madeline.chung Login: Madeline Chung S:\Jobs\2757 - TBP Architects\2757f26 - William Collier ES\Civil\Shade Str\William Collier ES - C3.00 Detail Sheet.dwg

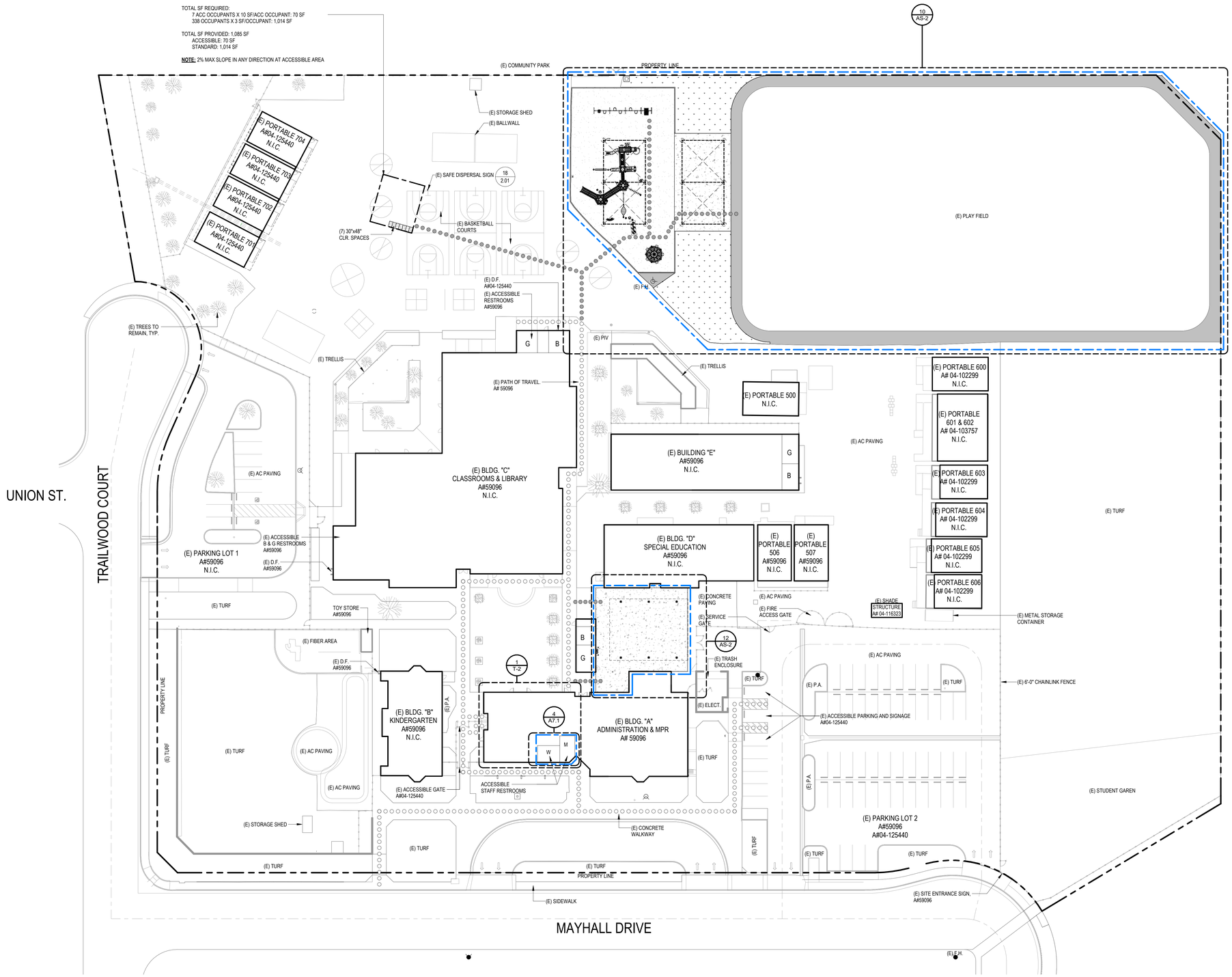
SAFE DISPERSAL AREA

TOTAL OCCUPANTS: 345
ACC OCCUPANTS (2% OF TOTAL): 7
STANDARD OCCUPANTS: 338

TOTAL SF REQUIRED:
7 ACC OCCUPANTS X 10 SF/ACC OCCUPANT: 70 SF
338 OCCUPANTS X 3 SF/OCCUPANT: 1,014 SF

TOTAL SF PROVIDED: 1,085 SF
ACCESSIBLE: 70 SF
STANDARD: 1,014 SF

NOTE: 2% MAX SLOPE IN ANY DIRECTION AT ACCESSIBLE AREA



GENERAL NOTES

1. LOCATIONS OF ALL UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR SHALL EXERCISE EXTREME CAUTION IN EXCAVATING AND TRENCHING TO AVOID INTERCEPTING EXISTING PIPING OR CONDUITS. THE ARCHITECT IS NOT RESPONSIBLE FOR THE LOCATION OF UNDERGROUND UTILITIES OR STRUCTURES WHETHER OR NOT SHOWN OR DETAILED AND INSTALLED BY OTHER CONTRACTS. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER SHOULD SUCH UNIDENTIFIED CONDITIONS BE DISCOVERED. THESE DRAWINGS DO NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY.
2. VERIFY ALL EXISTING AND FINISH GRADES, DIMENSIONS AND SITE CONDITIONS BEFORE COMMENCING WORK AND REPORT ANY DISCREPANCIES TO THE ARCHITECT.

LEGEND

- (E) PATH OF TRAVEL, A#59096, A#04-125440
- PATH OF TRAVEL

1. **DESIGN PROFESSIONAL IN GENERAL RESPONSIBLE CHARGE STATEMENT:** THE PATH OF TRAVEL (P.O.T.) IDENTIFIED IN THESE CONSTRUCTION DOCUMENTS MEETS THE REQUIREMENTS OF THE CURRENT EDITION OF THE 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 P.O.T. WAS EXAMINED AND ANY ELEMENTS, COMPONENTS OR PORTIONS OF THE P.O.T. 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 NON-COMPLIANT ELEMENTS, COMPONENTS OR PORTIONS OF THE P.O.T. 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 P.O.T. ITEMS WITHIN SCOPE OF THE PROJECT REPRESENTED AS CBC COMPLIANT ARE FOUND TO BE NON-CONFORMING BEYOND CONVENTIONAL INDUSTRY TOLERANCES, THE ITEMS SHALL BE BROUGHT INTO COMPLIANCE WITH THE CBC AS PART OF THIS PROJECT BY MEANS OF A CONSTRUCTION CHANGE DOCUMENT.
2. THE ACCESSIBLE PATH OF TRAVEL AS INDICATED ON PLAN IS A BARRIER FREE ACCESS ROUTE WITHOUT ANY ABRUPT LEVEL CHANGES EXCEEDING 1/2" BEVELED AT 1:2 MAX SLOPE OR VERTICAL LEVEL CHANGE NOT EXCEEDING 1/4" MAX AND AT LEAST 48" WIDE. SURFACE IS SLIP RESISTANT, STABLE, FIRM AND SMOOTH. CROSS SLOPE DOES NOT EXCEED 2% AND SLOPE IN THE DIRECTION OF TRAVEL IS LESS THAN 5% UNLESS OTHERWISE INDICATED.
3. CONTRACTOR TO VERIFY THAT ALL BARRIERS IN THE PATH OF TRAVEL HAVE BEEN REMOVED OR WILL BE REMOVED UNDER THIS PROJECT, AND PATH OF TRAVEL COMPLIES WITH CBC 11338. VERIFY ALL EXISTING AND FINISH GRADES, DIMENSIONS AND SITE CONDITIONS BEFORE COMMENCING WORK AND REPORT ANY DISCREPANCIES TO THE ARCHITECT.

- (E) PROPERTY LINE
- LIMIT OF WORK
- (E) BUILDING(S) NOT PART OF THIS CONTRACT
- AC PAVING, SEE CIVIL DRAWINGS
- CONCRETE PAVING, SEE CIVIL DRAWINGS
- ARTIFICIAL TURF, SEE CIVIL DRAWINGS
- (E) TREE, PROTECT IN PLACE

SHADE CALCULATIONS

SURAFCE PARKING AREA: N/A (EXISTING PARKING TO REMAIN)

HARDSCAPE AREA: 16,246 SF (NEW HARDSCAPE AREA) x 20% = 3,249 SF (REQUIRED SHADE AREA)
PROVIDED: 4,264 SF *5.106.12.3 EXCEPTION 1
NOTE: METAL SHADE STRUCTURE ROOFING MATERIALS COMPLY WITH TABLE A5.106.11.2.2, ROOF SLOPE ≤2:12

LANDSCAPE AREA: N/A (NEW DESIGNATED PLAY AREA) *5.106.12.2 EXCEPTION

PARKING TABULATION

(E) PARKING LOT 2

EXISTING PARKING SPACES:	57 SPACES TOTAL
ACCESSIBLE PARKING SPACES REQUIRED (CBC 11B-208.2): VAN ACCESSIBLE PARKING SPACES REQUIRED (CBC 11B-208.2.4):	3 SPACES TOTAL 1 SPACE
ACCESSIBLE PARKING SPACES PROVIDED: VAN ACCESSIBLE PARKING SPACES PROVIDED:	3 SPACES TOTAL 1 SPACE

NORTH

SCALE: 1" = 30'-0"

OVERALL SITE PLAN

1

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agency

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architect

consultant

WILLIAM COLLIER ELEM SCHOOL SHADE STRUCTURE ADDITION & PLAYGROUND IMPROVEMENTS

LAKE ELSINORE UNIFIED SCHOOL DISTRICT
20150 MAYHALL DR.
WILDOMAR, CA. 92595

owner

tBP project number: 24006.00
file name:
drawn by: Z.B. checked by: K.W.
date: 8/20/2026 4:23:15 PM

rev:	date:	description:
	07/02/26	DSA SUBMITTAL

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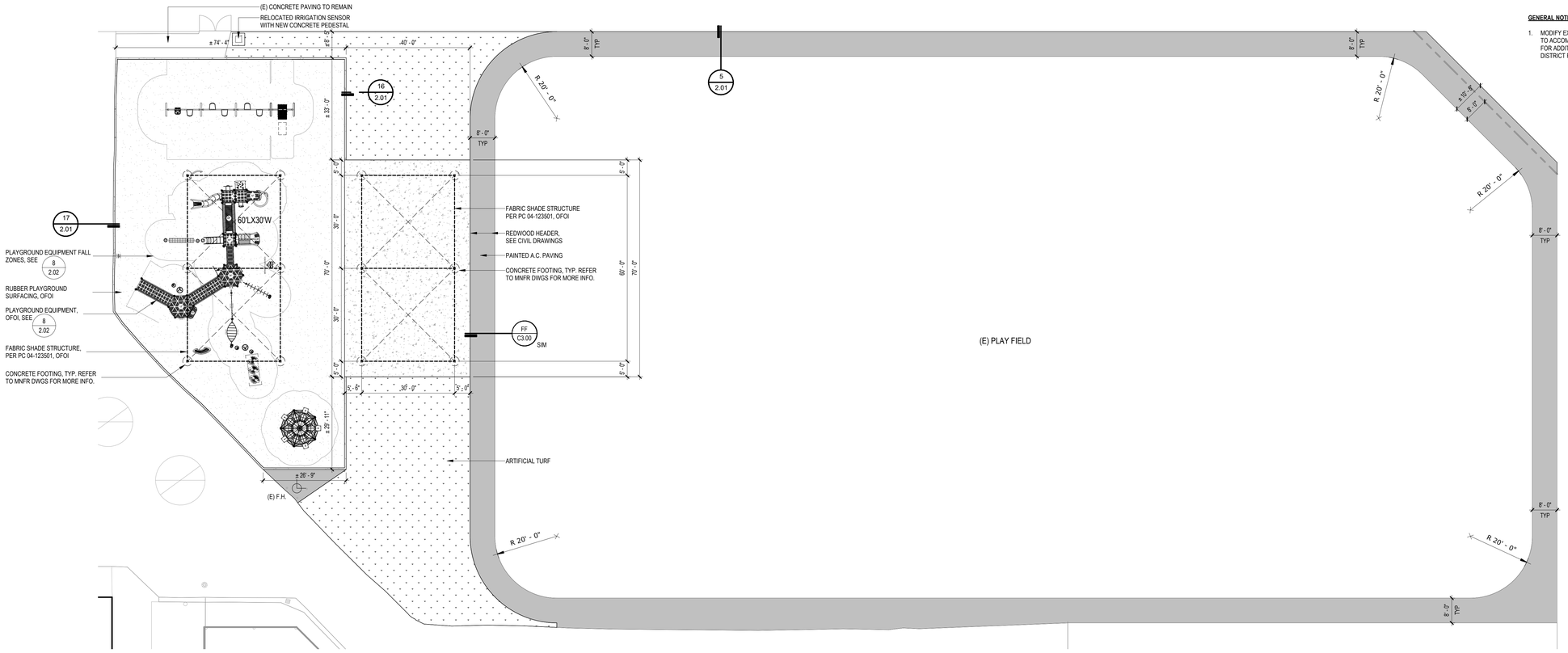
drawing title:

OVERALL SITE PLAN

drawing no.:

AS-1

G:\24006.00 LESD\ William Collier ES Shade Structure Addition\Drawings\00 CURRENT Revit\User Models\William Collier ES Site Improv_Central_EE.rvt



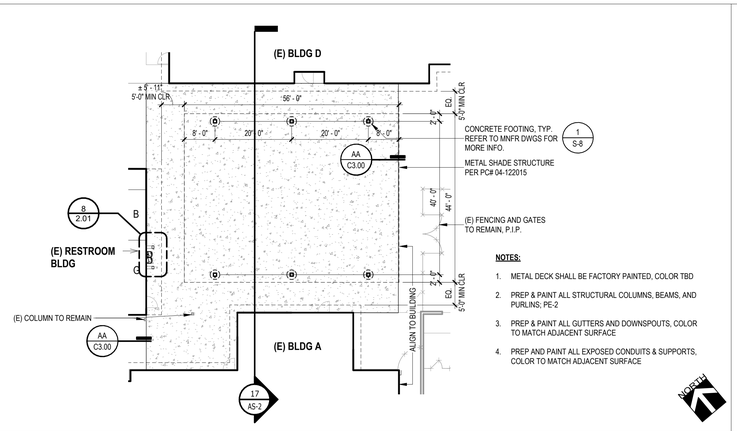
GENERAL NOTES:

1. MODIFY EXISTING IRRIGATION SYSTEM AS REQUIRED TO ACCOMODATE IMPROVEMENTS. REFER TO C1.00 FOR ADDITIONAL INFORMATION. COORDINATE WITH DISTRICT FOR ADDITIONAL REQUIREMENTS.

NORTH

ENLARGED SITE PLAN - PLAYGROUND AND TRACK

SCALE: 1/16" = 1'-0" | 10



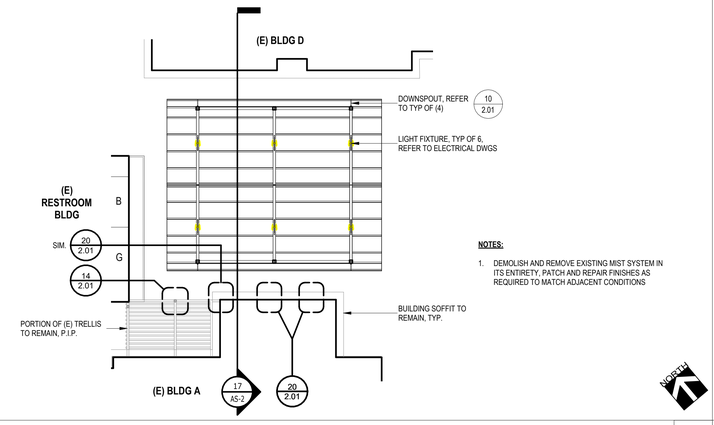
NOTES:

1. METAL DECK SHALL BE FACTORY PAINTED, COLOR TBD
2. PREP & PAINT ALL STRUCTURAL COLUMNS, BEAMS, AND PURLINS; PE-2
3. PREP & PAINT ALL GUTTERS AND DOWNSPOUTS, COLOR TO MATCH ADJACENT SURFACE
4. PREP AND PAINT ALL EXPOSED CONDUITS & SUPPORTS, COLOR TO MATCH ADJACENT SURFACE

NORTH

ENLARGED SITE PLAN - LUNCH SHELTER

SCALE: 1/16" = 1'-0" | 12



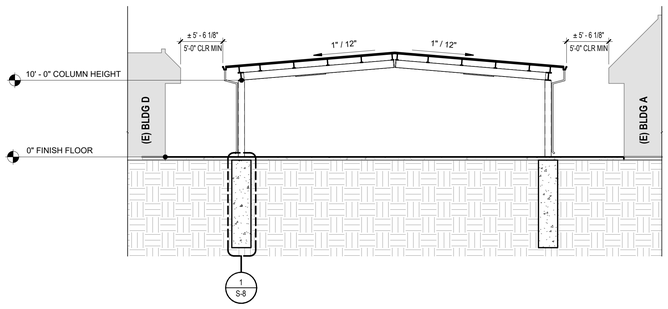
NOTES:

1. DEMOLISH AND REMOVE EXISTING MIST SYSTEM IN ITS ENTIRETY, PATCH AND REPAIR FINISHES AS REQUIRED TO MATCH ADJACENT CONDITIONS

NORTH

ENLARGED SITE RCP - LUNCH SHELTER

SCALE: 1/16" = 1'-0" | 14



LUNCH SHELTER - TRANSVERSE SECTION

SCALE: 1/8" = 1'-0" | 17

S:\24006.00 LCSD William Collier ES Shade Structure Addition\Drawings\00 CURRENT Rev\Issue Models\William Collier ES Site Improv_Central_EE.rvt

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APP: 04-125584 INC:
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SS ☑ FLS ☑ ACS ☑
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DIVISION OF THE STATE ARCHITECT
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DSA Application Number: 04-125584
DSA File Number: 33-15

agency

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architecture
planning
interiors

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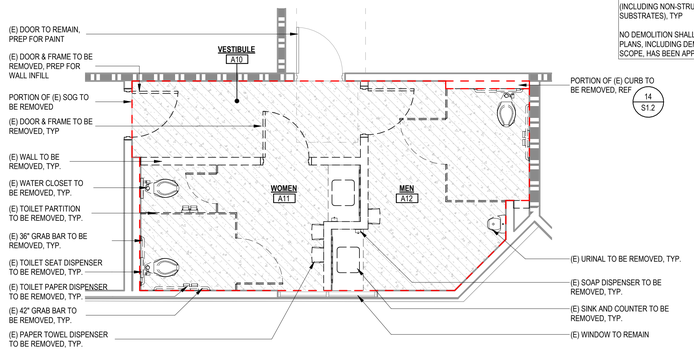
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drawing title:

ENLARGED SITE PLANS

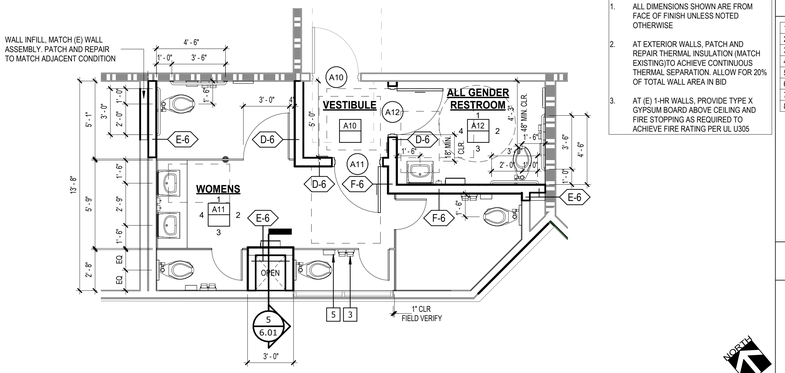
drawing no.:

AS-2



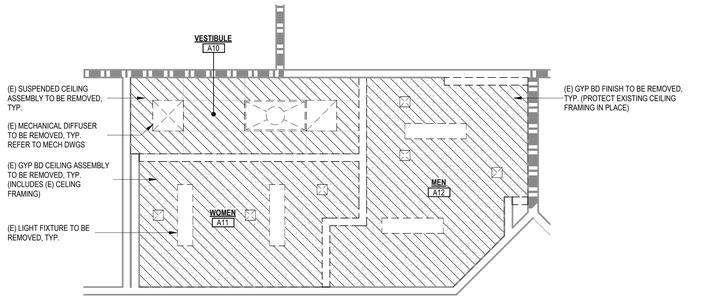
(E) BLDG A - ENLARGED RESTROOM PLAN - A11 & A12 - DEMO

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



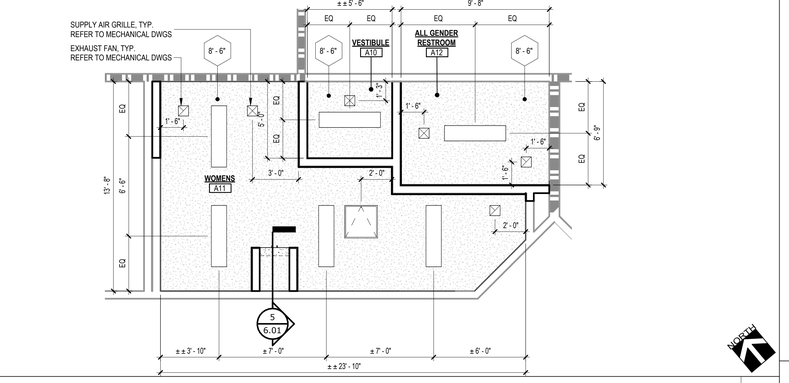
(E) BLDG A - ENLARGED RESTROOM PLAN - A11 & A12 - MODERNIZATION

SCALE: 1/4" = 1'-0" | 4



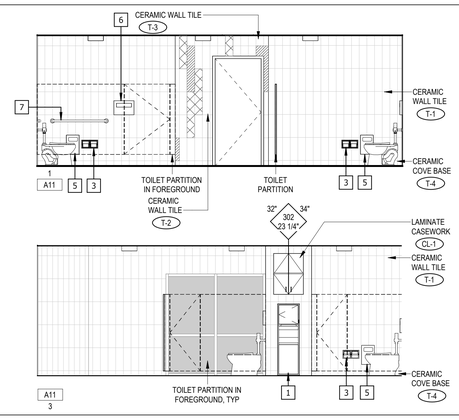
(E) BLDG A - ENLARGED RESTROOM RCP - A11 & A12 - DEMO

SCALE: 1/4" = 1'-0" | 7



(E) BLDG A - ENLARGED RESTROOM RCP - A11 & A12 - MODERNIZATION

SCALE: 1/4" = 1'-0" | 9

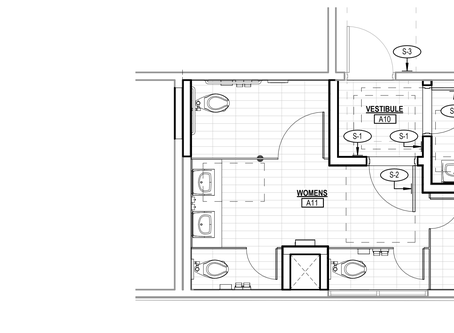


MOD. BLDG A STAFF RESTROOM - WOMEN

SCALE: 1/4" = 1'-0" | 12

MOD. BLDG A STAFF RESTROOM - ALL GENDER

SCALE: 1/4" = 1'-0" | 14



(E) BLDG A - ENLARGED RESTROOM PLAN - A11 & A12 - FINISH / SIGNAGE

SCALE: 1/4" = 1'-0" | 17

EXISTING WALL ASSEMBLY, PROTECT IN PLACE UNLESS NOTED OTHERWISE

EXISTING 1-HR WALL ASSEMBLY, PROTECT IN PLACE UNLESS NOTED OTHERWISE

INTERIOR NON-RATED WALL ASSEMBLY, SEE WALL TYPE TAG ON FLOOR PLAN(S)

XXX — WALL TYPE, SEE SHEET 6.01 FOR WALL TYPES

XXX — DOOR TAG, SEE SHEET 8.01 FOR SCHEDULE & DETAILS

ACCESSIBLE WORKSTATION / CLEAR SPACE, 30" x 48"

FLOOR DRAIN, REFER TO PLUMBING DRAWINGS

S-1 — RESTROOM SIGNAGE, SEE DOOR SCHEDULE AND 17 8.01, 18 8.01

S-2 — RESTROOM DOOR SIGNAGE, SEE DOOR SCHEDULE AND 12 8.01, 13 8.01

S-3 — RESTROOM SIGNAGE, SEE DOOR SCHEDULE AND 20 6.01

12'-0" — CEILING HEIGHT ABOVE FIN. FLOOR

GYPSUM BOARD CEILING

24" x 24" CEILING ACCESS DOOR, SEE 19 8.01

EXIT SIGN, REFER TO ELECTRICAL DRAWINGS

LIGHT FIXTURE, REFER TO ELECTRICAL DRAWINGS

AIR SUPPLY DIFFUSER, REFER TO MECHANICAL DRAWINGS

AIR RETURN DIFFUSER, REFER TO MECHANICAL DRAWINGS

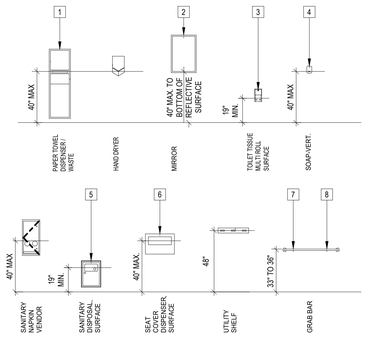
AIR EXHAUST DIFFUSER, REFER TO MECHANICAL DRAWINGS

LEGEND MODERNIZATION

TOILET ACCESSORY KEYNOTES

1	RECESSED CONVERTIBLE COMBO TOWEL AND WASTE, B-3961
2	MIRROR, STAINLESS STEEL FRAMED, 18X30, B-165
3	SURFACE MOUNTED TOILET TISSUE DISPENSER, B-4288
4	SURFACED MOUNTED SOAP DISPENSER, B-2111
5	SURFACE MOUNTED SANITARY NAPKIN DISPOSAL, B-354
6	SURFACE MOUNTED TOILET SEAT COVER DISPENSER, B-221
7	42" GRAB BAR, B-6806
8	36" GRAB BAR, B-6806

TOILET ACCESSORY MOUNTING HEIGHTS



NOTES:

1. MOUNTING HEIGHTS SHOWN ARE TYPICAL, UNLESS OTHERWISE NOTED.
2. ALL ACCESSORIES SHALL BE ACCESSIBLE WITH A MAXIMUM REACH HEIGHT OF 40" ABOVE FINISH FLOOR.
3. SLOPE FLOORS 1/8" PER FOOT MINIMUM AND 1/4" PER FOOT MAXIMUM, UNLESS NOTED OTHERWISE.
4. SEE ENLARGED TOILET PLAN AND INTERIOR ELEVATION DRAWINGS FOR TOILET ACCESSORY LOCATIONS
5. AT NON-SHEAR WALLS, PROVIDE BACKING FOR GRAB BARS AND SHELVES PER 19 / 6.01
6. AT (E) SHEAR WALLS, PROVIDE BACKING FOR GRAB BARS AND SHELVES PER 13 / S1.2

TOILET FIXTURE MOUNTING HEIGHTS

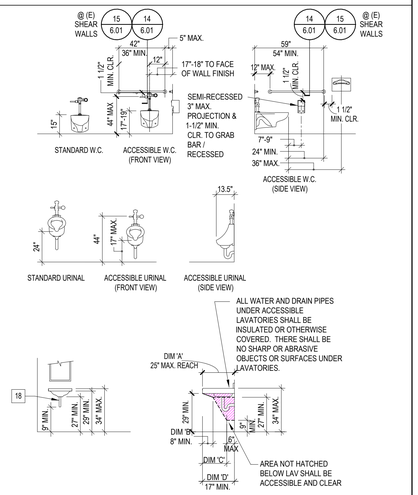


TABLE TO REFLECT CBC 11B-306.3.4

DIM. 'A'	DIM. 'B'	DIM. 'C'	DIM. 'D'
17"	8"	11"	17"
18"	9"	12"	18"
19"	10"	13"	19"
20"	11"	14"	20"

TABLE TO REFLECT CBC 11B-306.3.4

DIM. 'A'	DIM. 'B'	DIM. 'C'	DIM. 'D'
21"	12"	15"	21"
22"	13"	16"	22"
23"	14"	17"	23"
24"	15"	18"	24"
25"	16"	19"	25"

CLEARANCES OF FIXTURES & ACCESSORIES TO FINISHED SURFACE

	ADULT
TOILET CENTERLINE FROM WALL	17"-18"
TOILET SEAT HEIGHT (AT SEAT LID)	17"-19"
GRAB BAR HEIGHT (SIDE) (TOP OF GRAB BAR)	33"-36"
TOILET PAPER IN FRONT OF TOILET	7"-9"
NAPKIN DISPOSAL IN FRONT OF TOILET	12" MAX.
DISPENSER OR MIRROR HEIGHT	40" MAX.
LAVATORY/SINK TOP HEIGHT	34" MAX.
LAVATORY/SINK KNEE CLEARANCE	27" MIN., 29" MAX.
URINAL LIP HEIGHT	17" MAX.
URINAL FLUSH HANDLE HEIGHT	44" MAX.
LOW DRINKING FOUNTAIN BUBBLER HEIGHT	36" MAX.
DRINKING FOUNTAIN KNEE CLEARANCE	27" MIN.
RAMP/STAIR HANDRAIL HEIGHT	34"-38"

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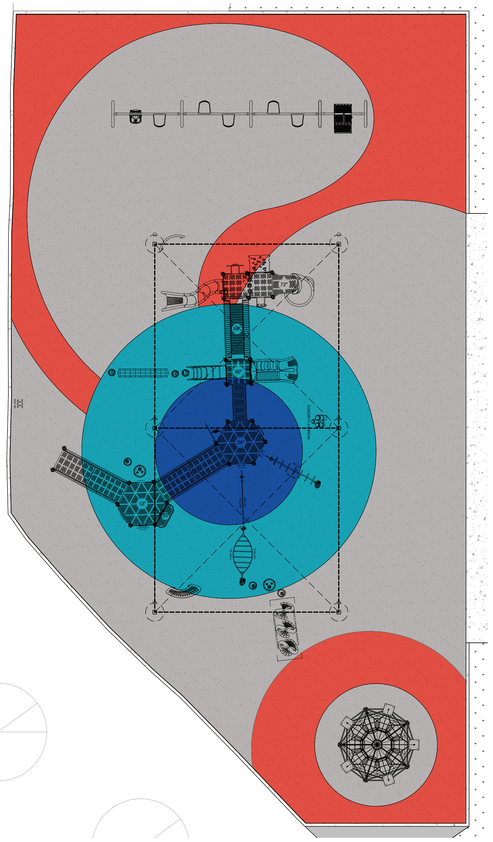
ENLARGED RESTROOM PLANS

drawing no.:

A7.1

S:\24006.00 LESD William Collier ES Shade Structure Addition\Drawings\00 CURRENT Revit\Size Model\William Collier ES Site Imgrov - Central - EE.rvt

COLORS PER PRO-TECT TURF RUBBER PLAYGROUND SURFACING:
082 BRIGHT RED
134 TURQUOISE BLUE
054 DARK BLUE
065 GREY



NORTH

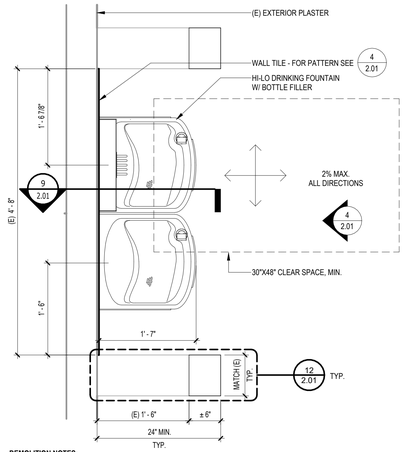
ENLARGED PLAYGROUND AREA - COLOR PATTERN

SCALE: 1" = 10'-0" | 7

NOTE:
11B-602.6 WATER FLOW
THE SPOUT SHALL PROVIDE A FLOW OF WATER 4 INCHES HIGH MINIMUM AND SHALL BE LOCATED 5 INCHES MAXIMUM FROM THE FRONT OF THE UNIT.

IF THE SPOUT IS LOCATED LESS THAN 3 INCHES FROM THE FRONT OF THE UNIT, THE ANGLE OF THE STREAM SHALL BE 30 DEGREES MAXIMUM.

WHERE LOCATED BETWEEN 3 INCHES AND 5 INCHES FROM THE FRONT OF THE UNIT, THE ANGLE OF THE STREAM SHALL BE 15 DEGREES MAXIMUM RELATIVE TO THE FRONT FACE (ORIENTATION OF WALL SURFACE)

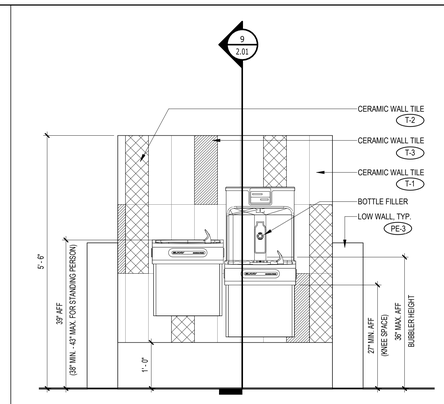


DEMOLITION NOTES:

1. PARTIALLY REMOVE (E) CEMENT PLASTER FINISH AND TILE WAINSCOT.
2. PROTECT IN-PLACE (E) WALL FRAMING.
3. PATCH AND REPAIR AREAS AFFECTED DURING THE INSTALLATION OF DRINKING FOUNTAIN AND RAILING. RESTORE TO ORIGINAL CONDITION INCLUDING AND NOT LIMITED TO TILE, PAINT, PLASTER, AND CONCRETE.

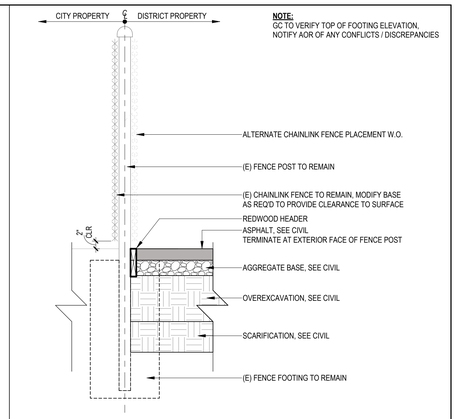
ENLARGED PLAN AT DRINKING FOUNTAIN

SCALE: 1" = 1'-0" | 8



DRINKING FOUNTAIN ELEVATION

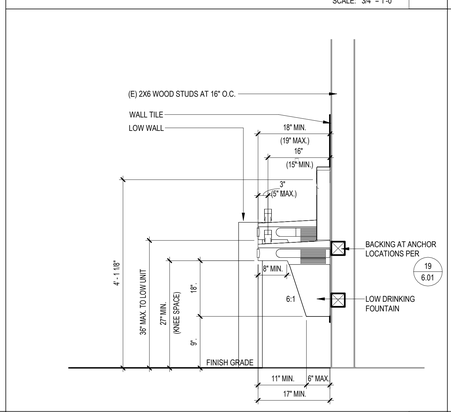
SCALE: 3/4" = 1'-0" | 4



NOTE:
GC TO VERIFY TOP OF FOOTING ELEVATION. NOTIFY AOR OF ANY CONFLICTS / DISCREPANCIES

ASPHALT AT (E) FENCE POST FOOTINGS

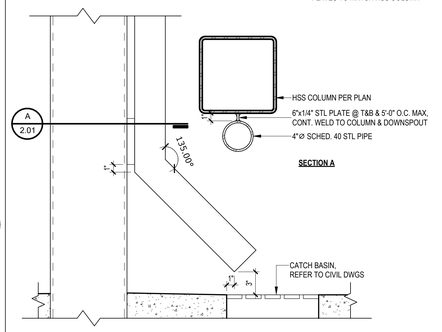
SCALE: 3/4" = 1'-0" | 5



DRINKING FOUNTAIN SECTION

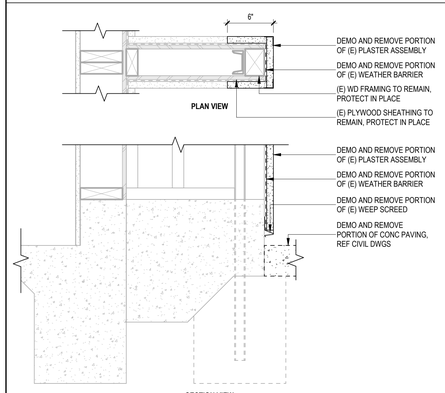
SCALE: 3/4" = 1'-0" | 9

NOTE: PREP & PAINT SUPPORT PLATES TO MATCH HSS COLUMN



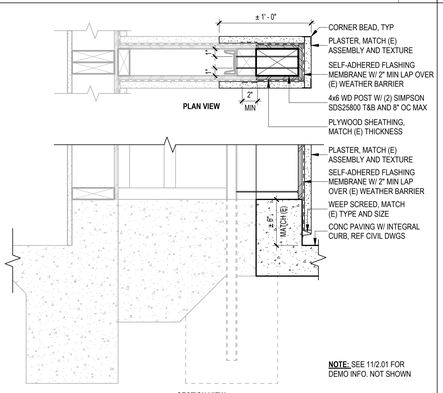
TYP DOWNSPOUT @ METAL SHADE STRUCT.

SCALE: 1 1/2" = 1'-0" | 10



DF WING WALL EXTENSION - DEMO

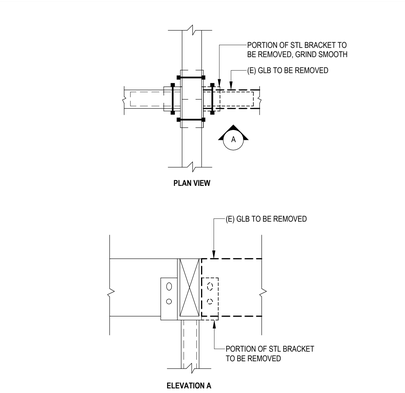
SCALE: 1 1/2" = 1'-0" | 11



NOTE: SEE 11/2.01 FOR DEMO INFO. NOT SHOWN

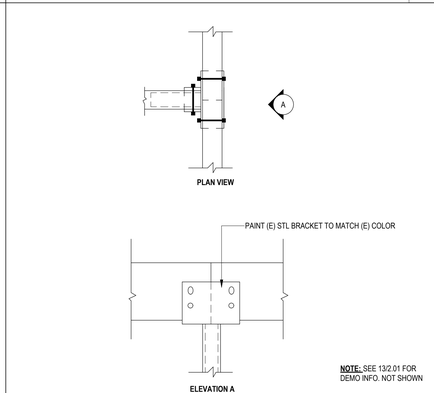
DF WING WALL EXTENSION - MOD

SCALE: 1 1/2" = 1'-0" | 12



TRELLIS REMOVAL - DEMO

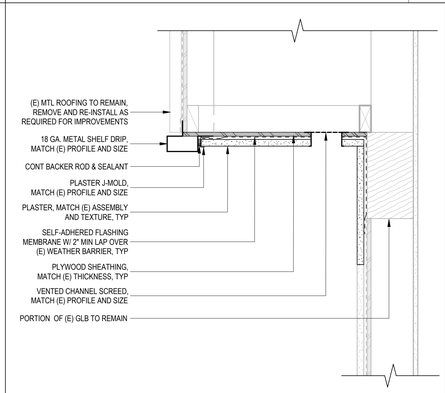
SCALE: 1" = 1'-0" | 13



NOTE: SEE 13/2.01 FOR DEMO INFO. NOT SHOWN

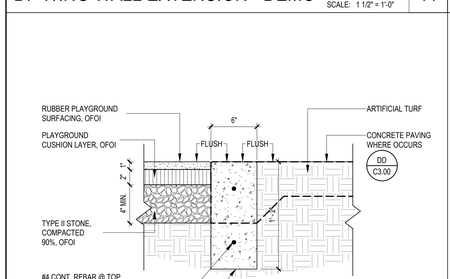
TRELLIS REMOVAL - MOD

SCALE: 1" = 1'-0" | 14



TRELLIS REMOVAL @ BLDG - SECTION

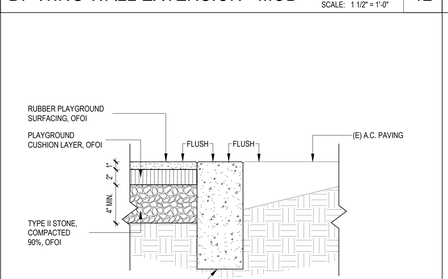
SCALE: 1 1/2" = 1'-0" | 15



NOTE:
RUBBER PLAYGROUND SURFACE MATERIAL IS REQUIRED TO COMPLY WITH ASTM F1951 AND ASTM F1292 PER 11B-1008.2.6.

PLAYGROUND SURF. EDGE TRANSITION

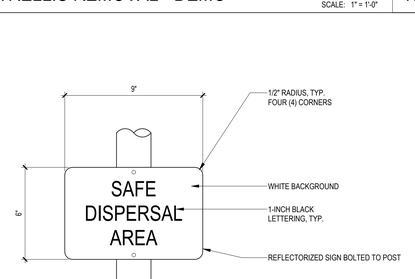
SCALE: 1 1/2" = 1'-0" | 16



NOTE:
RUBBER PLAYGROUND SURFACE MATERIAL IS REQUIRED TO COMPLY WITH ASTM F1951 AND ASTM F1292 PER 11B-1008.2.6.

PLAYGROUND SURF. EDGE TRANSITION

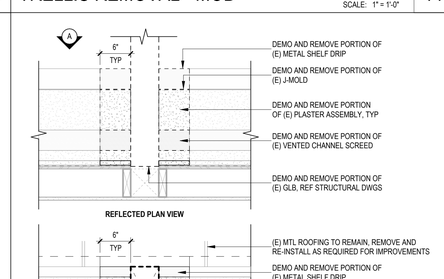
SCALE: 1 1/2" = 1'-0" | 17



NOTE: FOR REFERENCE ONLY

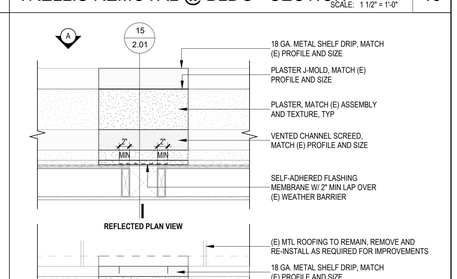
(E) SAFE DISPERSAL SIGN

SCALE: 3" = 1'-0" | 18



TRELLIS REMOVAL @ BLDG - DEMO

SCALE: 1" = 1'-0" | 19



NOTES:
1. SEE 19/2.01 FOR DEMO INFO. NOT SHOWN
2. PAINT ALL IMPROVEMENTS TO MATCH ADJACENT CONDITION

TRELLIS REMOVAL @ BLDG - MOD

SCALE: 1" = 1'-0" | 20

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APP: 04-125584 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 09/01/2026

DIVISION OF THE STATE ARCHITECT

109 VIA FRONTERA, SUITE 300
SAN DIEGO, CA 92127
ph: 858.674.5400 fx: 858.674.5471

DSA Application Number: 04-125584
DSA File Number: 33-15

agency

tBP architecture planning interiors

LICENSED ARCHITECT GREG L. GREIG NO. C34187 REN. 4-30-27 STATE OF CALIFORNIA

tBP/Architecture
3990 Concours Street, Suite 201
Ontario, CA 91764
ph: 909.635.6366 fx: 949.732.3895

architect

consultant

WILLIAM COLLIER ELEM SCHOOL SHADE STRUCTURE ADDITION & PLAYGROUND IMPROVEMENTS

LAKE ELSINORE UNIFIED SCHOOL DISTRICT
20150 MAYHALL DR.
WILDOMAR, CA. 92595

owner

tBP project number: 24006.00
file name:
drawn by: Z.B. checked by: K.W.
date: 8/20/2026 4:23:32 PM

rev:	date:	description:
	07/02/26	DSA SUBMITTAL

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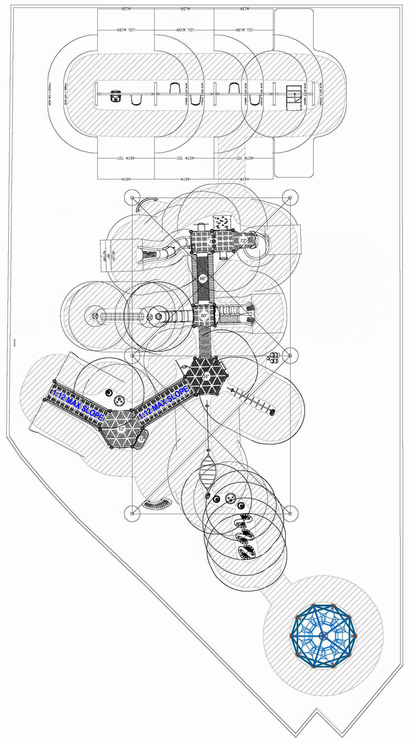
drawing title:

SITE AND MISC. EXTERIOR DETAILS

drawing no.:

2.01

S:\24006.00 LESD William Collier ES Shade Structure Addition\Drawings\00 CURRENT Revit\Use Models\William Collier ES Site Improv_Central_EE.rvt



NOTE:
FOR PLAYGROUND FOOTING DETAILS REFER TO 18 / 2.02

5 / 2.02

Title of Project:	William Collier CD#25596					
Model Number	Description	Ground/ Elevated	Elevated and accessible by ramp or transfer	Type of Ground	Qty	
ZSPA8408	THEORBO	Elevated	YES	N/A	1	
ZSPA4406	ACCESSIBLE ORBIT PANEL	Elevated	YES	N/A	1	
ZSPA4407	TRIPOLI RET.WALL PANEL	Elevated	YES	N/A	1	
ZSJA4819	MOVE IT PANEL	Elevated	YES	N/A	1	
ZSPA2737	RUMBLEBERG'S(60in DECK)	Elevated	YES	N/A	1	
ZSPA3421	CHAINLINK CREEK DIPTILE DECK	Elevated	YES	N/A	1	
ZSPA3537	SLICED, NUMCHKD SPIRAL SLIDE	Elevated	YES	N/A	1	
ZSPA6090	10ft CLIMB Mt	Elevated	YES	N/A	1	
ZSPA6089	CLIFFHANGER(INCLINETS)(72in DECK)	Elevated	YES	N/A	1	
ZSPA7128	ANGLED CLIMBER PANEL(72in DECK)	Elevated	YES	N/A	1	
ZSPA7430	DEEP REACH(4+CLIMBERS)(60in DECK)	Elevated	NO	N/A	1	
ZSPA7940	SLOCLIMBER(24in DECK)	Elevated	YES	N/A	1	
ZSPA8136	SEPARATING CLIMBERS(72in DECK)	Elevated	YES	N/A	1	
ZSPA8210	TIRED CLIMBER(72in DECK)	Elevated	YES	N/A	1	
ZSPA9490	THE SKYLINK	Elevated	YES	N/A	1	
ZSJA7137	LINEY'S STEP'S 5ft	Elevated	YES	N/A	1	
ZSPA8149	STEP RAIL(5-6)	Ground	N/A	BALANCE	2	
ZSJA7136_7	LINEY'S STEP'S 5ft	Ground	N/A	BALANCE	3	
ZSJA7140,8	STEPS(RAMP'S)_BUTTONS	Ground	N/A	BALANCE	3	
ZSPA8398	THE HELIX	Ground	N/A	CLIMBING	1	
ZSJA6737_5,6	1PAYRL#ANDCLIMBERS(36",48", 60")	Ground	N/A	CLIMBING	3	
ZSPA9390	TIC-TAC-TOE(ACTIVITY WALL)	Ground	N/A	NOT ACCESSIBLE	1	
ZSPA9409	ACCESSIBLE(BLOCK)PANEL	Ground	N/A	NOT ACCESSIBLE	1	
ZSJA4618	ELOCA'S SEQUEFTAR'S	Ground	N/A	NOT ACCESSIBLE	1	
ZSPA6490	POST MOUNT DRUM 1	Ground	N/A	NOT ACCESSIBLE	1	
ZZ00031	ARCH SWING	Ground	N/A	SWINGING	7	
ZZ00064	CONCERTO-CONGAS	Ground	N/A	MUSIC	1	
ZZ00057	CONCERTO-HABIB	Ground	N/A	MUSIC	1	
ZZJA7100	BIDEWALK	Ground	N/A	BALANCE	1	
ZZ00055	CONCERTO-VIBES	Ground	N/A	MUSIC	1	
	VARIC	Ground	N/A	CLIMBING	1	
	Total elevated play components:	16				
	Total accessible elevated play components:	16		Required: 0		
	Total accessible ground level components shown:	29		Required: 0		
	Total accessible ground level components of different t	4		Required: 0		

TOTAL ELEVATED PLAY COMPONENTS: 16
TOTAL ACCESSIBLE ELEVATED PLAY COMPONENTS : 16 REQUIRED: 0
TOTAL ACCESSIBLE GROUND LEVEL COMPONENTS SHOWN: 29 REQUIRED: 0
TOTAL ACCESSIBLE GROUND LEVEL COMPONENTS OF DIFFERENT TYPES: 4 REQUIRED: 0
* APPLICABLE ONLY WITH ADA COMPLIANT BAR HOMO.

PLAY STRUCTURE AND LAYOUT OF THE COMPONENTS CONFORM TO ASTM F1487-25 AND CPSC #325 GUIDELINES AND CCR TITLE 22, DIVISION 4 CHAPTER 22.
CRITICAL FALL HEIGHT OF OVERALL PLAY AREA: 96"

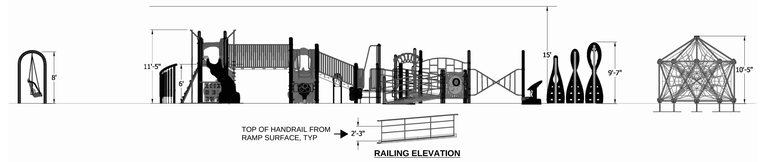
PROJECT
WILLIAM COLLIER ES - PRIMARY
WILDOMAR, CA

DESIGNED BY:
JONATHAN BOURBONNAIS
AUGUST 27, 2026
DRAWING # C26255R6
PROJECT # 26010250

DESIGNED FOR
AGES 5-12

since 1979 dave bang associates inc. park+playground outfitters

DAVE BANG PRIMARY PLAYGROUND EQUIPMENT PLAN — SCALE: N.T.S — 8



RAILING ELEVATION

NOTE: HANDRAIL GRIPPING SURFACES WITH CIRCULAR CROSS SECTION SHALL HAVE AN OUTSIDE DIAMETER OF 0.95 INCH MINIMUM AND 1.55 INCHES MAXIMUM. WHERE THE SHAPE OF THE GRIPPING SURFACE IS NON CIRCULAR, THE HANDRAIL SHALL PROVIDE AN EQUIVALENT GRIPPING SURFACE

PLAY STRUCTURE AND LAYOUT OF THE COMPONENTS CONFORM TO ASTM F1487-25 AND CPSC #325 GUIDELINES AND CCR TITLE 22, DIVISION 4 CHAPTER 22.
CRITICAL FALL HEIGHT OF OVERALL PLAY AREA: 96"

PROJECT
WILLIAM COLLIER ES - PRIMARY
WILDOMAR, CA

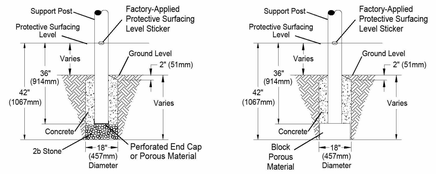
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DAVE BANG PRIMARY PLAYGROUND EQUIPMENT ELEVATION — SCALE: N.T.S — 5

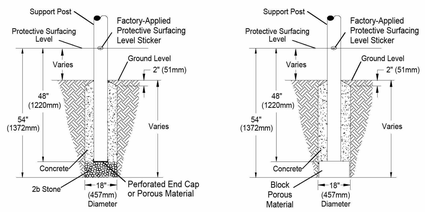
DETAIL 1
Support Post, Spiral Slide and Post Footing Detail



STONE OPTION OR BLOCK OPTION

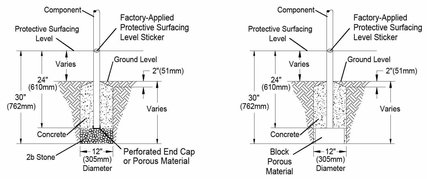
When utilizing Post Extensions adjust depth of footing/concrete accordingly.

DETAIL 2
GroundZerO, Cantilever and "T" Post Footing Detail



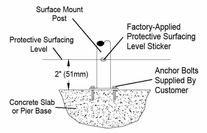
STONE OPTION OR BLOCK OPTION

DETAIL 3
Component Footing Detail

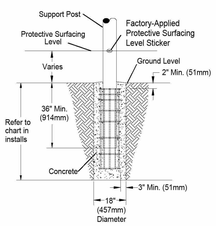


STONE OPTION OR BLOCK OPTION

DETAIL 4
Surface Mount Detail



DETAIL 5
Shade Post Footing Detail



SITE NOTES:
1) The site plan provided must be checked against the actual site area to ensure that placement of your structure meets required clearances.
2) The dimensions labeled are for location of footing holes, not exact placement of equipment. Assemble, plumb, and level equipment before pouring concrete.
3) There must be a minimum distance of 6' (1830mm) between any obstacle, sidewalk, etc., and your structure.
4) Slides must have a use zone that extends out from the lower exit section of the slide a distance that is at least 6' (1830mm) or equal to the vertical distance from the highest point of the sliding surface to the top of the protective surfacing, whichever is greater. The slide use zone should not extend greater than 8' (2438mm) from the end of the lower exit section.
5) The complete area, including the space under and around the equipment, must be covered with an impact attenuating material. See the 1997 publication, "Handbook for Public Playground Safety", published by the U.S. Consumer Product Safety Commission, for guidelines and recommendations on the type and depth of surfacing material. For a copy of the "Handbook for Public Playground Safety", write to: U.S. Consumer Product Safety Commission, Office of Information and Public Affairs, Washington, D.C. 20207

INSTALLATION NOTES:
1) Paved surfaces, such as asphalt and concrete, are not acceptable for use under your structure.
2) It is the consumer's responsibility to check with local utilities prior to excavating footings for any underground utility lines that may exist within the installation area.
3) It is the consumer's responsibility to check local soil conditions and drainage within the site area. Inquire with local contractors for appropriate recommendations.
4) If the structure is to be installed across uneven terrain, maintain the support post mark for protective surfacing level at the lowest grade. Adjust other footings accordingly.
5) The base of footings must be below frost lines.
6) Do not encase the bottom of support posts in concrete. Place all posts directly on packed stone.
7) Assemble the entire structure before pouring concrete unless specifically instructed to do so in the individual component installation instructions.
8) Read completely the installation instructions provided with your structure prior to beginning construction.

*PLAYGROUND SUPERVISION REQUIRED

PLAYWORLD

PLAYWORLD SYSTEMS, INC.
1000 Buffalo Road
Lewisburg, PA
17837-9795 USA

FOOTING LEGEND

COMPONENT FOOTING (DETAIL 3)

SPIRAL SLIDE CENTER POST FOOTING (DETAIL1)

SUPPORT POST FOOTING (DETAIL 1 or 4)
(138" INDICATES POST LENGTH)
THICK BORDER INDICATES POST EXTENSION LOCATION

CANTILEVER, "T" POST, AND COMPONENT POST FOOTING (DETAIL 2)
(ZZCH1850 INDICATES PART NUMBER)

GROUND ZERO POST FOOTING (DETAIL 2)
(148" INDICATES POST LENGTH)

SHADE HAT POST FOOTING (DETAIL 5)
(210" INDICATES POST LENGTH)

POST FOOTING DETAILS
PLAYMAKERS / CHALLENGERS

FOOTING DETAIL	SCALE: NOT TO SCALE
DRAWN BY: PW CAD	Paper Size B
DATE: 18-NOV-20	

PLAYWORLD PRIMARY PLAYGROUND EQUIPMENT FOOTING DETAILS — SCALE: N.T.S — 18

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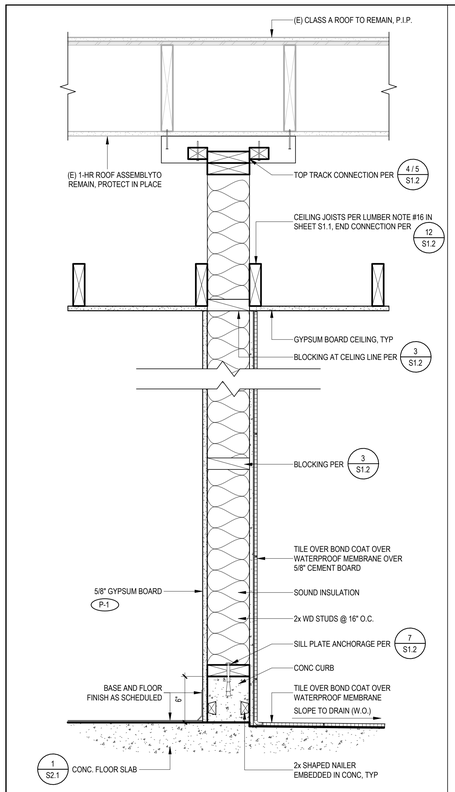
drawing title:

PLAYGROUND DETAILS

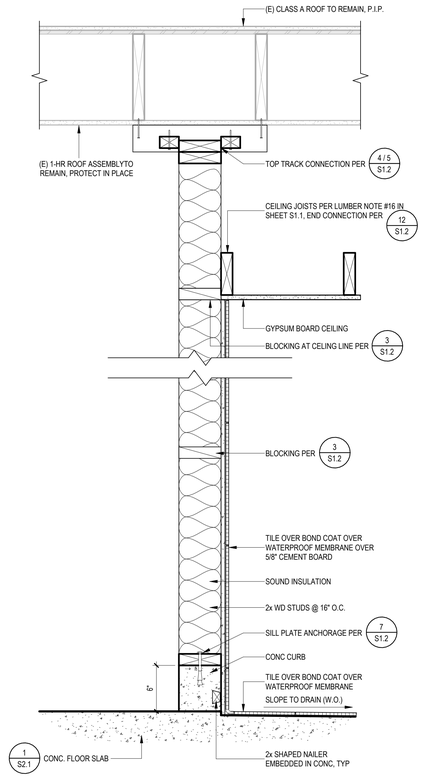
drawing no.:

2.02

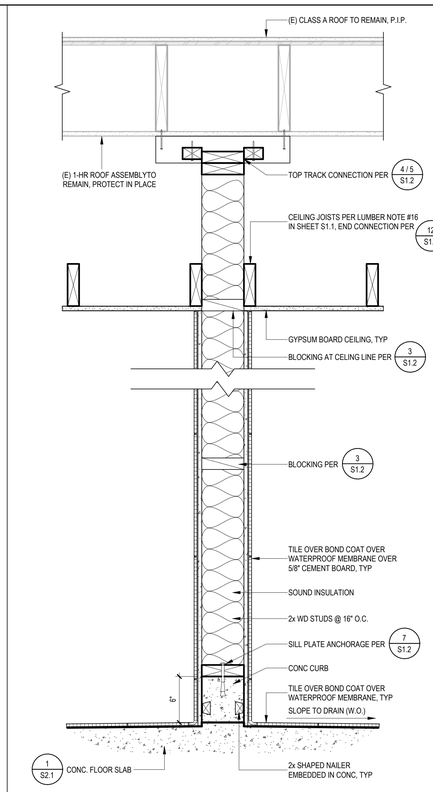
S:\24006.00 LESD William Collier ES Shade Structure Addition\Drawing\00 CURRENT Revit\Use Models\William Collier ES Site Improv_Central_EE.rvt



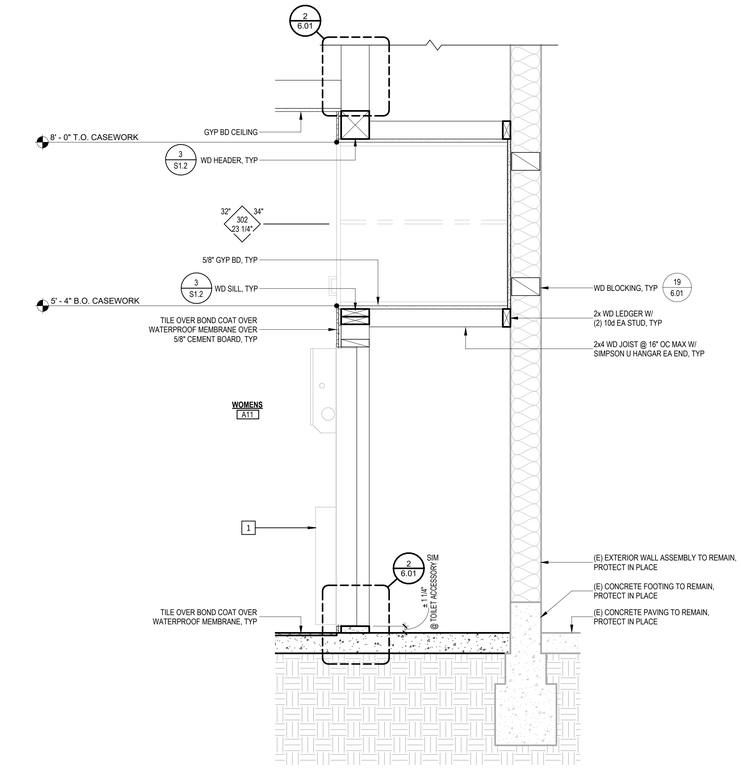
RESTROOM WALL - TILE ONE SIDE SCALE: 1 1/2" = 1'-0" | 1



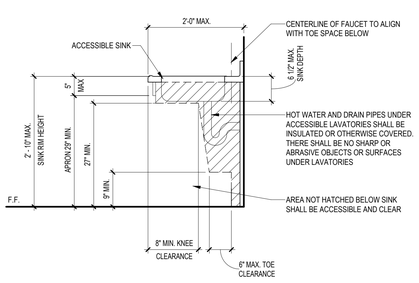
RESTROOM CHASE WALL - TILE ONE SIDE SCALE: 1 1/2" = 1'-0" | 2



RESTROOM WALL - TILE BOTH SIDES SCALE: 1 1/2" = 1'-0" | 3



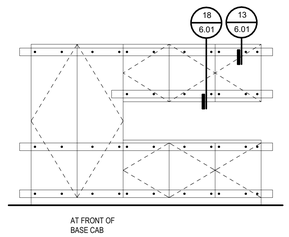
WALL SECTION 01 SCALE: 1" = 1'-0" | 5



NOTES

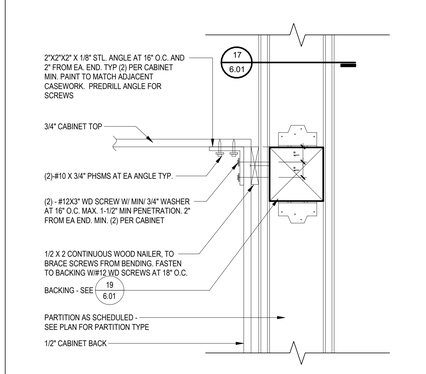
1. FAUCET CONTROLS AND OPERATING MECHANISMS SHALL BE OPERABLE WITH ONE HAND AND SHALL NOT REQUIRE TIGHT GRASPING, PINCHING, OR TWISTING OF THE WRIST. THE FORCE REQUIRED TO ACTIVATE CONTROLS SHALL BE NO MORE THAN 5 LBS.
2. LEVER OPERATED, PUSH TYPE, AND ELECTRONICALLY CONTROLLED MECHANISMS ARE ACCEPTABLE.
3. SELF-CLOSING VALVES ARE ALLOWED IF THE FAUCET REMAINS OPEN FOR AT LEAST 10 SECONDS.

ACCESSIBLE SINK SECTION SCALE: 3/4" = 1'-0" | 11

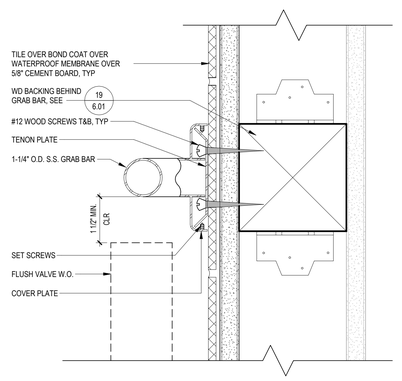


NOTES:
1. SEE INTERIOR ELEVATIONS AND FLOOR PLANS FOR CABINET CONFIGURATION AND DIMENSIONS.
2. STUDS OF WALLS BACKING CABINETS SHALL RUN FROM SLAB TO STRUCTURE ABOVE.
3. CABINETS SHALL BE FASTENERED TOGETHER WITH #QX2 COMBO-RWH 1-1/4"SCREWS. SCREW LOCATIONS ARE AT THE FRONT OF CABINET ENDS.
4. ANCHORS AT WOOD STUDS: MIN. #12 WD SCREWS AT 16" O.C. SPACING, MINIMUM OF ONE SCREW AT EACH TOP AND BOTTOM CORNER OF EACH CABINET UNIT.
5. FOR WALL HUNG BACKING AT WOOD STUDS DETAIL 19/-.

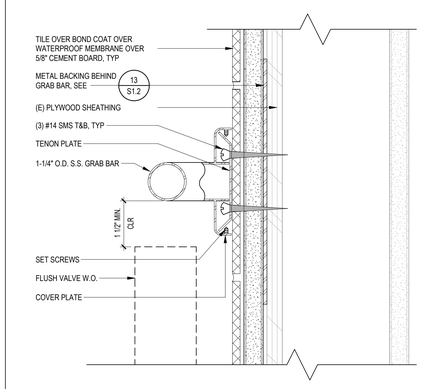
CABINET BACKING ANCHORAGE SCALE: 3/8" = 1'-0" | 12



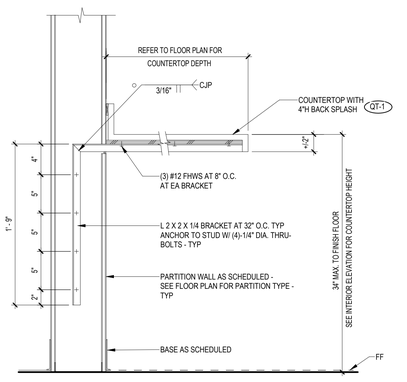
WALL ATTACHMENT TOP OF UPPER CABINET SCALE: 3" = 1'-0" | 13



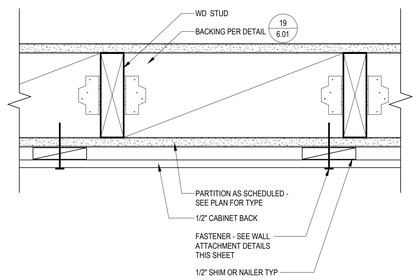
GRAB BAR ANCHORAGE SCALE: 6" = 1'-0" | 14



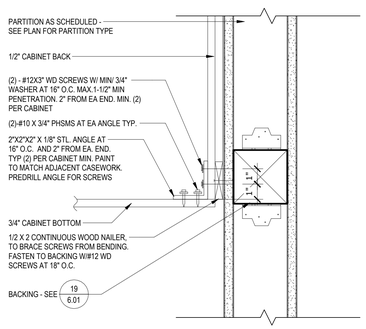
GRAB BAR ANCHORAGE AT (E) SHEAR WALL SCALE: 6" = 1'-0" | 15



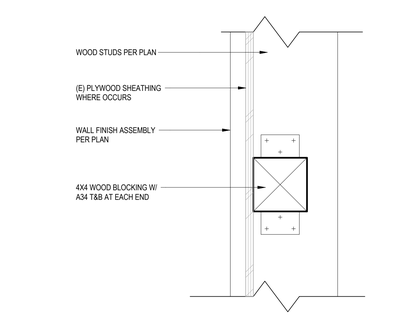
WORKSTATION / COUNTERTOP SECTION SCALE: 1 1/2" = 1'-0" | 16



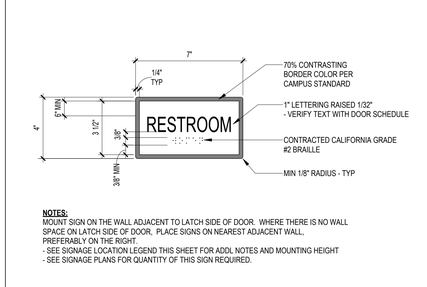
WALL ATTACHMENT - PLAN SCALE: 3" = 1'-0" | 17



WALL ATTACHMENT BOT OF UPPER CABINET SCALE: 3" = 1'-0" | 18



TYPICAL BACKING SECTION SCALE: 3" = 1'-0" | 19



NOTES:
MOUNT SIGN ON THE WALL ADJACENT TO LATCH SIDE OF DOOR. WHERE THERE IS NO WALL SPACE ON LATCH SIDE OF DOOR, PLACE SIGNS ON NEAREST ADJACENT WALL, PREFERABLY ON THE RIGHT.
- SEE SIGNAGE LOCATION LEGEND THIS SHEET FOR ADDL NOTES AND MOUNTING HEIGHT
- SEE SIGNAGE PLANS FOR QUANTITY OF THIS SIGN REQUIRED.

WALL MOUNTED RESTROOM SIGN SCALE: 3" = 1'-0" | 20

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ROOM FINISH SCHEDULE

WTWT		FLOOR			BASE				WALLS			CEILINGS			
NUMBER	NAME	MATERIAL	FINISH	COLOR	MATERIAL	HEIGHT	FINISH	COLOR	MATERIAL	FINISH	COLOR	MATERIAL	FINISH	COLOR	REMARKS
A09	(E) VICE PRINCIPAL	EXISTING	EXISTING	EXISTING	RUBBER BASE	MATCH (E)	MATCH (E)	MATCH (E)	-	MATCH (E)	MATCH (E)	EXISTING	EXISTING	EXISTING	
A10	VESTIBULE	TILE	MATTE	T-5	COVE BASE TILE	MATCH (E)	MATCH (E)	MATCH (E)	GYP. BD.	MATCH (E)	P-1	GYP. BD.	TBD	P-2	
A11	WOMENS	TILE	MATTE	T-5	COVE BASE TILE	4-1/4"	GLOSSY	T-4	TILE	GLOSSY	T-1, T-2, T-3	GYP. BD.	TBD	P-2	
A12	ALL GENDER RESTROOM	TILE	MATTE	T-5	COVE BASE TILE	4-1/4"	GLOSSY	T-4	TILE	GLOSSY	T-1, T-2, T-3	GYP. BD.	TBD	P-2	

COLOR SCHEDULE

SPEC SECTION	MATERIAL	DESIGNATION	MANUF. / CATEGORY	COLOR NO.	COLOR NAME	REMARKS
06 41 00 ARCHITECTURAL CASEWORK	COMPACT LAMINATE	CL-1	WILSONART	TBD	TBD	
07 92 00 JOINT SEALANTS	FACTORY FINISH		-	-	-	TO MATCH ADJACENT MATERIAL, CONFIRM WITH ARCHITECT
09 30 00 TILE	CERAMIC WALL TILE	T-1	DALTILE	0190	ARCTIC WHITE	6"X18" SIZE
	CERAMIC WALL TILE	T-2	DALTILE	1049	OCEAN BLUE	6"X18" SIZE
	CERAMIC WALL TILE	T-3	DALTILE	0182	SUEDE GRAY	6"X18" SIZE
	COVE BASE	T-4	DALTILE	0190	ARCTIC WHITE	FLAT TOP COVE BASE
	WALL GROUT	GRT-1	CUSTOM BUILDING PRODUCTS	TBD	TBD	LOC: WHERE WALL TILE OCCURS
	FLOOR TILE	T-5	DALTILE	0182	SUEDE GRAY	HERRINGBONE PATTERN
	FLOOR GROUT	GRT-2	CUSTOM BUILDING PRODUCTS	TBD	TBD	LOC: WHERE FLOOR TILE OCCURS
09 91 13 EXTERIOR PAINTING	PAINT	PE-1	VISTA PAINT	MATCH (E)	MATCH (E)	
	PAINT	PE-2	VISTA PAINT	TBD	TBD	
	PAINT	PE-3	VISTA PAINT	TBD	TBD	
09 91 23 INTERIOR PAINTING	PAINT WALLS	P-1	VISTA PAINT	MATCH (E)	MATCH (E)	
	PAINT CEILINGS	P-2	VISTA PAINT	TBD	TBD	
	PAINT HM DOORS	P-3	VISTA PAINT	TBD	TBD	
	PAINT HM DOOR FRAMES	P-4	VISTA PAINT	TBD	TBD	
12 36 00 COUNTERTOPS	QUARTZ COUNTERTOP	QT-1	DALTILE	TBD	TBD	

DOOR SCHEDULE

DOOR NO.	WIDTH	HEIGHT	TYPE	DOOR MATERIAL	DOOR FINISH	DOOR COLOR	FRAME MATERIAL	FRAME FINISH	FRAME COLOR	DETAILS HEAD	DETAILS TRANSOM	DETAILS JAMB	DETAILS THRESHOLD	ASSEMBLY FIRE RATING	HDWR. GROUP	REMARKS	SIGNAGE TEXT	SIGNAGE DETAIL
A9	3' - 0"	7' - 0"	(E)	(E)	(E)	(E)	(E)	(E)	(E)	(E)	(E)	(E)	16/8.01	-	(E) 3		(E)	(E)
A10	3' - 0"	7' - 0"	(E)	(E)	(E)	(E)	(E)	(E)	(E)	(E)	(E)	(E)	20/8.01	-	(E) 4		RESTROOM	20/6.01
A11	3' - 0"	7' - 0"	A	HM	PSG	P-3	HM	PSG	P-4	14/8.01 SIM	-	14/8.01	15/8.01	-	1		RESTROOM WOMEN	12 & 17/8.01
A12	3' - 0"	7' - 0"	A	HM	PSG	P-3	HM	PSG	P-4	14/8.01 SIM	-	14/8.01	15/8.01	-	2		RESTROOM ALL GENDER	13 & 18/8.01

NOTES

1. DOORS SHALL BE 1-3/4" THICK UNLESS NOTED OTHERWISE.
2. THE LETTER 'P' FOLLOWING THE 'DOOR TYPE' DESIGNATION IN THE DOOR SCHEDULE INDICATES PAIR OF DOORS. BOTH LEAVES ARE THE SAME SIZE, UNLESS NOTED OTHERWISE.
3. THE LETTER 'X' FOLLOWING THE 'DOOR TYPE' LETTER IN THE DOOR SCHEDULE INDICATES A FIXED PANEL ABOVE DOOR LEAF. SCHEDULE DIMENSION INCLUDES PANEL, UNLESS NOTED OTHERWISE.
4. FIXED PANELS SHALL BE OF THE SAME MATERIAL, CONSTRUCTION AND THICKNESS AS DOOR LEAF, AND SHALL BE PROVIDED BY THE SAME MANUFACTURER, UNLESS NOTED OTHERWISE.
5. THE LETTER 'L' FOLLOWING 'DOOR TYPE' DESIGNATION IN THE DOOR SCHEDULE INDICATES DOORS WITH LOUVERS. SEE DOOR TYPE FOR SIZE OF LOUVER.
6. LOUVERS IN EXTERIOR DOORS SHALL BE VANDAL-PROOF, SECURITY TYPE.
7. EXTERIOR DOOR REQUIREMENTS:

   ALL EXTERIOR DOORS IN BUILDINGS, INCLUDING, BUT NOT LIMITED TO DOORS OF TOILETS AND STORAGE ROOMS, SHALL CONFORM WITH THE REQUIREMENTS OF THE LATEST EDITION OF THE CALIFORNIA BUILDING CODE.

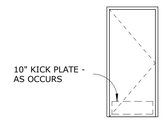
   A. EXIT DOOR SHALL BE OPERABLE FROM THE INSIDE WITHOUT THE USE OF A KEY OR ANY SPECIAL KNOWLEDGE OR EFFORT.

   B. HAND ACTIVATED DOOR OPENING HARDWARE SHALL BE CENTERED BETWEEN 34" AND 44" ABOVE FINISH FLOOR.

   C. DEAD BOLTS ARE NOT PERMITTED UNLESS OPERABLE WITH A SINGLE EFFORT LEVER TYPE HARDWARE.

   D. ALL ROOMS SERVING AN OCCUPANCY LOAD OF 50 OR GREATER AND DOORS LOCATED ON THE DISCHARGE OF EXIT CORRIDORS ARE REQUIRED TO BE PROVIDED WITH PANIC HARDWARE (CBC 1010.2.8).
8. SEE SPECIFICATION SECTION 08 71 00 FOR DOOR HARDWARE INDEX AND DOOR HARDWARE SETS.

DOOR TYPES



A

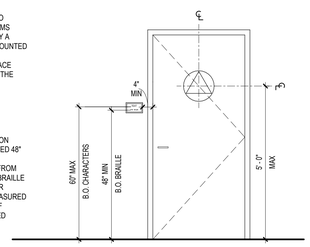
ABBREVIATIONS

AFP	ACCORDION TYPE PARTITION
ALUM	ALUMINUM
AS	ACID STAIN
ATFD	ACCORDION TYPE FIRE DOOR
DEM PART	DEMOUNTABLE PARTITION
(E)	EXISTING
EP	EPOXY PAINT
F	FACTORY FINISH
FFD	FOLDING FABRIC DOOR
FFP	FOLDING PANEL PARTITION
FFWD	FOLDING PANEL WOOD DOOR
GL	GLASS
HCN	HOLLOW CORE NATURAL FINISH
HCP	HOLLOW CORE PAINT FINISH
HM	HOLLOW METAL
LAQ	LACQUER FINISH
M	MATTE
MCN	MINERAL CORE NATURAL FINISH
MCP	MINERAL CORE PAINT FINISH
PE	PAINT EGGSHELL
PF	PAINT FLAT
PG	PAINT GLOSS
PSG	PAINT SEMI-GLOSS
S	SEAL
SCN	SOLID CORE NATURAL FINISH
SCP	SOLID CORE PAINT FINISH
SCPL	SOLID CORE PLASTIC LAMINATE
STN	STAIN FINISH
SST	STAINLESS STEEL
STL	STL
UG	UNGLAZED
VF	VARNISH FINISH
W	WAX

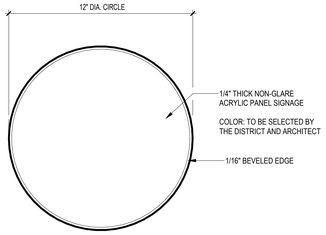
CBC 11B-703.4.2
SIGNS CONTAINING TACTILE CHARACTERS SHALL BE LOCATED SO THAT A CLEAR FLOOR SPACE OF 18 INCHES MINIMUM BY 18 INCHES MINIMUM, CENTERED ON THE TACTILE CHARACTERS, IS PROVIDED BEYOND THE ARC OF ANY DOOR SWING BETWEEN THE CLOSED POSITION AND 45-DEGREE OPEN POSITION.

CBC 11B-703.7.2.6
DOORWAYS LEADING TO TOILET & BATHING ROOMS SHALL BE IDENTIFIED BY A GEOMETRIC SYMBOL MOUNTED AT 58" MIN & 60" MAX AFF OR GROUND SURFACE FROM CENTER LINE OF THE SYMBOL

CBC 11B-703.4.1
TACTILE CHARACTERS ON SIGNS SHALL BE LOCATED 48" MIN. AFF OR GROUND SURFACE, MEASURED FROM BASELINE OF LOWEST BRAILLE CELLS & 60" MAX AFF OR GROUND SURFACE, MEASURED FROM THE BASELINE OF HIGHEST LINE OF RAISED CHARACTERS

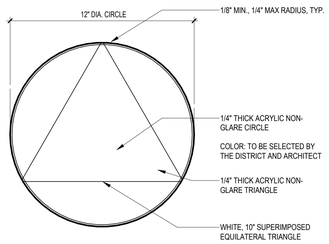


SIGNAGE LOCATION LEGEND — SCALE: 1/2" = 1'-0" — 11



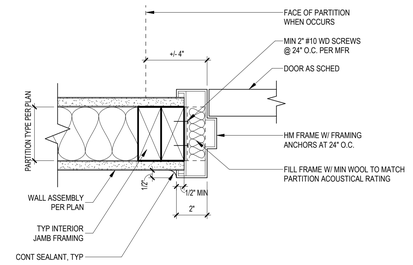
NOTES:
1. SIGNAGE COMPLIES WITH MOUNTING HEIGHT AS SHOWN ON 11/-.
2. COLOR CONTRASTS WITH DOOR IT IS MOUNTED ON.

DOOR MOUNTED RESTROOM SIGN - WOMEN — SCALE: 3" = 1'-0" — 12



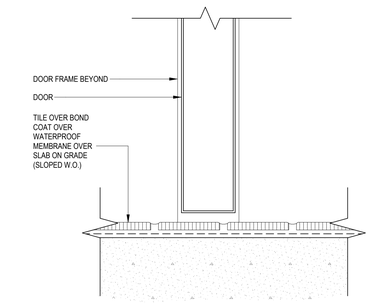
NOTES:
1. SIGNAGE COMPLIES WITH MOUNTING HEIGHT AS SHOWN ON 11/-.
2. COLOR CONTRASTS WITH DOOR IT IS MOUNTED ON.

DOOR MOUNTED RESTROOM SIGN - UNISEX — SCALE: 3" = 1'-0" — 13

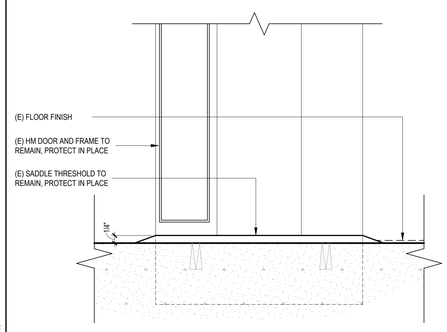


NOTES:
1. PROVIDE DOOR FRAME ANCHORS AT ALL DOORS AT 24" O.C. MAX.
2. PROVIDE FLOOR ANCHOR AT JAMB - TYP

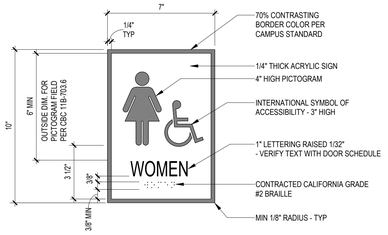
DR JAMB HM AT GYP INTERIOR — SCALE: 3" = 1'-0" — 14



THRESHOLD AT TILE FLOOR — SCALE: 6" = 1'-0" — 15

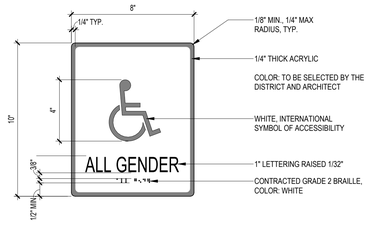


(E) THRESHOLD AT EXTERIOR DOOR — SCALE: 6" = 1'-0" — 16



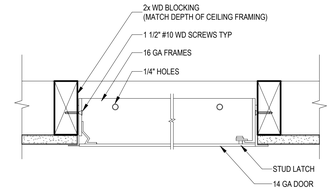
NOTES:
MOUNT SIGN ON THE WALL ADJACENT TO LATCH SIDE OF DOOR. WHERE THERE IS NO WALL SPACE ON LATCH SIDE OF DOOR, PLACE SIGNS ON NEAREST ADJACENT WALL, PREFERABLY ON THE RIGHT.
- SEE SIGNAGE LOCATION LEGEND THIS SHEET FOR ADDL NOTES AND MOUNTING HEIGHT
- SEE SIGNAGE PLANS FOR QUANTITY OF THIS SIGN REQUIRED.

WALL MOUNTED RESTROOM SIGN - WOMEN — SCALE: 3" = 1'-0" — 17



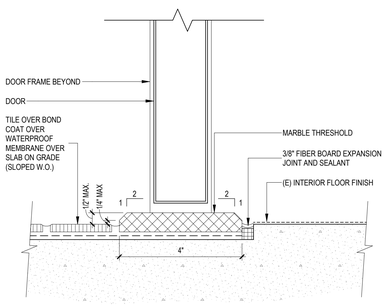
NOTES:
MOUNT SIGN ON THE WALL ADJACENT TO LATCH SIDE OF DOOR. WHERE THERE IS NO WALL SPACE ON LATCH SIDE OF DOOR, PLACE SIGNS ON NEAREST ADJACENT WALL, PREFERABLY ON THE RIGHT.
- SEE SIGNAGE LOCATION LEGEND THIS SHEET FOR ADDL NOTES AND MOUNTING HEIGHT
- SEE SIGNAGE PLANS FOR QUANTITY OF THIS SIGN REQUIRED.

WALL MOUNTED RESTROOM SIGN - UNISEX — SCALE: 3" = 1'-0" — 18



NON-RATED

ACCESS DOOR IN CEILING - TYP — SCALE: 3" = 1'-0" — 19



THRESHOLD AT (E) DOOR — SCALE: 6" = 1'-0" — 20

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 04-125584 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 09/01/2026

DIVISION OF THE STATE ARCHITECT
109 VIA FRONTERA, SUITE 300
SAN DIEGO, CA 92127
ph: 858.674.5400 fx: 858.674.5471

DSA Application Number: 04-125584
DSA File Number: 33-15

agency

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WILLIAM COLLIER ELEM SCHOOL SHADE STRUCTURE ADDITION & PLAYGROUND IMPROVEMENTS

LAKE ELSINORE UNIFIED SCHOOL DISTRICT
20150 MAYHALL DR.
WILDOMAR, CA. 92595

owner

tBP project number: 24006.00
file name:
drawn by: B.C. checked by: K.W.
date: 8/20/2026 4:23:35 PM

rev:	date:	description:
	07/02/26	DSA SUBMITTAL

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8.01

S:\24006.00 LESD William Collier ES Shade Structure Addition\Drawings\00 CURRENT Revit\User Models\William Collier ES Site Imprgv- Central_EE.rvt

GENERAL

1. SITE DEMOLITION AND RESTROOM IMPROVEMENTS ONLY SHALL COMPLY WITH THE 2025 CALIFORNIA BUILDING CODE AND ALL APPLICABLE ORDINANCES.
2. FRAMING CONDITIONS NOT SPECIFICALLY SHOWN OR INDICATED SHALL BE FRAMED SIMILAR TO DETAILS SHOWN FOR THE RESPECTIVE MATERIALS OR CONDITIONS.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL DIMENSIONS BEFORE STARTING WORK AND REPORT ANY DISCREPANCIES TO THE ARCHITECT.
4. WITHOUT EXCLUSION OF ANY REFERENCE IN THE CONSTRUCTION DOCUMENT TO ANY RULE OR REGULATION, THE STRUCTURAL ENGINEER IS NOT ASSUMING ANY PROVISIONS OF SUPERVISION OF CONSTRUCTION METHODS OR PROCESSES.

DESIGN LOADS

1. ROOF LIVE LOAD (REDUCIBLE PER SECTION 1607A.13) - - - - - - - - - - - - 20 P.S.F.
2. ROOF DEAD LOAD - 18 P.S.F.
3. WIND DESIGN:
   BASIC WIND SPEED (3 SECOND GUST) - 102 M.P.H.
   WIND EXPOSURE - C
   INTERNAL PRESSURE COEFFICIENT - +0.18/-0.18
4. SEISMIC DESIGN:
   RISK CATEGORY - II
   SEISMIC IMPORTANCE FACTOR (Ie) - 1.0
   MAPPED SPECTRAL RESPONSE ACCELERATIONS:
   Ss: 1.93
   S1: 0.63
   SITE CLASS - DEFAULT
   STRUCTURAL RESPONSE COEFFICIENTS:
   Sds: 1.39
   Sd1: 1.00
   SEISMIC DESIGN CATEGORY - D
   SEISMIC FORCE RESISTING SYSTEM: - - WOOD WALLS SHEATHED W/ WOOD STRUCTURAL PANELS RATED FOR SHEAR RESISTANCE (EXISTING TO REMAIN)
   SEISMIC RESPONSE COEFFICIENT (Cs):
   Cs: 0.267
   RESPONSE MODIFICATION FACTOR (R) - 6.5 (EXISTING TO REMAIN)
   ANALYSIS PROCEDURE USED - ELF

FOUNDATIONS

1. MAXIMUMALLOWABLE SOIL BEARING PRESSURE = 1500 PSF (CBC TABLE 1806A.2)
2. ALL FILL SHALL BE COMPACTED TO A MINIMUM OF 90% IN ACCORDANCE WITH THE SPECIFICATIONS.
3. TYPE OF SOIL: SILTY SANDY CLAYS.
4. ALL FOOTINGS SHALL REST ENTIRELY INTO ENGINEERED COMPACTED FILL.

CONCRETE

1. THE MINIMUM STRENGTH OF CONCRETE AT END OF 28 DAYS SHALL BE:
   SLABS ON GRADE - 4000 P.S.I. - - - - 150 P.C.F.
   FOOTINGS AND GRADE BEAMS - - - - - - - - - - - - - - - - - - 4000 P.S.I. - - - - 150 P.C.F.
2. REINFORCING
   A. BOLTS IN CONCRETE : ASTM F1554 GR. 36 U.N.O.
   B. REINFORCING STEEL: ASTM A-615
      TYPICAL REINFORCING: GRADE 60 (#5 AND LARGER)
      GRADE 40 (#4 AND SMALLER)
      GRADE BEAM LONGITUDINAL REINFORCING STEEL SHALL BE ASTM A706, GR. 60 OR SHALL CONFORM TO ACI 318-19 SECTION 20.2.2.5 (b).
   C. REINFORCING FABRIC: ASTM A-185
   D. WELDING OF REINFORCING STEEL: AWS D1.4 LOW HYDROGEN ALL REINFORCING TO BE WELDED: ASTM A-706
   E. PROVIDE MINIMUM LAP ON ALL BARS PER TABLE A ON 13/S1.2 U.N.O.
   F. STAGGER ALL SPLICES OF ALL HORIZONTAL REINFORCING
   G. PROVIDE MILL CERTIFICATE ON ALL REINFORCING STEEL.
   H. THE FOLLOWING MINIMUM CONCRETE COVERAGE'S SHALL BE MAINTAINED UNLESS NOTED OTHERWISE:
      1. SLABS ON GRADE - CENTER OF SLAB
      2. CAST AGAINST AND EXPOSED TO EARTH - 3"
      3. FORMED, EXPOSED TO EARTH AND WEATHER:
         #6 AND LARGER - - - - - - - - - - - - - - - - - 2"
         #5 AND SMALLER - - - - - - - - - - - - - - - - 1 1/2"
      4. NOT EXPOSED TO WEATHER OR EARTH:
         WALLS, SLABS, AND JOISTS: #14 AND #18 - 1 1/2"
         #11 AND SMALLER - - - - - - - - - - - - - - - - - 3/4"
      5. THE MINIMUM CLEAR SPACING BETWEEN PARALLEL BARS IN A LAYER SHALL BE db BUT NOT LESS THAN 1 INCH.
3. CONCRETE: READY-MIXED CONCRETE ASTM C94.
4. CEMENT: PORTLAND CEMENT TYPE V LOW ALKALI: ASTM C-150 AT NORMAL WT. CONC. PORTLAND CEMENT TYPE II LOW ALKALI: ASTM C-150 AT LIGHT WT. CONC.
5. NORMAL WT. CONC. - AGGREGATES: NATURAL ROCK AND SAND: ASTM C-33 LIGHT WT. CONC. - AGGREGATES: NATURAL ROCK AND SAND: ASTM C-330
6. DOWELS, ANCHOR BOLTS, INSERTS, ETC., SHALL BE SECURELY TIED IN PLACE PRIOR TO POURING OF CONCRETE OR GROUT.
7. ANCHOR BOLTS WITH UPSET THREADS SHALL NOT BE USED.
8. NO PIPES, DUCTS, OR CONDUIT SHALL BE PLACED IN CONCRETE UNLESS SPECIFICALLY DETAILED OR NOTED.
9. CONSTRUCTION JOINT SHALL BE CLEAN, FREE OF LAITANCE, AND INTENTIONALLY ROUGHENED TO A FULL AMPLITUDE OF 1/4" PER ACI 318-19 TABLE 22.9.4.2 AND SECTION 18.12.10 (FOR CONCRETE DIAGPHRAGMS).
10. LONGITUDINAL HOLDING WIRES SHALL CONFORM TO ASTM A1064 WITH A MAX. WIRE SIZE OF #5. HOLDING WIRES SHALL BE WELDED TO STIRRUP ONLY AND REINFORCING SHALL BE ASTM A706. ISOLATED FOOTINGS HOLDING WIRES SHALL BE LOCATED NO MORE THAN SIX BAR DIAMETER FROM FREE END. SEE CBC 1903A.5 FOR ADDITIONAL REQUIREMENTS.

NAILING SCHEDULE:

1. JOISTS AND RAFTERS TO BEARINGS-TOENAIL EA SIDE - - - - - - - - - - - - - - 3-8d
2. STUDS TO SOLE PLATE OR BEARING-TOENAIL EA SIDE - - - - - - - - - - - - - - 2-8d
3. LOWER DOUBLE TOP PLATE TO STUDS - 2-16d
4. UPPER DOUBLE TOP PLATE TO LOWER PLATE - - - - - - - - - - - 2-16d @ 16" O.C.
5. TOP PLATES-ENDS AND INTERSECTIONS - 3-16d
6. BLOCKING BETWEEN STUDS- EA END FACENAIL - - - - - - - - - - - - - - - - - - 2-16d
   TOENAIL - - - - - - - - - - - - - - - - - - - 2-10d
7. BLOCKING BETWEEN JOISTS OR RAFTERS EA END FACENAIL - - - - - - - - 2-10d
   TOENAIL - - - - - - - - - - - - - - - - - - - 3-8d
8. MULTIPLE STUDS - 16d @ 12" O.C.
9. BUILT-UP BEAMS - - - - - - - - - - - - -20d @ 32" O.C. @ TOP & BOTT STAGGERED
   2-20d AT ENDS, AT EA SPLICE
10. BUILT-UP CORNER STUDS - 16d @ 12" O.C.
11. LET IN BRACING EA END - - - 1x6 - 3-8d
    1x8 - 4-8d
    AT INTERMEDIATE STUDS - - 1x6 - 2-8d
    1x6 - 3-8d
12. RIBBONS TO STUDS - - - - - - 1x RIBBON - 2-8d
    2x RIBBON - 2-16d
13. ALL NAILS APPLIED TO PRESSURE TREATED LUMBER SHALL BE GALVANIZED.
14. PRE-DRILL PILOT HOLES TO ALL MEMBERS FOR NAILS 20d LARGER.

LUMBER

1. ALL STRUCTURAL LUMBER SHALL BE DOUGLAS FIR-LARCH OF THE GRADES INDICATED UNLESS OTHERWISE NOTED:
   SILL PLATES: DOUGLAS FIR PRESSURE TREATED (NO. 2)
   2" & 3" T&G DECKING: SELECT DEX
   STRUCTURAL FRAMING:
   2"-4" THICK 2"-4" DEEP NO.2
   2"-4" THICK 5" AND DEEPER NO.1
   BEAMS 5" & THICKER: SELECT STRUCT.
   POSTS AND TIMBERS:
   5" x 5" & LARGER SELECT STRUCT.
2. ALL STRUCTURAL LUMBER SHALL BE GRADED IN ACCORDANCE WITH THE STANDARDS OF THE WEST COAST LUMBER INSPECTION BUREAU.
3. ALL WOOD BEARING ON MASONRY OR CONCRETE SHALL BE PRESSURE TREATED DOUGLAS FIR AS OUTLINED IN C.B.C. SECTION 2303.1.9 AND A.W.P.A. U1 AND T1.
4. PLYWOOD ROOF AND SHEAR WALL SHEATHING SHALL BE GRADE MARKED STRUCTURAL I OR II (PER PLANS) PS 1-95, WITH EXTERIOR GLUE.
5. BOLTS SHALL BE ASTM A-307. PROVIDE STANDARD CUT WASHER BETWEEN BOLT HEADS AND NUTS AND THE WOOD. WHERE BOLTS ARE IN TENSION PROVIDE MALLEABLE IRON WASHERS.
6. STRUCTURAL LUMBER MEMBERS SHALL NOT BE CUT OR NOTCHED FOR PIPES OR CONDUITS ETC. UNLESS SPECIFICALLY DETAILED OR NOTED.
7. PROVIDE APPROVED METAL CROSS BRIDGING AT 8'-0" ON CENTER FOR JOISTS AND RAFTERS GREATER THAN 6" IN DEPTH.
8. 2" SOLID BLOCKING SHALL BE PROVIDED BETWEEN JOISTS AND RAFTERS AT ALL BEARING SUPPORTS.
9. NOTCH, AS REQUIRED, ALL JOISTS AND RAFTERS TO PROVIDE LEVEL, FULL BEARING AT JOISTS HANGERS, PLATES AND SUPPORTS.
10. BORE HOLES FOR BOLTS 1/16" LARGER THAN THE NOMINAL BOLT DIAMETER.
11. BORED HOLES EXCEEDING ONE THIRD OF THE WIDTH OF THE MEMBER BEING PENETRATED SHALL NOT BE PLACED IN STUDS UNLESS FULLY DETAILED ON THE APPROVED PLANS. HOLES NOT EXCEEDING ONE THIRD OF THE WIDTH SHALL BE NEATLY BORED AND SHALL BE LOCATED IN THE CENTER OF THE MEMBER BEING PENETRATED.
12. RETIGHTEN ALL BOLTS PRIOR TO COVERING, AND MAKING THE BOLTED CONNECTION INACCESSIBLE.
13. ALL NAILS ARE TO BE COMMON NAILS AND ARE TO BE GALVANIZED WHEN EXPOSED.
14. LINTEL SCHEDULE (UNLESS NOTED OTHERWISE ON PLAN)

	LINTEL SIZE AT BEARING WALL	LINTEL SIZE AT NON BEARING WALL
(OPENING WIDTH)	(SOLID MEMBER)	(BUILT UP MEMBER)
3'-0" or less	stud width x 4"	2-2X4
3'-0" to 6'-0"	stud width x 6"	2-2X6
6'-1" to 8'-0"	stud width x 8"	2-2X8

15. SCHEDULE OF ALLOWABLE CEILING JOIST SPANS:

	MAX SPAN	MAX SPAN
(JOIST)	(GYP. BOARD FINISH)	(PLASTER FINISH)
2x4 @ 16" O.C.	10'-0"	8'-0"
2x6 @ 16" O.C.	14'-0"	12'-0"
2x8 @ 16" O.C.	16'-0"	14'-0"

CEILING JOIST NOTE:
CONTRACTOR SHALL COORDINATE ALL GYPBD AND PLASTER CEILINGS WITH THE ARCHITECTURAL DWGS. CONTRACTOR SHALL PROVIDE CEILING JOISTS AS INDICATED IN CEILING JOIST SCHEDULE ABOVE, WHERE PLASTER OR GYPBD. CEILINGS EXCEED THE SPANS OF THIS TABLE, REFER TO THE SUSPENDED CEILING SYSTEMS SHOWN IN ARCHITECTURAL DWGS. CONTRACTOR SHALL COORDINATE ALL OPENINGS IN CEILING FRAMING FOR MECHANICAL REGISTERS, AND RECESSED LIGHTING, ETC.

16. ALL NAILS IN PRESSURE TREATED LUMBER SHALL BE HOT DIPPED GALVANIZED.

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WILLIAM COLLIER ELEM SCHOOL SHADE STRUCTURE ADDITION & PLAYGROUND IMPROVEMENTS

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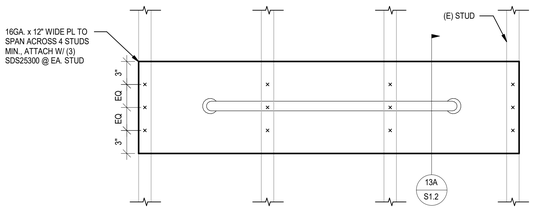
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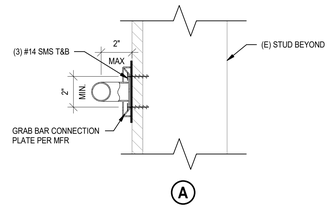
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GENERAL NOTES

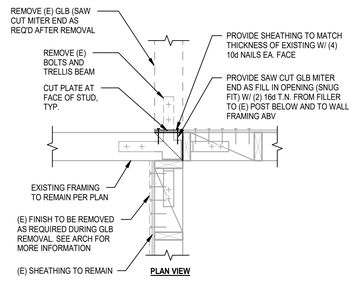
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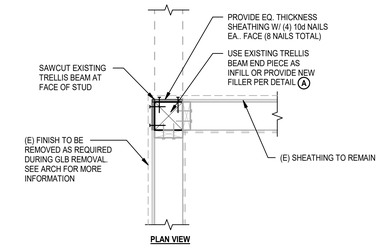




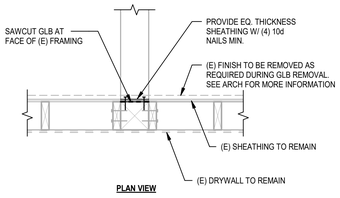
13 GRAB BAR TO WALL ATTACHMENT
NTS



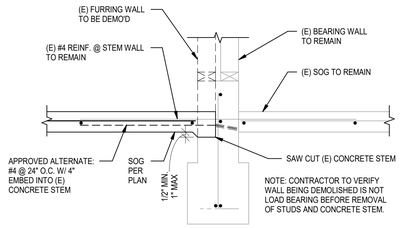
A INTERSECTING BMS @ CORNER



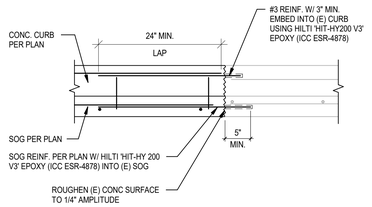
B SINGLE BM @ CORNER



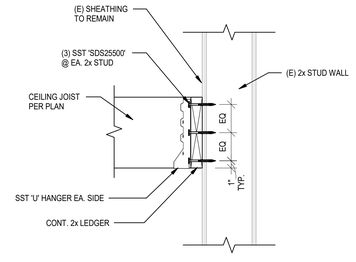
C BEAM @ CONT. WALL



14 SAWCUT CURB
1" = 1'-0"



10 BEAM REMOVAL AT EXISTING WALL AND COLUMN
1" = 1'-0"



11 CURB TO (E) CURB
1" = 1'-0"

12 CEILING FRAMING END CONNECTION
1 1/2" = 1'-0"

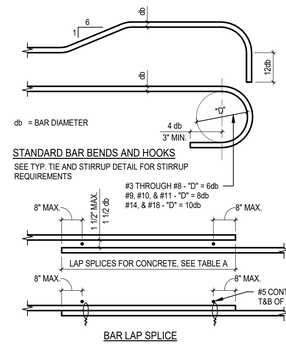
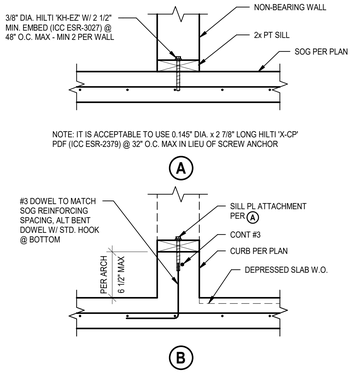


TABLE A					
	BAR LAP SPLICES IN CONC. (CLASS B) 3500 P.S.I.			BAR LAP SPLICES IN CONC. (CLASS B) 4000 P.S.I.	
	BAR SIZE	BAR LAP		BAR SIZE	BAR LAP
52 db	#4	27"	45 db	#4	25"
	#5	33"		#5	31"
	#6	40"		#6	37"
69 db	#7	58"	617 db	#7	54"
	#8	66"		#8	62"
	#9	75"		#9	70"
	#10	84"		#10	78"

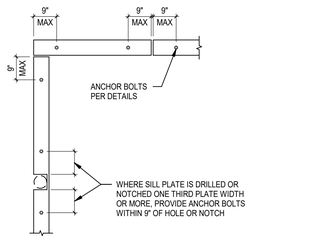
NOTES - TABLE A:
1. ALL TABULATED BAR LAPS SHALL BE MULTIPLIED BY 1.3 FOR LIGHT WEIGHT CONCRETE.
2. ALL TABULATED BAR LAPS SHALL BE MULTIPLIED BY 1.3 FOR HORIZONTAL WALL BARS, FOOTING AND GRADE BEAM TOP BARS.
3. CLEAR SPACING OF BARS BEING DEVELOPED OR SPLICED NOT LESS THAN db, CLEAR COVER NOT LESS THAN db, AND STIRRUPS OR TIES THROUGHOUT 1d NOT LESS THAN THE MINIMUM OR CLEAR SPACING OF BARS BEING DEVELOPED OR SPLICED NOT LESS THAN 2db AND CLEAR COVER NOT LESS THAN db.

NOTES - TABLE B:
1. STAGGER VERTICAL SPLICE LOCATIONS FOR #8 REINFORCING.

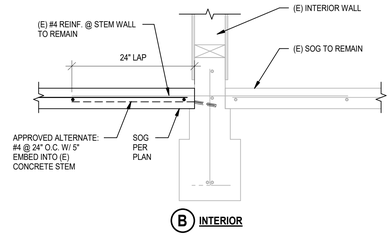
6 TYP - REINFORCING BAR DETAILS
1" = 1'-0"



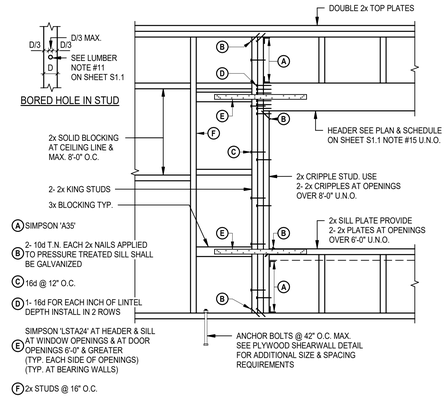
7 NON-BEARING WALL BASE CONNECTION
1 1/2" = 1'-0"



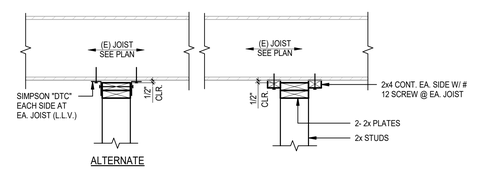
8 TYP - ANCHOR BOLT PLACEMENT AT SILL DETAIL
1/2" = 1'-0"



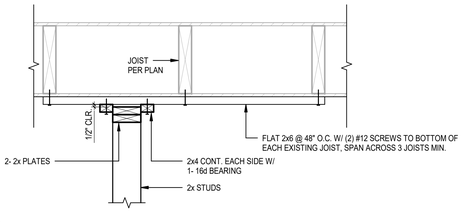
9 SOG @ (E) FOOTING
1" = 1'-0"



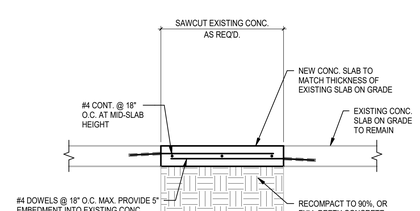
3 TYP - STUD WALL FRAMING DETAIL
3/4" = 1'-0"



4 TYP - NON BEARING WALL AT PERP. JOIST
1" = 1'-0"



5 TYP - NON BEARING WALL PARALLEL TO JOIST
1" = 1'-0"



2 TYPICAL SLAB REPAIR DETAIL
1" = 1'-0"

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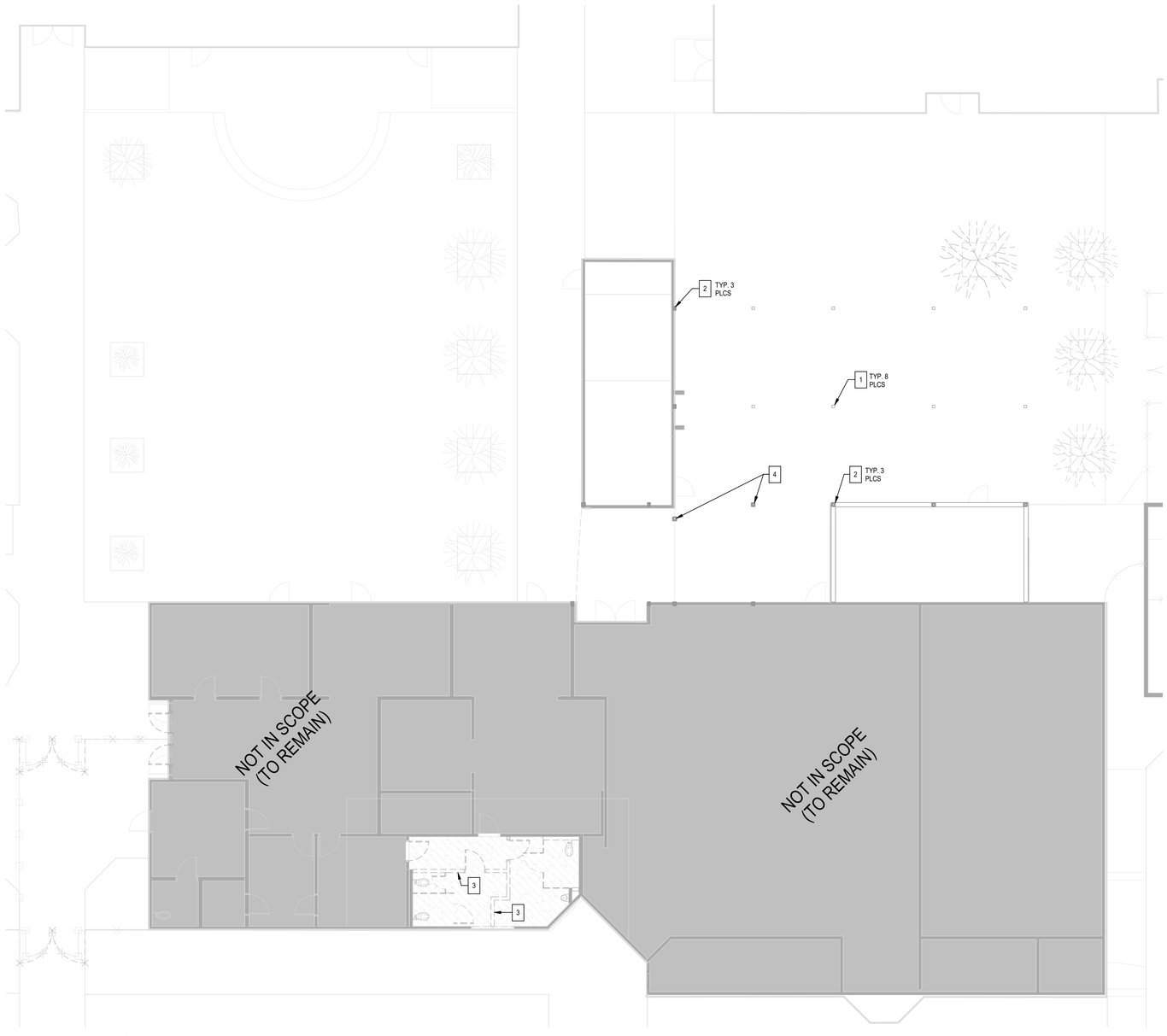
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1 FOUNDATION DEMOLITION PLAN

1/8" = 1'-0"

EXISTING FRAMING NOTES

A. THE REMOVAL, CUTTING, DRILLING, ETC. OF EXISTING WORK SHALL BE PERFORMED WITH GREAT CARE AND SMALL TOOLS IN ORDER NOT TO JEOPARDIZE THE STRUCTURAL INTEGRITY OF THE BUILDING. IF STRUCTURAL MEMBERS OR MECHANICAL, ELECTRICAL, OR ARCHITECTURAL FEATURES NOT INDICATED FOR REMOVAL INTERFERE WITH THE NEW WORK, THE ARCHITECT AND ENGINEER SHALL BE IMMEDIATELY NOTIFIED AND PRIOR APPROVAL SHALL BE OBTAINED BEFORE REMOVAL OF MEMBERS. THE CONTRACTOR SHALL SAFELY SHORE EXISTING CONSTRUCTION WHEREVER EXISTING SUPPORTS ARE REMOVED THROUGH THE INSTALLATION OF THE NEW WORK. ALL SHORING METHODS AND SEQUENCING OF DEMOLITION SHALL BE SPECIFIED BY A LICENSED CIVIL ENGINEER, TO BE RETAINED BY THE CONTRACTOR.

B. EXISTING CONSTRUCTION SHOWN ON THESE DRAWINGS WAS OBTAINED FROM AS-BUILT STRUCTURAL DRAWINGS BY NEPTUNE DAVIS THOMAS (DATED MARCH, 1993). THE CONTRACTOR SHALL VERIFY ALL EXISTING JOB CONDITIONS, REVIEW ALL DRAWINGS, AND VERIFY DIMENSIONS PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT AND EOR OF ALL DISCREPANCIES AND EXCEPTIONS BEFORE PROCEEDING WITH THE WORK.

C. THE CONTRACTOR SHALL VERIFY THE LOCATIONS OF EXISTING UTILITIES BEFORE BEGINNING WORK. SPECIAL CARE SHALL BE TAKEN TO PROTECT UTILITIES THAT ARE TO REMAIN IN SERVICE DURING CONSTRUCTION.

D. DO NOT SCALE FROM STRUCTURAL PLANS AND DETAILS, FOLLOW ARCHITECTURAL DRAWINGS FOR ALL DIMENSIONS.

E. ALL CONSTRUCTION AND DEMOLITION SHALL BE IN ACCORDANCE WITH CFC CHAPTER 33, CEBC CHAPTER 15, AND THE WRITTEN SITE SAFETY PLAN (SSP) PURSUANT TO DSA BULLETIN (BU) 24-05: FIRE SAFETY DURING CONSTRUCTION AND DEMOLITION.

KEYNOTE LEGEND:

1. (E) 5x5x3/16 T.S. TO BE REMOVED. CONTRACTOR TO PATCH BACK CONCRETE AS REQUIRED AT (E) FINISH SURFACE.
2. EXISTING WALL AND POSTS WITHIN TO REMAIN, TYP. UNO.
3. EXISTING NON-BEARING/NON-STRUCTURAL WALL AND CONCRETE CURB TO BE REMOVED.
4. EXISTING TRELLIS POST TO REMAIN.

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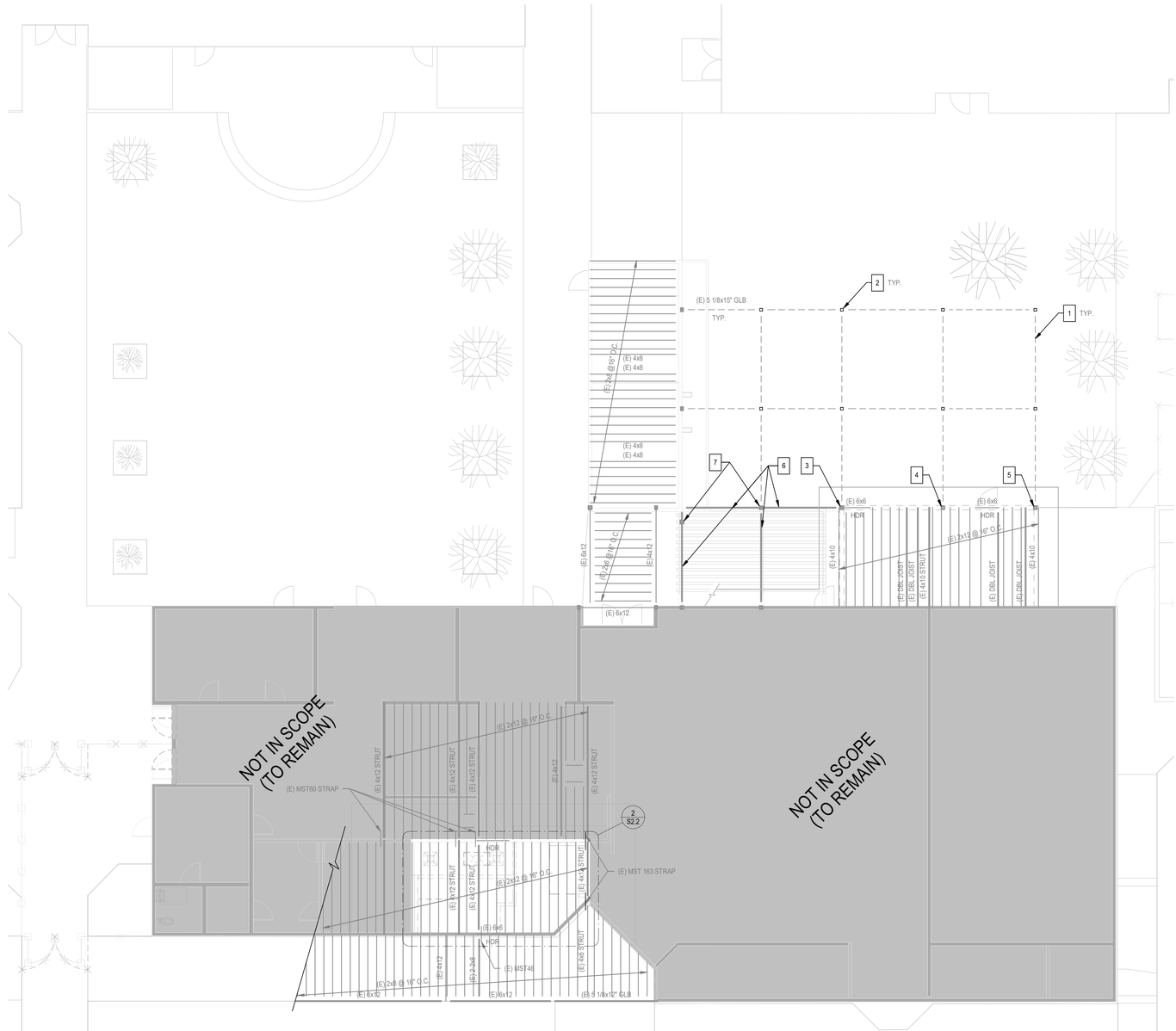
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1 FRAMING DEMOLITION PLAN
1/8" = 1'-0"

EXISTING FRAMING NOTES

A. THE REMOVAL, CUTTING, DRILLING, ETC. OF EXISTING WORK SHALL BE PERFORMED WITH GREAT CARE AND SMALL TOOLS IN ORDER NOT TO JEOPARDIZE THE STRUCTURAL INTEGRITY OF THE BUILDING. IF STRUCTURAL MEMBERS OR MECHANICAL, ELECTRICAL, OR ARCHITECTURAL FEATURES NOT INDICATED FOR REMOVAL INTERFERE WITH THE NEW WORK, THE ARCHITECT AND ENGINEER SHALL BE IMMEDIATELY NOTIFIED AND PRIOR APPROVAL SHALL BE OBTAINED BEFORE REMOVAL OF MEMBERS. THE CONTRACTOR SHALL SAFELY SHORE EXISTING CONSTRUCTION WHEREVER EXISTING SUPPORTS ARE REMOVED THROUGH THE INSTALLATION OF THE NEW WORK. ALL SHORING METHODS AND SEQUENCING OF DEMOLITION SHALL BE SPECIFIED BY A LICENSED CIVIL ENGINEER, TO BE RETAINED BY THE CONTRACTOR.

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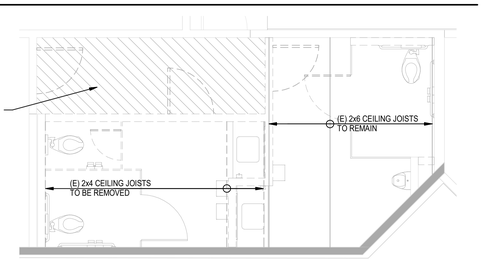
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KEYNOTE LEGEND:

1. (E) 5 1/8 x 15 GLB TO BE REMOVED
2. (E) 5x5x3/16 T.S. TO BE REMOVED. CONTRACTOR TO PATCH BACK CONCRETE AS REQUIRED AT (E) FINISH SURFACE.
3. (E) 5 1/8 x 15 GLB INTERSECTING CORNER CONNECTION TO BE SAWCUT AT BUILDING FACE PER DETAIL 10A / S1.2
4. (E) 5 1/8 x 15 GLB CONNECTION TO FACE OF (E) BLDG TO BE SAWCUT AT BUILDING FACE PER DETAIL 10C / S1.2
5. (E) 5 1/8 x 15 GLB CORNER CONNECTION TO BE SAWCUT AT BUILDING FACE PER DETAIL 10B / S1.2
6. (E) 5 1/8 x 15 GLB TO REMAIN
7. (E) 5x5x3/16 TO REMAIN



2 CEILING FRAMING DEMOLITION PLAN
1/4" = 1'-0"

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1 **FOUNDATION PLAN**
1/8" = 1'-0"

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DATE: 09/01/2026

DIVISION OF THE STATE ARCHITECT

109 VIA FRONTERA, SUITE 300
SAN DIEGO, CA 92127
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DSA Application Number: 04-125584
DSA File Number: 33-15

agency

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LANDSCAPE ARCHITECTURE
SURVEYING
PLANNING
ATHLETIC FACILITY DESIGN
GEOTECHNICAL

REGISTERED PROFESSIONAL ENGINEER
LIA DURRANT
NO. S-7114
EXP. 03/31/28
STRUCTURAL
STATE OF CALIFORNIA

consultant

WILLIAM COLLIER ELEM SCHOOL SHADE STRUCTURE ADDITION & PLAYGROUND IMPROVEMENTS

LAKE ELSINORE UNIFIED SCHOOL DISTRICT
20150 MAYHALL DR.
WILDOMAR, CA. 92595

SEI project number: 26152

tBP project number: 24006.00

file name:

drawn by: ATL checked by: ZD

date:

rev:	date:	description:
	07/02/26	DSA SUBMITTAL

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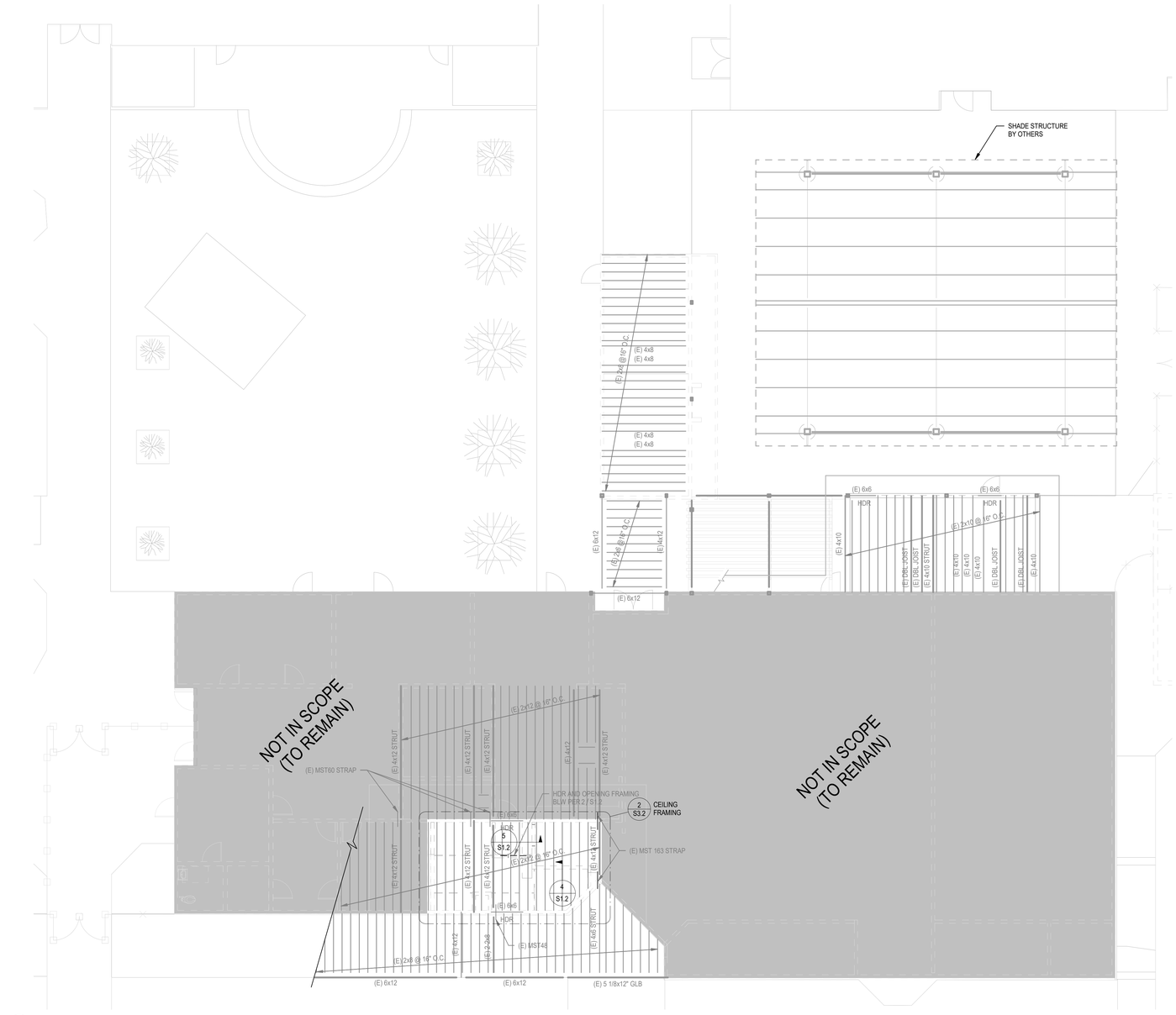
drawing title:

FOUNDATION PLAN

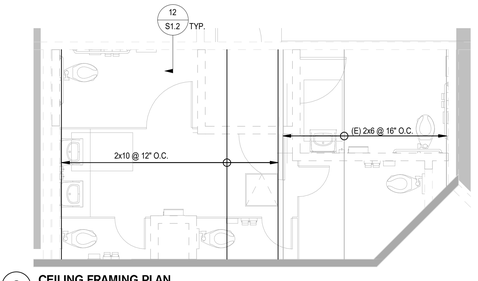
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S3.1

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1 **FRAMING PLAN**
1/8" = 1'-0"



2 **CEILING FRAMING PLAN**
1/4" = 1'-0"

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 04-125584 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 09/01/2026

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drawing title:

FRAMING PLAN

drawing no.:

S3.2

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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 2025 CBC SECTIONS 1617A.1.18 THROUGH 1617A.1.26 AND ASCE 7-22 CHAPTERS 13, 26, AND 30.

1. ALL PERMANENT EQUIPMENT AND COMPONENTS.
2. TEMPORARY OR MOVABLE 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 RETRAINED 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 REFERENCE 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 7-22 SECTION 13.3 AS DEFINED IN ASCE 7-22 SECTION 13.6.5, 13.6.6, 13.6.7, 13.6.8; AND 2025 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 SYSTEMS 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 SYSTEMS (E):

MP [X] MD [X] PP [X] E [ ] - OPTION 1: PROJECT-SPECIFIC DESIGN.

MP [ ] MD [ ] PP [ ] E [ ] - OPTION 2: DESIGN BASED ON OSHPD OPM, WITHIN PROJECT SUBMITTAL.

MP [ ] MD [ ] PP [ ] E [ ] - OPTION 3: DESIGN BASED ON OSHPD OPM, DEFERRED SUBMITTAL.

CA GREEN BUILDING STANDARDS NOTES

ENTIRE INSTALLATION SHALL COMPLY WITH THE 2025 CALIFORNIA GREEN BUILDING STANDARDS (CALGREEN) CODE INCLUDING THE FOLLOWING APPLICABLE MANDATORY MEASURES:

1. 5.504.1.3 - PERMANENT HVAC SYSTEM SHALL ONLY BE USED DURING CONSTRUCTION IF NECESSARY TO CONDITION THE BUILDING WITHIN THE REQUIRED TEMPERATURE RANGE FOR MATERIAL AND EQUIPMENT INSTALLATION. IF THE HVAC SYSTEM IS USED DURING CONSTRUCTION, CONTRACTOR SHALL USE MERV 13 MINIMUM RETURN AIR FILTERS. REPLACE ALL FILTERS IMMEDIATELY PRIOR TO OCCUPANCY.
2. 5.504.3 - CONTRACTOR SHALL COVER ALL DUCT AND OTHER RELATED AIR DISTRIBUTION COMPONENT OPENINGS WITH TAPE, PLASTIC, SHEET METAL OR OTHER METHODS ACCEPTABLE TO THE ENFORCING AGENCY DURING STORAGE AND CONSTRUCTION AND UNTIL FINAL STARTUP.
3. 5.504.5.3 - MERV 13 FILTERS ARE REQUIRED FOR HVAC SYSTEMS SERVING REGULARLY OCCUPIED AREAS AND AS INDICATED IN THESE PLANS.
4. 5.504.7 - OUTDOOR SMOKING AREAS SHALL BE MINIMUM 25'-0" FROM ALL BUILDING ENTRIES, OUTDOOR AIR INTAKES, AND OPERABLE WINDOWS.
5. 5.505.1 - INSTALLATION SHALL COMPLY WITH CBC SECTION 1203 AND CHAPTER 14 FOR INDOOR MOISTURE CONTROL.
6. 5.506.2 - DEMAND CONTROL VENTILATION REQUIRED FOR ALL DENSELY OCCUPIED SPACES PER 2025 CALIFORNIA ENERGY CODE REQUIREMENTS.
7. 5.508.1 - HVAC, REFRIGERATION, AND FIRE SUPPRESSION EQUIPMENT SHALL NOT CONTAIN CFCS OR HALONS.

LEGEND

SYMBOL	ABBR.	DESCRIPTION
	–	SUPPLY AIR RISER
	–	RETURN AIR RISER
	–	EXHAUST AIR RISER
	SAG	SUPPLY AIR GRILLE
	RAG	RETURN AIR GRILLE
	EAG	EXHAUST AIR GRILLE
	SWR	SIDEWALL REGISTER
	(L)	LINED DUCTWORK
	–	FLEXIBLE CONNECTION
	FC	FLEXIBLE CONNECTION
	–	NEW DUCT (SEE PLAN)
	–	EXISTING DUCT (SEE PLAN)
	–	DEMO DUCT (SEE PLAN)
	MVD	MANUAL VOLUME DAMPER
	BDD	BACKDRAFT DAMPER
S/FI	SFD	SMOKE / FIRE DAMPER
F	FD	FIRE DAMPER
	DL	DOOR LOUVER
U.C.	UC	UNDERCUT DOOR 3/4"
RS	RS	REFRIGERANT SUCTION LINE
RL	RL	REFRIGERANT LIQUID LINE
CD	CD	CONDENSATE DRAIN
	S.D.	SMOKE DETECTOR
	P.O.C.	POINT OF CONNECTION
T	T–STAT	THERMOSTAT MOUNTED MAX 48" A.F.F. TO TOP OF BOX (11B–308.1.1)
H	H	HUMIDISTAT
TS	TS	TEMPERATURE SENSOR
OS	OS	OVERRIDE SWITCH
PD	PD	PRESSURE DIFFERENTIAL SWITCH
S	S	SWITCH
CO_2	CO_2 SENSOR	
	O.C.	ON CENTER
	HWR	HOT–WATER RETURN
	HWS	HOT–WATER SUPPLY
	I.D.	INSIDE DIAMETER
	O.D.	OUTSIDE DIAMETER
	W/	WITH
	S/M	SHEET METAL
	S/S	STAINLESS STEEL
	G.C.	GENERAL CONTRACTOR
	VTR	VENT THRU ROOF
	EMS	ENERGY MANAGEMENT SYSTEM
	OBD	OPPOSED BLADE DAMPER
	FSC	FAN SPEED CONTROL

GENERAL NOTES

----- GENERAL NOTES -----

1. ENTIRE INSTALLATION SHALL CONFORM TO THE REQUIREMENTS OF THE 2025 CALIFORNIA MECHANICAL CODE, 2025 CALIFORNIA BUILDING CODE, AND ALL OTHER APPLICABLE CODES AND REGULATIONS, INCLUDING 2025 CALIFORNIA ENERGY CONSERVATION STANDARDS DIVISION T–24.
2. COORDINATE ENTIRE INSTALLATION OF THE HVAC SYSTEM WITH THE WORK OF ALL OTHER TRADES PRIOR TO ANY FABRICATION OR INSTALLATION. PROVIDE ALL FITTINGS, OFFSETS, AND TRANSITIONS AS REQUIRED FOR A COMPLETE WORKABLE INSTALLATION. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE ITEMS TO BE PROVIDED BY OTHER TRADES WHERE MENTIONED IN THE CONTRACT DOCUMENTS PRIOR TO BID – NO EXCEPTIONS.
3. COORDINATE THE LOCATIONS OF ALL CEILING DIFFUSERS, REGISTERS, AND GRILLES WITH THE ARCHITECTURAL REFLECTIVE CEILING PLAN, ELECTRICAL LIGHTING LAYOUT AND ARCHITECTURAL ROOM ELEVATIONS. THE ARCHITECT SHALL BE IMMEDIATELY NOTIFIED OF ANY CONFLICTS PRIOR TO FABRICATION AND INSTALLATION.
4. NOT USED.
5. ALL EQUIPMENT, DUCTS, PIPING, AND OTHER DEVICES AND MATERIALS INSTALLED OUTSIDE OF THE BUILDING OR OTHERWISE EXPOSED TO THE WEATHER SHALL BE COMPLETELY WEATHER–PROOFED AND PAINTED TO MATCH, COORDINATE WITH ARCHITECT PRIOR TO PAINTING.
6. ALL DIMENSIONS SHOWN ON THESE PLANS ARE APPROXIMATE AND MUST BE CONFIRMED ON SITE.
7. PRIOR TO OCCUPANCY, THE ENTIRE H.V.A.C. SYSTEMS SHALL BE BALANCED IN ACCORDANCE WITH (AABC) ASSOCIATED AIR BALANCE COUNCIL STANDARDS BY AN INDEPENDANT AIR BALANCE CONTRACTOR. CERTIFICATION SHALL BE PROVIDED BY THE CONTRACTOR FOR AIR AND HYDRONIC AS APPLICABLE. SYSTEMS SHALL BE BALANCED AS INDICATED ON PLANS INCLUDING FRESH AIR VENTILATION. WHERE THERE IS A CONFLICT WITH THE MECHANICAL PLANS, THE AIR BALANCE CONTRACTOR SHALL NOTIFY THE ARCHITECT PRIOR TO BALANCING OF SYSTEM. IF NOT THE AIR BALANCE CONTRACTOR SHALL BEAR ALL COSTS INCURRED FOR WORK THAT MUST BE RE–BALANCED DUE TO CONFLICTS ON CONTRACT DOCUMENTS. CONTRACTOR SHALL PROVIDE THREE COPIES OF THE AIR BALANCE REPORT TO THE ARCHITECT FOR REVIEW AND APPROVAL.
8. FOR INACCESSIBLE AREAS THE CONTRACTOR SHALL PROVIDE ACCESS PANELS FOR ALL DAMPERS, EQUIPMENT, SMOKE DETECTORS, AND CONTROL DEVICES. THESE PANELS SHALL MATCH THE RATING OF THE WALL AND/OR CEILING THAT THEY ARE LOCATED IN. MINIMUM ACCESS PANEL SIZES SHALL BE AS FOLLOWS:

   1) HAND ACCESS: 12"x12"

   2) BODY ACCESS: 30"x30" MIN. WHERE A LARGER ACCESS SIZE IS REQUIRED DUE TO INSTALLATION CONSTRAINTS, THE CONTRACTOR SHALL DO SO AT NO ADDITIONAL COST AND SHALL NOTIFY THE ARCHITECT OF DEVIATIONS PRIOR TO INSTALLATION.
9. ALL EQUIPMENT, ACCESSORIES, AND RELATED PIPING SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S RECOMMENDATIONS. PROVIDE ALL FITTINGS, TRANSITIONS, DAMPERS, VALVES, AND OTHER DEVICES REQUIRED FOR A COMPLETE WORKABLE INSTALLATION.
10. MAINTENANCE LABEL SHALL BE AFFIXED TO ALL MECHANICAL EQUIPMENT AND A MAINTENANCE MANUAL SHALL BE PROVIDED FOR THE ARCHITECT'S USE.
11. ALL EQUIPMENT WITH MOVING PARTS SHALL BE PROVIDED WITH FLEXIBLE DUCT AND PIPE CONNECTIONS.
12. ALL HVAC EQUIPMENT SHALL BE CERTIFIED BY THE CALIFORNIA ENERGY COMMISSION TO COMPLY WITH LATEST EFFICIENCY STANDARDS.
13. ALL FRESH AIR INTAKES SHALL MEET CODE REQUIRED CLEARANCES FROM EXHAUST, FLUE, FUEL BURNING APPLIANCE AND PLUMBING VENT OUTLETS. FOR GAS/ELECTRIC AIR CONDITIONING UNITS WHERE THE CODE REQUIRED CLEARANCES ARE NOT MET, A FACTORY FLUE GAS DEFLECTOR AND EXTENSION SHALL BE USED TO MINIMIZE THESE CLEARANCES. CONTRACTOR SHALL DETERMINE LOCATIONS WHERE REQUIRED PRIOR TO BID. THIS SHALL BE PROVIDED AT NO ADDITIONAL COST.
14. CONTRACTOR SHALL VERIFY ALL CLEARANCES AND AVAILIABLE SPACE FOR DUCTWORK PRIOR TO ORDERING AND/OR FABRICATING MATERIAL.
15. CONTRACTOR TO SUBMIT ALL EQUIPMENT, DUCTWORK, AIR DISTRIBUTION DEVICES, AND OTHER ACCESSORIES TO THE ENGINEER FOR APPROVAL PRIOR TO ANY ORDERING OF SUCH ITEMS.
16. CONTRACTOR SHALL PROVIDE SHOP DRAWINGS WITHIN 35 DAYS OF AWARD OF CONTRACT. IF SHOP DRAWINGS ARE NOT PROVIDED TO THE ARCHITECT FOR APPROVAL, AND ANY CONFLICTS OCCUR BETWEEN TRADES, DURING CONSTRUCTION, & ETC. THEN THE CONTRACTOR SHALL BE RESPONSIBLE AND BEAR ALL COST INCURRED FOR ANY REVISIONS AT NO ADDITIONAL COST TO THE ARCHITECT. THE ARCHITECT SHALL BE NOTIFIED IMMEDIATELY PRIOR TO FABRICATION AND INSTALLATION OF ANY CONFLICTS BETWEEN TRADES, DURING CONSTRUCTION, & ETC.
17. CONTRACTOR SHALL BE RESPONSIBLE FOR COMMISSIONING OF EQUIPMENT.
18. UNLESS SPECIFICALLY SHOWN ON THESE PLANS NO STRUCTURAL MEMBERS SHALL BE CUT, DRILLED NOR NOTCHED WITHOUT PRIOR WRITTEN AUTHORIZATION FROM THE STRUCTURAL ENGINEER AND THE DISTRICT STRUCTURAL ENGINEER FROM THE DIVISION OF THE STATE ARCHITECT.

----- CONTROLS -----

19. CONTROL SCHEMATICS ARE FOR SEQUENCE ONLY. REFER TO ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR ALL ELECTRICAL DEVICES REQUIRED.
20. ALL LINE VOLTAGE WIRING SHALL BE INSTALLED IN CONDUIT. ALL LINE VOLTAGE CONDUIT AND WIRING, INCLUDING FINAL CONNECTIONS, SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR AS INDICATED ON THE ELECTRICAL DRAWINGS OR SPECIFIED IN THE ELECTRICAL SECTION OF THE SPECIFICATIONS. ALL ELECTRICAL WORK SHALL BE INSTALLED IN ACCORDANCE WITH ALL APPLICABLE CODES AND REGULATIONS OF ALL GOVERNING BODIES HAVING JURISDICTION THEREOF.
21. ALL LOW VOLTAGE CONDUIT AND WIRING AS APPLICABLE, INCLUDING FINAL CONNECTIONS, SHALL BE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR AS INDICATED ON THE MECHANICAL DRAWINGS OR SPECIFIED IN THE MECHANICAL SECTION OF THE SPECIFICATIONS.

   A1) ALL LOW VOLTAGE WIRING SHALL BE INSTALLED IN CONDUIT IN INACCESSIBLE AREAS.

   A2) ALL LOW VOLTAGE WIRING SHALL BE PLENUM – RATED ABOVE ACCESSIBLE CEILINGS.

   B) WHERE THE CONTROLS CONTRACTOR IS RETAINED BY THE OWNER, THEY SHALL BE RESPONSIBLE FOR THE FOLLOWING:

   1) FURNISH AND INSTALL ALL DEVICES, WIRING, AND TERMINATIONS REQUIRED FOR A COMPLETE AND FUNCTIONAL INSTALLATION.

   2) COORDINATE ALL WORK AND REQUIREMENTS WITH OTHER TRADES INCLUDING GENERAL, MECHANICAL, AND ELECTRICAL CONTRACTORS.

   3) CONTRACTOR SHALL FOLLOW ALL SUBMITTAL REQUIREMENTS PER DRAWINGS AND SPECIFICATIONS.
22. ALL THERMOSTATS SHALL BE OF THE ELECTRONIC, PROGRAMMABLE, AUTOMATIC CHANGEOVER TYPE TO SEQUENCE HEATING OR COOLING. SET POINT RANGE SHALL BE 10 DEGREES F. BETWEEN FULL HEATING AND COOLING. THEY SHALL HAVE CAPABILITY OF TERMINATING ALL HEATING AT A TEMPERATURE NO MORE THAN 70 DEGREES F., AND COOLING AT A TEMPERATURE NOT LESS THAN 78 DEGREES F. ADJUSTABLE TEMPERATURE DIFFERENTIAL SHALL BE 1– 1/2 DEGREES F. CONTROL LIMITS SHALL BE FROM 55 DEGREES F. TO 85 DEGREES F. MOUNT AT 48 INCHES ABOVE FLOOR SECTION 11B–308, 2025 CBC.

   NOTES: 1) THERMOSTATS THAT ARE PART OF AN ENERGY MANAGEMENT SYSTEM SHALL FOLLOW CONTROL SPECIFICATIONS AND DRAWING REQUIREMENTS.

   2) SHOULD THE LOCATION OF THE THERMOSTAT NOT MEET THE ADA HEIGHT REQUIREMENTS DUE TO OBSTRUCTIONS, THEN AN ALTERNATE LOCATION SHALL BE PROPOSED OR REQUESTED BY THE CONTRACTOR THAT SHALL BE APPROVED BY THE ARCHITECT.
23. CONTROLS CONTRACTOR AND AIR BALANCE CONTRACTOR SHALL COORDINATE WORK AND PERFORM NECESSARY TASKS AS REQUIRED TO OBTAIN AIR AND WATER FLOW QUANTITIES FOR SYSTEMS SHOWN HEREIN.
24. CONTROLS SHALL BE PROVIDED TO PROVIDE THE MINIMUM RATE OF OUTDOOR AIR REQUIRED BY THE STATE ENERGY REGULATIONS.

----- AIR DISTRIBUTION -----

25. ALL DUCTWORK SHALL BE SHEET METAL CONSTRUCTED OR SPIRAL, ERECTED, AND TESTED IN ACCORDANCE WITH THE MOST RESTRICTIVE OF LOCAL REGULATIONS, PROCEDURES DETAILED IN THE ASHRAE HANDBOOK OF FUNDAMENTALS, CHAPTER 6 OF THE MECHANICAL CODE, OR THE APPLICABLE STANDARDS ADOPTED BY THE SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION.
26. ALL FLEXIBLE DUCTWORK SHALL NOT EXCEED FIVE FEET IN LENGTH TO RESPECTIVE DIFFUSERS, GRILLES, AND REGISTERS, OR OTHER AIR DEVICES.
27. ALL DUCT TURNS IN RECTANGULAR SUPPLY, RETURN, AND EXHAUST DUCTS SHALL HAVE TURNING VANES UNLESS OTHERWISE NOTED.
28. DUCTWORK HANDLING CONDITIONED AIR SHALL BE INSULATED OR LINED AS INDICATED ON DRAWINGS. SUPPLY AND RETURN DUCT INSULATION SHALL BE MIN. 1.5" THICK, 3/4 LB./CUBIC FT. DENSITY AND HAVE A MIN. VALUE OF R–8 WHERE LOCATED IN ONE OR MORE OF THE FOLLOWING SPACES:

   A) OUTDOORS, OR

   B) IN A SPACE BETWEEN THE ROOF AND AN INSULATED CEILING, OR

   C) IN A SPACE DIRECTLY UNDER A ROOF WITH FIXED VENTS OR OPENINGS TO THE OUTSIDE OR UNCONDITIONED SPACES, OR

   D) IN AN UNCONDITIONED CRAWLSPACE; OR

   E) IN OTHER UNCONDITIONED SPACES

   PER 2025 CEC, OTHERWISE PROVIDE R–4.2 WHEN LOCATED IN CONDITIONED ATTIC SPACES ABOVE CEILINGS . ALL DUCTWORK EXPOSED ON ROOF SHALL BE INTERNALLY LINED WITH 1.5" THICK, 1.5LB./CUBIC FT. DENSITY DUCT LINER UNLESS OTHERWISE INDICATED OR SPECIFIED. ALL DUCT SIZES ARE SHEET METAL SIZES. ALL DUCT JOINTS SHALL BE SEALED PER CHAPTER 6 MECHANICAL CODE REQUIREMENTS. PROVIDE PIPING AND DUCT INSULATION IN ACCORDANCE WITH THE LATEST STANDARDS OF THE CALIFORNIA ENERGY COMMISSION.
29. ALL INSULATION SHALL HAVE A FLAME SPREAD OF NOT MORE THAN 25 AND A SMOKE DENSITY NOT EXCEEDING 50.
30. MANUAL VOLUME DAMPERS SHALL BE PROVIDED IN ALL DUCT BRANCHES TO INDIVIDUAL DIFFUSERS, GRILLES, AND REGISTERS, AS WELL AS FRESH AIR INTAKE DUCTS. DAMPERS SHALL BE LOCATED AT THE BRANCH DUCT LOCATIONS. THE MECHANICAL CONTRACTOR SHALL COORDINATE LOCATIONS OF DAMPERS WITH THE AIR BALANCE CONTRACTOR, SO THEY ARE ACCESSIBLE PRIOR TO INSTALLATION. IN LOCATIONS WHERE THESE DAMPERS ARE INACCESSIBLE, CABLE OPERATED ADJUSTMENT CONTROLS SHALL BE PROVIDED AT NO ADDITIONAL COST. OPPOSED BLADE DAMPERS SHALL NOT BE PERMITTED UNLESS NOTED OTHERWISE.
31. AUTOMATIC FIRE DAMPER REQUIREMENTS ARE AS FOLLOWS:

   A) PROVIDE AUTOMATIC FIRE DAMPERS AT ALL PENETRATIONS OF FIRE–RATED CEILINGS AND WALLS THROUGHOUT. CONTRACTOR SHALL COORDINATE FIRE–RATED AREAS WITH THE ARCHITECTURAL DRAWINGS AND OTHER TRADES PRIOR TO INSTALL AND SHALL NOTIFY PERTINENT PARTIES PRIOR TO ANY WORK PERFORMED IN THESE AREAS. IN ADDITION, CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE PROPER ACCESS FOR DAMPERS INSTALLED. THE DAMPER FIRE RATING SHALL BE COMPATIBLE WITH THE CEILING/WALL RATING.

   B) LOCATION OF FIRE–RATED CEILINGS AND WALLS ARE AS INDICATED ON THE ARCHITECTURAL DRAWINGS.

   C) FIRE AND/OR SMOKE DAMPER(S) SHALL BE PROVIDED AS REQUIRED BY THE LATEST CALIFORNIA BUILDING CODE.

   D) CONTRACTOR SHALL FURNISH FLUSH MOUNTED FIRE AND/OR SMOKE DAMPERS, SO THAT DAMPERS DO NOT EXTEND PAST WALLS, FOR AREAS WITHOUT CEILINGS FOR QUALITY WORKMANSHIP.
32. CONTRACTOR SHALL PERFORM MAINTENANCE ON ALL EXISTING FIRE AND SMOKE/FIRE DAMPERS PER MANUFACTURER'S PROVISIONS. ANY FAILURES OR NON–OPERATING DAMPERS SHALL BE REPLACED AND SHALL CONFORM TO CURRENT CODE REGULATIONS.
33. ALL DUCTWORK PASSING THROUGH FIRE RATED CORRIDORS AND LOBBIES SHALL BE MIN. 26 GAGE SHEET METAL CONSTRUCTION.
34. ALL DUCTWORK, PIPING, CONDUIT, & ETC. PENETRATING FIRE RATED CONSTRUCTION SHALL HAVE APPROVED FIRE STOPPING.

AIR DISTRIBUTION SCHEDULE

SYM.	MANUF & MODEL	NECK SIZE	FACE SIZE	CFM RANGE	MAX. NECK VELOCITY	MAX. N.C.	T. P. DROP	TYPE	DAMPER	REMARKS
– SD–1	PRICE SMCD	6"x6" 8"x8" 10"x10" 12"x12" 14"x14" 16"x16" 18"x18" 20"x20"	12"x12" 14"x14" 16"x16" 18"x18" 20"x20" 22"x22" 24"x24" 26"x26"	0 - 125 130 - 220 225 - 350 355 - 500 505 - 680 685 - 880 885 - 1125 1130 - 1400	500	25	.057	MODULAR CORE	MVD	BORDER TYPE 1 FOR GYP. BOARD CEILING PROVIDE SQUARE TO ROUND ADAPTER FOR ALL
– TG–1	PRICE 530L	6"x6" 8"x8" 10"x10" 12"x12" 14"x14" 16"x16" 18"x18" 22"x20"	8"x8" 10"x10" 12"x12" 14"x14" 16"x16" 18"x18" 20"x20" 24"x22"	0 - 90 95 - 195 200 - 300 305 - 450 455 - 590 595 - 800 805 - 1040 1045 - 1400	500	25	.067	LOUVERED	MVD	BORDER TYPE N FOR GYP. BOARD CEILING

LEGEND

– CFM
– AIR DISTRIBUTION DEVICE

SD	SUPPLY DIFFUSER
SR	SUPPLY REGISTER
RG	RETURN GRILLE
EG	EXHAUST GRILLE
TG	TRANSFER GRILLE

NOTES:
1. NOT ALL DIFFUSER/GRILLE TYPES OR SIZES MAY BE USED ON THIS PROJECT.

EXHAUST FAN SCHEDULE

SYM	MFR & MODEL #	AREA SERVICED	FAN TYPE	CFM	ESP (IN. WG)	FAN RPM	WATTS	MOTOR RPM	MOTOR TYPE	ELECTRICAL V	ELECTRICAL PH	WEIGHT (LBS)	REMARKS	WIRING DETAIL	ANCHORAGE DETAIL
EF 1	GREENHECK SP-A390-VG	WOMENS RR	CEILING	200	0.2	911	22	-	DIRECT	115	1	25	1, 2, 3, 4	5/M3–1	2/M3–1
EF 2	GREENHECK SP-A90-130-VG	WOMENS RR	CEILING	100	0.2	960	12	-	DIRECT	115	1	15	1, 2, 3, 4	5/M3–1	2/M3–1
EF 3	GREENHECK SP-A90-130-VG	MENS RR	CEILING	100	0.2	960	12	-	DIRECT	115	1	15	1, 2, 3, 4	5/M3–1	2/M3–1

1. MANUFACTURE HANGING BRACKET. 2. BACKDRAFT DAMPER. 3. INTERLOCK W/ AC-06. 4. CONNECT TO (E) ROOF JACK.

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APP: 04-125584 INC:
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DATE: 09/01/2026

DIVISION OF THE STATE ARCHITECT

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DSA Application Number: 04-125584
DSA File Number: 33-15

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WILLIAM COLLIER ELEM SCHOOL SHADE STRUCTURE ADDITION & PLAYGROUND IMPROVEMENTS

LAKE ELSINORE UNIFIED SCHOOL DISTRICT
20150 MAYHALL DR.
WILDOMAR, CA. 92595

tBP project number: 24006.00

file name:

drawn by: E.M. checked by: E.M.

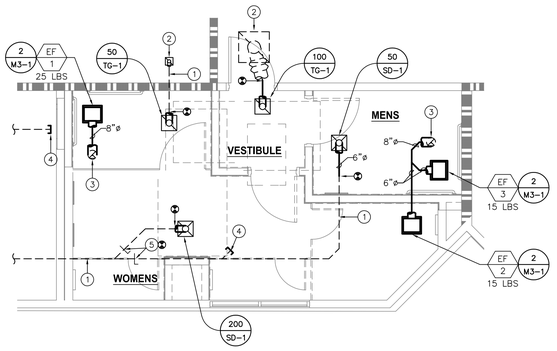
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drawing title:
MECH LEGEND,SCHEDULES AND GENERAL NOTES

drawing no.:
M0-1



CONSTRUCTION NOTES:

1. FIELD VERIFY ALL EXISTING DUCT DIMENSIONS INDICATED PRIOR TO FABRICATION. PROVIDE ALL TRANSITIONS AS REQUIRED TO CONNECT NEW DUCTWORK TO EXISTING.
2. COORDINATE ENTIRE INSTALLATION OF THE HVAC SYSTEM WITH THE WORK OF ALL OTHER TRADES PRIOR TO ANY FABRICATION OR INSTALLATION. PROVIDE ALL FITTINGS, OFFSETS, AND TRANSITIONS AS REQUIRED FOR A COMPLETE WORKABLE INSTALLATION.
3. COORDINATE THE LOCATIONS OF ALL CEILING DIFFUSERS, REGISTERS AND GRILLES WITH THE ARCHITECTURAL REFLECTIVE CEILING PLAN, ELECTRICAL LIGHTING LAYOUT AND ARCHITECTURAL ROOM ELEVATIONS.
4. CONTRACTOR SHALL VERIFY THE CONDITION OF EXISTING EQUIPMENT, DUCTWORK, ASSOCIATED CONTROLS, AND T-STATS. SHOULD ANY OF THESE ITEMS NOT BE PERFORMING SATISFACTORILY OR MALFUNCTIONING, CONTRACTOR SHALL NOTIFY THE DISTRICT AND PROVIDE PRICE TO ENSURE PROPER OPERATION PRIOR TO COMPLETION OF WORK.
5. BEFORE COMMENCEMENT OF WORK, THE MECHANICAL CONTRACTOR SHALL VERIFY THE EXACT LOCATIONS AND DIMENSIONS OF ALL EXISTING EQUIPMENT AND ELECTRICAL SERVICES IN THE AREA OF NEW CONSTRUCTION AND NOTIFY THE DISTRICT OF ANY DISCREPANCIES.
6. GENERAL CONTRACTOR SHALL PATCH ALL OPENINGS IN WALLS, ROOF, ETC. THAT WILL NOT BE REUSED FOR FUTURE WORK. COORDINATE AS NECESSARY WITH OTHER TRADES.
7. CONTRACTOR TO FIELD VERIFY DIMENSIONS PRIOR TO FABRICATION AND INSTALLATION.
8. CONTRACTOR SHALL BALANCE SYSTEM TO CFM INDICATED.

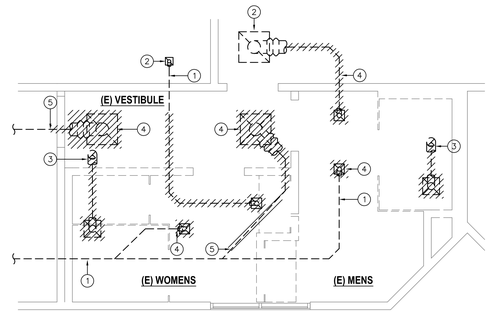
CONSTRUCTION KEYNOTES:

1. (E) DUCT TO REMAIN.
2. (E) DIFFUSER/GRILLE TO REMAIN.
3. POC (E) DUCTWORK TO (N) CEILING-MOUNTED EXHAUST FAN. EXTEND DUCT AND TRANSITION AS REQUIRED.
4. (E) DUCTWORK TO BE CAPPED.
5. PROVIDE (N) REMOTE CABLE OPERATED DAMPERS IN (E) DUCT.

NORTH

MECHANICAL ENLARGED PROPOSED STAFF RESTROOM PLAN

SCALE 1/4"=1'-0" | 2



DEMOLITION NOTES:

1. DISTRICT SHALL HAVE FIRST RIGHT OF REFUSAL ON ALL ITEMS TO BE REMOVED. CONTRACTOR SHALL VERIFY ALL SUCH ITEMS WITH DISTRICT PRIOR TO REMOVAL. ALL ITEMS NOT REFUSED BY DISTRICT SHALL BE REMOVED INTACT AND FULLY FUNCTIONAL BY CONTRACTOR AND RETURNED TO DISTRICT. ALL ITEMS REFUSED BY DISTRICT SHALL BE PROPERLY DISPOSED OF BY CONTRACTOR.
2. CONTRACTOR SHALL RE-USE EXISTING OPENINGS IN WALLS AND ROOF WHEREVER POSSIBLE. COORDINATE WITH OTHER TRADES AS NECESSARY. GENERAL CONTRACTOR SHALL MODIFY OPENING AS REQUIRED TO ACCOMMODATE NEW MECHANICAL DEVICE.
3. GENERAL CONTRACTOR SHALL PATCH ALL OPENINGS IN WALLS, ROOF, ETC. THAT WILL NOT BE REUSED FOR FUTURE WORK. COORDINATE AS NECESSARY WITH OTHER TRADES.
4. PRIOR TO ANY WORK BEING DONE CONTRACTOR SHALL MAKE A CAREFUL EVALUATION OF THE EXISTING CONDITIONS AND VERIFY ALL METHODS OF REMOVAL AND INSTALLATION OF MECHANICAL EQUIPMENT.
5. CONTRACTOR SHALL COORDINATE ALL DEMOLITION WORK WITH THE WORK OF ALL OTHER TRADES.

DEMOLITION KEYNOTES:

1. (E) DUCT TO REMAIN.
2. (E) DIFFUSER/GRILLE TO REMAIN.
3. (E) EXHAUST DUCT UP THRU ROOF TO REMAIN. (E) DUCTWORK EXHAUST FAN TO BE DEMOLISHED AND REMOVED.
4. (E) DUCTWORK AND DIFFUSER/GRILLE TO BE DEMOLISHED REMOVED.
5. (E) DUCTWORK TO BE CAPPED.

NORTH

MECHANICAL ENLARGED EXISTING/DEMO STAFF RESTROOM PLAN

SCALE 1/4"=1'-0" | 1

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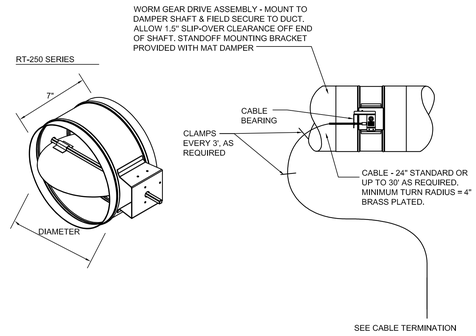
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MECH. DEMOLITION AND NEW FLOOR PLAN

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M2-1

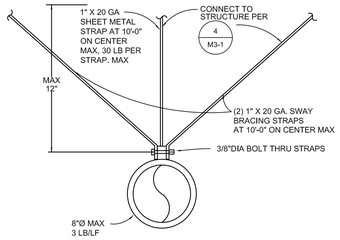


NOTES:
STANDARD DAMPER CONSTRUCTION:
1. GALVANIZED STEEL WITH ROLLED BEAD STIFFENERS - 22 TO 18 GA.
2. REINFORCED BLADE, SELF LUBRICATING BEARINGS
3. WORM GEAR MOUNTING PLATE
4. 3/8" SQUARE (FLAT/FLAT) AXLES ASSURES NON SLIP CONNECTION
5. OPERATING TEMPERATURE = -40° - 200° F.
6. MAX VELOCITY = 1500 FPM
7. FURNISHED 1/8" UNDERSIZED FOR MALE SLIP-IN

CABLE TERMINATION :
1. RT-CCM ROUND MINIATURE CEILING CUP
2. RT-MB MOUNTING BRACKET
3. US PATENT #5,702,298; CANADIAN PATENT #2,185,311

TYPICAL REMOTE CABLE CONTROL SYSTEM DETAIL

SCALE: NONE | 6



NOTES:
1. BRACING IS NOT REQUIRED PROVIDED DUCT WEIGHT DOES NOT EXCEED 20 LB/LF AND PROVISIONS ARE MADE TO AVOID IMPACT WITH LARGER DUCTS OR OTHER MECHANICAL COMPONENTS.

TYPICAL ROUND DUCT ANCHORAGE DETAIL

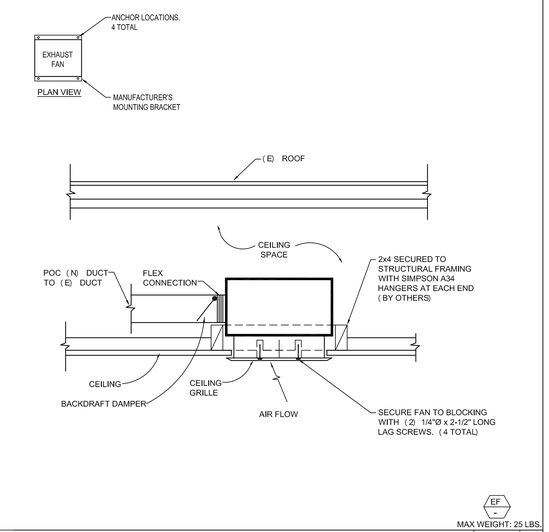
SCALE: NONE | 3



LEGEND:
(E) PROVIDED BY ELEC.
(M) PROVIDED BY MECH.

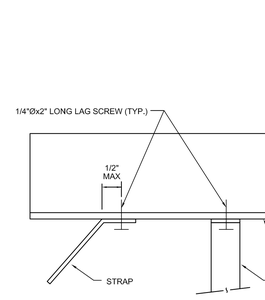
TYPICAL EXHAUST FAN WIRING DIAGRAM DETAIL

SCALE: NONE | 5



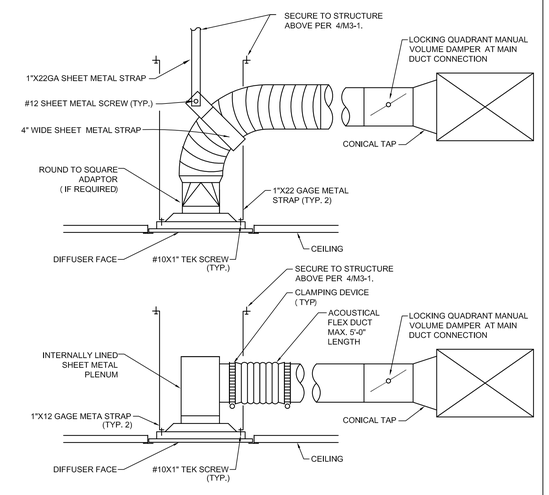
TYPICAL CEILING EXHAUST FAN ANCHORAGE DETAIL

SCALE: NONE | 2



TYPICAL SUPPORT STRAP ANCHORAGE DETAIL

SCALE: NONE | 4



NOTE:
FLEXIBLE DUCT SHALL NOT EXCEED 5'-0" IN LENGTH AND SHALL NOT BE USED IN LIEU OF A RIGID ELBOW OR TRANSITION PER CMC REQUIREMENTS.

TYP. CEILING DIFFUSER DETAIL

SCALE: NONE | 1

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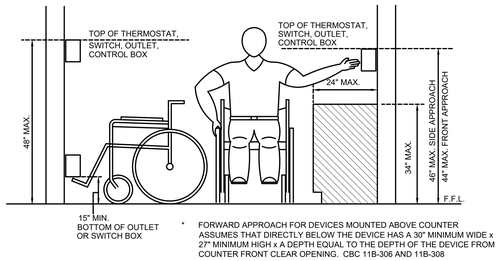
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MECHANICAL DETAILS

drawing no.:
M3-1



* FORWARD APPROACH FOR DEVICES MOUNTED ABOVE COUNTER ASSUMES THAT DIRECTLY BELOW THE DEVICE HAS A 30" MINIMUM WIDE x 27" MINIMUM HIGH x A DEPTH EQUAL TO THE DEPTH OF THE DEVICE FROM COUNTER FRONT CLEAR OPENING. CBC 11B-306 AND 11B-308

MOUNTING HEIGHT OVER OBSTRUCTION DETAIL | NTS | 1

ELECTRICAL SYMBOL LIST

SYMBOL	DESCRIPTION
———	CONDUIT RUN, CONCEALED IN CEILING, WALLS OR BELOW ROOF. CONDUIT MAY BE CONCEALED BELOW SLAB AS PERMITTED BY ENGINEER.
— — —	CONDUIT RUN, EXPOSED.
- - - - - -	CONDUIT RUN CONCEALED UNDERGROUND, BELOW GRADE OR SLAB.
———]	CONDUIT STUBBED OUT AND CAPPED. PULL LINE IN PLACE.
~~	FLEXIBLE CONDUIT. SEALTITE WHERE EXPOSED TO WEATHER. REFER TO SPECIFICATIONS FOR USE.
#10	CROSS LINES ON CONDUIT RUNS INDICATE NUMBER OF #12 WIRES CONTAINED THEREIN. GROUND WIRE IS REQUIRED BUT NO INDICATED. TWO #12 ARE INDICATED WHEN CROSS LINES ARE NOT SHOWN. NUMERALS ADJACENT TO CROSS LINES ON CONDUIT RUNS INDICATE SIZE OF CONDUCTORS IN LIEU OF #12.
B–1,3,5–7	CONDUIT HOME RUN TO PANELBOARD. LETTER AND NUMERALS INDICATES ELECTRICAL PANEL AND CIRCUIT NUMBER. CIRCUITS 1,3,5 WITH SHARED NEUTRAL AND CIRCUIT 7 WITH DEDICATED NEUTRAL.
FACP	FIRE ALARM CONTROL PANEL DESIGNATION.
FAA	FIRE ALARM ANNUNICATOR PANEL DESIGNATION.
FATC	FIRE ALARM TERMINAL CABINET & REMOTE POWER SUPPLY DESIGNATION.
○	REFERENCE NOTE DESGINATION.
(N)	NEW EQUIPMENT.
EN	EXISTING CONDUIT WITH NEW CONDUCTORS OR CABLES
V.L.	VERIFY EXACT LOCATION IN FIELD.
U.O.N	UNLESS OTHERWISE NOTED.
WP	WEATHERPROOF.
WR	WEATHER RESISTANT RECEPTACLE.
C.O.	CONDUIT ONLY, WITH PULL ROPE.
GFI	"GFI" ADJACENT TO SYMBOL INDICATES GROUND FAULT INTERRUPTING TYPE RECEPTACLE.

DEMOLITION NOTES

1. IN GENERAL, THE DEMOLITION PLAN SHOWS ALL EXISTING EQUIPMENT THAT IS TO BE REMOVED. HOWEVER, ELECTRICAL EQUIPMENT, WHETHER SHOWN ON THIS DRAWING OR NOT, THAT IS LOCATED IN REMOVED WALL OR CEILING, SHALL BE REMOVED UNLESS OTHERWISE NOTED.
2. ALL CIRCUIT NUMBERS AND EXISTING CONDUIT HOMERUNS SHOWN ON THESE DRAWINGS WERE TAKEN FROM EXISTING AS BUILT DRAWINGS. IT SHALL BE THIS CONTRACTOR'S RESPONSIBILITY TO VERIFY LOCATIONS OF HOMERUNS AND ADJUST CIRCUIT NUMBERS ACCORDING TO EXISTING CONDITIONS IF REQUIRED.
3. EXISTING CIRCUITS THAT ARE REMOVED AND NOT RE–USED SHALL BE IDENTIFIED ON PANEL SCHEDULE AS "SPARE".
4. THE ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE OWNER PRIOR TO REMOVAL OF EXISTING ELECTRICAL EQUIPMENT AND TURN OVER REMOVED EQUIPMENT THAT THE OWNER REQUESTS, IN AS–FOUND CONDITION. EQUIPMENT THAT IS TO BE TURNED OVER SHALL BE BOXED AND TAGGED TO IDENTIFY THE SPECIFIC EQUIPMENT.
5. WHERE EXISTING WALLS HAVE BEEN REMOVED, AND THERE ARE EXISTING CONDUIT FEEDS WHICH HAVE BEEN CUT–OFF AND CAPPED FLUSH WITH FLOOR, IT IS THE CONTRACTOR'S RESPONSIBILITY TO IDENTIFY AND DIMENSION ALL SUCH CONDUITS ON THE "AS–BUILT" DRAWINGS.
6. EXISTING CONDUIT FEEDS UP THROUGH THE FLOOR SHALL BE CUT OFF AND PLUGGED FLUSH WITH THE FLOOR WHERE EXISTING WALLS, ETC, ARE REMOVED. REMOVE CONDUITS FROM THE POINT BACK TO LAST OUTLET REMAINING IN SERVICE.
7. IT IS THE INTENT OF THESE OUTLINE REQUIREMENTS FOR THE DEMOLITION WORK TO BE USED AS A GUIDE LINE. CONTRACTOR SHALL VERIFY EXISTING CONDITION IN FIELD.
8. THE CONTRACTOR SHALL VISIT THE SITE AND MAKE SURVEY OF EXISTING CONDITIONS WHICH MAY AFFECT OR BE AFFECTED BY THE WORKER UNDER THIS SECTION. REFERENCE MADE IN THESE SPECIFICATIONS OR ON THE DRAWINGS TO EXISTING WORK OR CORRECTNESS OF WAYS AND MEANS OF PERFORMING SHALL BE SUBJECT TO VERIFICATIONS BY THE CONTRACTOR IN HIS SURVEY AND ON THE PROGRESS OF THE WORK.
9. IN PANELS, PULLBOXES, OUTLETS BOXES, GUTTERS, ETC., CONDUCTOR SHALL BE TIED WITH PLASTIC TIES, NEATLY FANNED OUT AND TAGGED WITH ADHESIVE MARKERS WHICH ARE CLEARLY MARKED WITH CIRCUIT NUMBERS, ALL IN AN APPROVED WORKMANLIKE MANNER.
10. IT SHALL BE THIS CONTRACTOR'S RESPONSIBILITY TO DO ALL CORING, CUTTING, PATCHING AND REFINISHING OF EXISTING WALLS AND SURFACES WHEREVER IT IS NECESSARY FOR HIM TO PENETRATE FOR HIS WORK. ALL OPENINGS MADE SHALL BE SEALED TO MEET THE RATED INTEGRITY OF THE PARTICULAR WALL, OR FLOOR.
11. IT SHALL BE THE RESPONSIBILITY OF THIS CONTRACTOR TO MAINTAIN CONTINUITY OF EXISTING SYSTEM, EQUIPMENT, ETC. REMAINING IN OPERATION. WHERE AN EXISTING OUTLET DEVICE IS BEING FED BY AN ABANDONED OUTLET, MAINTAINING CONTINUITY SHALL CONSIST OF RE–ROUTING OF CONDUIT, WIRE, ETC. AS REQUIRED.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE EXACT LOCATION OF ALL NEW DEVICES, AS INDICATED ON DRAWINGS, TO INSURE THAT DEVICES WILL NOT INTERFERE WITH ANY EXISTING EQUIPMENT.
13. REMOVE ALL ABANDONED OR UNUSED APPLIANCES, DEVICES, CONDUCTORS, CONDUITS OR RACEWAYS AND ALL ELECTRICAL SYSTEMS IN THE AREA OF WORK.

APPLICABLE CODES

2025 CALIFORNIA ADMINISTRATIVE CODE, PART 1, TITLE 24 C.C.R.
2025 CALIFORNIA BUILDING CODE (CBC), PART 2, TITLE 24 C.C.R.
2025 CALIFORNIA ELECTRICAL CODE (CEC), PART 3, TITLE 24 C.C.R.
2025 CALIFORNIA MECHANICAL CODE (CMC) PART 4, TITLE 24 C.C.R.
2025 CALIFORNIA PLUMBING CODE (CPC), PART 5 TITLE 24 C.C.R.
2025 CALIFORNIA ENERGY CODE (CEC), PART 6, TITLE 24 C.C.R.
2025 CALIFORNIA WILDLAND–URBAN INTERFACE CODE (CWUIC), PART 7, TITLE 25 C.C.R.
2025 CALIFORNIA FIRE CODE (CFC), PART 9, TITLE 24 C.C.R.
2025 CALIFORNIA GREEN BUILDING STANDARDS CODE (CALGREEN), PART 11, TITLE 24 C.C.R.
2025 CALIFORNIA REFERENCED STANDARDS, PART 12, TITLE 24 C.C.R.
TITLE 19 C.C.R., PUBLIC SAFETY, STATE FIRE MARSHAL REGULATIONS.

GENERAL NOTES

1. ALL ITEMS SUCH AS SERVICE CONDUITS, CONDUCTORS, DUCTS, PAD MOUNT, RISERS, PULLBOX AND PROTECTIVE COVERING FROM SERVICE POLE LOCATION SHALL BE PROVIDED AND/OR INSTALLED AND SHALL BE VERIFIED WITH UTILITY COMPANY. THE CONTRACTOR SHALL INSTALL THE SERVICE IN COMPLIANCE WITH THE SERVING UTILITY COMPANY AND PAY ALL CHARGES LEVIED BY THE SERVING UTILITY COMPANY FOR THIS SERVICE AND EXCEPTING FIRST BILLING DEPOSIT.
2. ALL TELEPHONE WORK SHALL BE IN THE COMPLIANCE WITH THESE DRAWINGS AND REQUIREMENTS OF THE TELEPHONE COMPANY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE TELEPHONE COMPANY AND RECEIVE COMPLETE INFORMATION ON THEIR REQUIREMENTS PRIOR TO SUBMISSION OF THE BID. THE ACT OF SUBMITTING THE BID SHALL CONSTITUTE THE FULL RESPONSIBILITY OF THE CONTRACTOR TO INSTALL SERVICE IN COMPLIANCE WITH THE SERVING UTILITY AND TO PAY ALL CHARGES LEVIED BY THE SERVING UTILITY.
4. THE CONTRACTOR SHALL SECURE AND PAY FOR PERMITS AND FEES NECESSARY FOR EXECUTION AND COMPLETION OF ELECTRICAL WORK, INCLUDING ALL CHARGES BY THE LOCAL GOVERNMENT AGENCIES.
5. ALL OUTLETS LOCATION SHALL BE COORDINATED WITH ARCHITECTURAL ELEVATIONS PRIOR TO INSTALLATION.
6. THIS CONTRACTOR SHALL SUPPLY POWER TO AND MAKE CONNECTION TO ALL MOTORS AND EQUIPMENT REQUIRING ELECTRICAL CONNECTIONS AS SHOWN ON THE MECHANICAL AND PLUMBING DRAWINGS, INCLUDING ALL FRACTIONAL HORSEPOWER MOTORS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REVIEW THE DRAWINGS OF THE MECHANICAL AND PLUMBING DRAWINGS FOR DUCTS, LINES AND EQUIPMENT.
7. SEE SINGLE LINE DIAGRAM FOR CONDUIT AND CONDUCTOR SIZES, PANEL, TRANSFORMERS, MOTOR CONTROL CENTERS, MECHANICAL EQUIPMENT, ETC. HOMERUNS TO PANELS MAY NOT BE SHOWN ON PLANS BUT IS PART OF THE CONTRACT.
8. UNLESS OTHERWISE NOTED ALL RECESSED PANELS AND CABINETS SHALL HAVE (4) 3/4"C.O. SPARE CONDUITS STUBBED UP INTO ACCESSIBLE CEILING SPACE AND CAPPED.
9. UNLESS OTHERWISE NOTED MOUNTING HEIGHTS INDICATED ON ELECTRICAL OUTLETS ARE FROM FINISHED FLOOR TO CENTER OF OUTLETS.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CUT–OUTS IN THE TILE OR COUNTER SPLASHES WHERE RECEPTACLES, OUTLETS, ETC., OCCUR.
11. ATTENTION IS CALLED TO THE FACT THAT THE CEILING SYSTEMS FOR THE MOST PART ARE CONSIDERED TO BE INACCESSIBLE. THEREFORE, THE CONTRACTOR MUST STRATEGICALLY LOCATE BOXES, ETC., WHICH MUST BE CONSIDERED READILY ACCESSIBLE.
12. NO CONDUIT SHALL BE RUN HORIZONTALLY IN CONCRETE FLOOR SLABS.
13. ALL WIRING AND ELECTRICAL EQUIPMENT INSTALLED FOR MECHANICAL AND PLUMBING EQUIPMENT SHALL BE IN ACCORDANCE WITH THESE DRAWINGS AND THE WIRING DIAGRAMS ON THE MECHANICAL AND PLUMBING DRAWINGS.
14. ALL FINAL CONNECTION TO OWNER FURNISHED AND MECHANICAL EQUIPMENT SHALL BE MADE BY THE ELECTRICAL CONTRACTOR.
15. USE OF POWDER DRIVEN CONCRETE FASTENERS:

    USE OF POWER DRIVEN CONCRETE FASTENERS FOR TENSION LOADS IS LIMITED TO SUPPORT OF MINOR LOADS LIKE ACOUSTICAL CEILINGS, DUCT WORK, CONDUIT.

    ALLOWABLE LOADS – IN GENERAL, LOADS SHOULD BE LIMITED TO LESS THAN 100 POUNDS. HOWEVER, GREATER LOADS MAY BE PERMITTED FOR SPECIAL CASES WHEN APPROVED BY THE CHECKING SUPERVISOR FIELD ENGINEER.

    TESTING – THE OPERATOR, TOOL AND FASTENER SHALL BE PREQUALIFIED BY THE PROJECT INSPECTOR. HE SHALL OBSERVE THE TESTING OF THE FIRST 10 FASTENER INSTALLATIONS. A TEST "PULL–OUT" LOAD WHICH IS NOT LESS THAN TWICE THE DESIGN LOAD OR 200 POUNDS, WHICHEVER IS GREATER, SHALL BE APPLIED TO THEPIN IN SUCH A MANNER AS NOT TO RESIST THE SPALLING TENDENCY OF THE CONCRETE SURROUNDING THE PIN. THEREAFTER, RANDOM TEST UNDER THE PROJECT INSPECTOR'S SUPERVISION SHALL BE TESTED. SHOULD FAILURE OCCUR ON ANY PIN TESTED, ALL INSTALLATION MUST BE TESTED AND UNFAIR PINS REPLACED.

    THESE REQUIREMENTS ARE TO BE NOTED ON THE PLANS, OR IN THE SPECIFICATIONS.
16. THE SCOPE OF WORK SHALL INCLUDE FURNISHING ALL LABOR, MATERIALS, EQUIPMENT, TOOLS AND SERVICES REQUIRED FOR THIS COMPLETE INSTALLATION OF THE ELECTRICAL SYSTEMS AS INDICATED AND SPECIFIED. ALL WORK SHALL BE NEW UNLESS NOTED OR SHOWN OTHERWISE.
17. CONTRACTOR SHALL VISIT THE SITE INCLUDING SPECIFICALLY ALL AREAS INDICATED ON THE DRAWINGS. HE SHALL THOROUGHLY FAMILIARIZE HIMSELF WITH THESE EXISTING CONDITIONS AND BY SUBMITTING A BID ACCEPTS CONDITIONS UNDER WHICH HE WILL BE REQUIRED TO PERFORM HIS WORK.
18. ALL ELECTRICAL EQUIPMENT MATERIAL AND DETAILS OF INSTALLATION SHALL CONFORM TO THE REQUIREMENTS OF THE 2022 CALIFORNIA ELECTRICAL CODE OF THE NATIONAL BOARD OF FIRE UNDERWRITERS, OF THE STATE OF CALIFORNIA TITLE 24, BASIC ELECTRICAL REGULATIONS OF THE STATE FIRE MARSHAL AND OTHER APPLICABLE CODES. NOTHING IN THE PLANS OR THESE SPECIFICATIONS SHALL BE CONSTRUED AS PERMITTING WORK NOT CONFORMING TO THE MOST STRINGENT OF THE APPLICABLE CODES.
19. THE BIDDER SHALL VISIT THE SITE AND MAKE A SURVEY OF EXISTING CONDITIONS WHICH MAY AFFECT OR BE AFFECTED BY THE WORK UNDER THIS SECTION. REFERENCE MADE IN THE SPECIFICATIONS OR ON THE DRAWINGS TO EXISTING WORK OR CORRECTNESS OF WAYS AND MEANS OF PERFORMING SHALL BE SUBJECT TO VERIFICATIONS BY THE CONTRACTOR IN HIS SURVEY AND ON THE PROGRESS OF THE WORK
20. WIRE SHALL BE COPPER TYPE THWN OR THHN. MINIMUM WIRE SIZE SHALL BE #12 AWG UNLESS NOTED OTHERWISE. WIRES SMALLER THAN #6 AWG SHALL BE SOLID AND #6 AWG AND LARGE SHALL BE STRANDED.
21. SPLICES IN #10 AWG AND SMALLER CONDUCTORS SHALL BE MADE WITH CONICAL SHAPED SPRING STEEL CONNECTORS PLATED FOR CORROSION PROTECTION. CONNECTORS MAY HAVE AN INSULATING, SEMI–RIGID OUTER SHELL. TWIST ON CONNECTORS OF PHENOLIC COMPOUND OR CRIMP–TYPE CONNECTIONS SHALL NOT BE USED.
22. WHEREVER CONDUCTORS ARE SPLICED OR TERMINATED IN A JUNCTION OR PULLBOX THEY SHALL BE MARKED WITH THEIR CIRCUIT NUMBER USING "BRADY" ADHESIVE MARKERS.
23. ALL CONDUIT SHALL BE ELECTRICAL METALLIC TUBING (EMT) AND RIGID STEEL CONDUIT INCLUDING COUPLING, CONNECTORS AND OTHER FITTINGS SHALL BE GALVANIZED OR SHERARDIZED. FITTINGS FOR EMT SHALL BE GLAND RING, WATER TIGHT COMPRESSION TYPE. UNLESS NOTES OTHERWISE
24. FLEXIBLE STEEL CONDUIT SHALL BE GALVANIZED WITH FLEXIBLE OR CADMIUM–PLATED CONNECTORS OF THE TWIST–IN TYPE. FLEXIBLE CONDUIT SHALL ONLY BE USED AS APPROVED BY THE ENGINEER.
25. ALL EMPTY CONDUITS SHALL HAVE A 1/8" DIAMETER NYLON PULL CORD UNLESS OTHERWISE SPECIFIED.
26. ALL CONDUITS RUN EXPOSED SHALL BE INSTALLED PARALLEL OR AT RIGHT ANGLES TO BUILDING CONSTRUCTION.
27. NO SPLICES ARE TO BE MADE IN UNDERGROUND PULLBOXES.
28. BOXES SHALL BE GALVANIZED OR SHERARDIZED ONE PIECE PRESSED STEEL KNOCKOUT TYPE. MINIMUM SIZE BOX SHALL BE 4" BY 1 1/2" DEEP UNLESS OTHERWISE SPECIFIED OR INDICATED. BOXES SHALL HAVE PLASTER RINGS AS REQUIRED.
29. WIRING INSTALLED CONCEALED ABOVE GROUND IN DRY PLACES NOT IN CONCRETE WHERE NOT SUBJECT TO MECHANICAL DAMAGE SHALL BE IN EMT OR RIGID STEEL CONDUIT.
30. EXACT ROUTING OF ALL CONDUIT WITHIN EXISTING BUILDING SHALL BE DETERMINED BY THE CONTRACTOR. ANY COST REQUIRED TO ROUTE CONDUIT DIFFERENT THAN IS SHOWN ON THESE DRAWINGS SHALL BE INCURRED BY THE CONTRACTOR.
31. THE CONTRACTOR SHALL SECURE AND PAY FOR PERMITS AND FEES NECESSARY FOR EXECUTION AND COMPLETION OF ELECTRICAL WORK, INCLUDING ALL CHARGES BY THE LOCAL GOVERNMENT AND STATE AGENCIES.
32. IT SHALL BE THIS CONTRACTOR'S RESPONSIBILITY TO DO ALL CORING, CUTTING, PATCHING AND REFINISHING OF EXISTING WALLS AND SURFACES WHEREVER IT IS NECESSARY FOR HIM TO PENETRATE FOR HIS WORK. ALL OPENINGS MADE SHALL BE SEALED TO MEET THE RATED INTEGRITY OF THE PARTICULAR WALL, FLOOR OR CEILING.
33. EXACT METHOD AND LOCATION OF CONDUIT PENETRATION AND/OR OPENINGS IN CONCRETE WALLS OR FLOORS SHALL BE DIRECTED BY THE STRUCTURAL ENGINEER.
34. ALL ELECTRICAL EQUIPMENT SHALL BE EMBRACED OR ANCHORED TO RESIST A HORIZONTAL FORCE OF 20% OF ITS OPERATING WEIGHT ACTING IN ANY DIRECTION. WHERE ANCHORAGE DETAILS ARE NOT SHOWN ON THE DRAWINGS THE FIELD INSTALLATION SHALL BE SUBJECT TO THE APPROVAL OF THE ELECTRICAL ENGINEER.
35. FINAL INSPECTION AND ACCEPTANCE: AFTER ALL REQUIREMENTS OF THE SPECIFICATIONS AND/OR THE DRAWINGS HAVE BEEN FULLY COMPLETED, REPRESENTATIVES OF THE OWNER WILL INSPECT THE WORK. CONTRACTOR SHALL PROVIDE COMPETENT PERSONAL TO DEMONSTRATE THE OPERATION OF ANY ITEM OR SYSTEM, TO THE FULL SATISFACTION OF EACH REPRESENTATIVE. FINAL ACCEPTANCE OF THE WORK WILL BE MADE BY THE OWNER AFTER RECEIPT OF APPROVAL AND RECOMMENDATION OF ACCEPTANCE FROM EACH REPRESENTATIVE.
36. SHOP DRAWINGS SHALL BE SUBMITTED WITHIN TEN (10) DAYS AFTER AWARD OF THE CONTRACT. SUBMIT SIX (6) COPIES OF A COMPLETE LIST OF MATERIALS AND EQUIPMENT PROPOSED FOR THE JOB, INCLUDE JOB DESCRIPTION ARCHITECT, AND ENGINEER IDENTIFICATION; ALL DATA WITH CAPACITIES, SIZES, DIMENSIONS, CATALOG NUMBERS, MANUFACTURER'S BROCHURES, ETC.
37. THE CONTRACTOR SHALL FURNISH ONE (1) YEAR WRITTEN GUARANTEE ON MATERIALS AND WORKMANSHIP FROM DATE OF ACCEPTANCE.
38. THE CONTRACTOR SHALL MAINTAIN A COMPLETE SET OF RECORD DRAWINGS AND AFTER COMPLETION OF HIS WORK TURN THEM OVER TO THE ENGINEER/OWNER.
39. ALL FIRE ALARM DEVICES SHALL BE U.L. LISTED AND APPROVED BY THE CALIFORNIA STATE FIRE MARSHAL.
40. CONTRACTOR OPERATIONS SHALL NOT BLOCK, HINDER, IMPEDE OR OTHERWISE INHIBIT THE USE OF REQUIRED EXITS AT ANY TIME. CONTRACTOR SHALL MAINTAIN UNOBSTRUCTED ACCESS TO FIRE EXTINGUISHERS, FIRE HYDRANTS, TEMPORARY FIRE PROTECTION FACILITIES, STAIRWAYS, AND OTHER ACCESS ROUTES FOR FIRE–FIGHTING EQUIPMENT AND/OR PERSONNEL.

MEP EQUIPMENT ANCHORAGE NOTE

MEP EQUIPMENT ANCHOARAGE 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 2025 CBC, SECTIONS 1617A.1.18 THROUGH 1617A.1.26 AND ASCE 7–22 CHAPTERS 13, 26 AND 30:

A. ALL PERMANENT EQUIPMENT AND COMPONENTS
B. 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.
C. TEMPORARY, MOVABLE EQUIPMENT THAT 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 REQUIREDTO 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 LONGTUDINAL 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 PROFESIONAL 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.

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 SECTIONS 13.6.5, 13.6.6, 13.6.7, 13.6.8; AND 2025 CBC, SECTIONS 1617A.1.24, 1617A.1.25 AND 1617A.1.26.

THE METHOD OF SHOWING BRACING AND ATTACHMENTS TO THE STRUCTURE FOR THE IDENTIFED 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 OSHPD OPM, WITHIN PROJECT SUBMITTAL.

MP ☐ MD ☐ PP ☐ E ☐ OPTION 3: DESIGN BASED ON OSHPD OPM, DEFERRED SUBMITTAL.

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 04-125584 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 09/01/2026

DIVISION OF THE STATE ARCHITECT
109 VIA FRONTERA, SUITE 300
SAN DIEGO, CA 92127
ph: 858.674.5400 fx: 858.674.5471

DSA Application Number: 04-125584
DSA File Number: 33-15

agency

tBP architecture planning interiors
tBP/Architecture
3990 Concours Street, Suite 201
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architect

REGISTERED PROFESSIONAL ENGINEER
YOWANTO YOWANTO
No. 17238
Exp. 06/30/2028
ELECTRICAL
STATE OF CALIFORNIA

YOWANTO ENGINEERING, INC.
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POMONA, CA 91767
(909) 626–6291

consultant

WILLIAM COLLIER ELEM SCHOOL SHADE STRUCTURE ADDITION & PLAYGROUND IMPROVEMENTS

LAKE ELSINORE UNIFIED SCHOOL DISTRICT
20150 MAYHALL DR.
WILDOMAR, CA. 92595

tBP project number: 24006.00
file name: 26-2298
drawn by: IY checked by: IY
date: 08-20-26

rev:	date:	description:
	07/02/26	DSA SUBMITTAL

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drawing title:
ELECTRICAL GENERAL NOTES & SYMBOLS

drawing no.:
E0-1

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: William Collier ES - Shade Structure	**Report Page:** (Page 1 of 7)
Project Address: 20150 Mayhall Dr.	**Date Prepared:** 7/8/2026

A. GENERAL INFORMATION					
01	Project Location (city)	Wildomar	04	Total Conditioned Floor Area (ft²)	316
02	Climate Zone	10	05	Total Unconditioned Floor Area (ft²)	0
03	Occupancy Types Within Project (select all that apply):		06	# of Stories (Habitable Above Grade)	1
● Support Areas					

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	316	Area Category Method	0
☐ New Lighting System - Parking Garage				
Total Area of Work (ft²)	316		0	

STATE OF CALIFORNIA
Indoor Lighting CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-LTI-E
Project Name: William Collier ES - Shade Structure	**Report Page:** (Page 4 of 7)
	Date Prepared: 7/8/2026

H. INDOOR LIGHTING CONTROLS (Not including PAFs)

Area Level Controls

04	05	06	07	08	09	10	11	12	
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/Sky lit 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	Field Inspector	
								Pass	Fail
Restroom	Restroom	Readily Accessible	NA: Restrooms	Occupancy Sensor	NA: Skylight shaded	NA: Skylight shaded	No	☐	☐
Vestibule	Corridor	Readily Accessible	Dimmer	Occupancy Sensor	NA: Skylight shaded	NA: Skylight shaded	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	
Area Description	Complete Building or Area Category Primary Function Area	Allowed Density (W/ft²)	Area (ft²)	Allowed Wattage (Watts)	Additional Allowance / Adjustment	
					Area Category	PAF
Restroom	Restroom	0.65	316	205.4	No	No
		TOTALS:	316	205.4	See Tables J, or P for detail	

J. ADDITIONAL ALLOWANCE: AREA CATEGORY METHOD QUALIFYING LIGHTING SYSTEM

This section does not apply to this project.

STATE OF CALIFORNIA
Indoor Lighting CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-LTI-E
Project Name: William Collier ES - Shade Structure	**Report Page:** (Page 7 of 7)
Project Address: 20150 Mayhall Dr.	**Date Prepared:** 7/8/2026

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name: Irwan Yowanto, P.E., LC, RCDD	Documentation Author Signature:
Company: Yowanto Engineering, Inc.	Signature Date: 2026-07-08
Address: 2705 N. Towne Ave., Ste. C	CEA/ HERS Certification Identification (if applicable): E-17238
City/State/Zip: Pomona CA 91767	Phone: 909-626-6291

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: Irwan Yowanto, P.E., LC, RCDD	Responsible Designer Signature:
Company: Yowanto Engineering, Inc.	Date Signed: 2026-07-08
Address: 2705 N. Towne Ave., Ste. C	License: E-17238
City/State/Zip: Pomona CA 91767	Phone: 909-626-6291

STATE OF CALIFORNIA
Indoor Lighting CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-LTI-E
Project Name: William Collier ES - Shade Structure	**Report Page:** (Page 2 of 7)
	Date Prepared: 7/8/2026

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 Allowed** (Watts)	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)			(See Table F)	(See Table P)			
Conditioned		205.4	0		=	205	≥ 138	0	=	138	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.

STATE OF CALIFORNIA
Indoor Lighting CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-LTI-E
Project Name: William Collier ES - Shade Structure	**Report Page:** (Page 5 of 7)
	Date Prepared: 7/8/2026

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.

R. 80% LIGHTING POWER FOR ALL ALTERATIONS - CONTROLS EXCEPTIONS

This section does not apply to this project.

STATE OF CALIFORNIA
Indoor Lighting CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-LTI-E
Project Name: William Collier ES - Shade Structure	**Report Page:** (Page 3 of 7)
	Date Prepared: 7/8/2026

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	
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	Field Inspector	
									Pass	Fail
A	1x4 LED	No	NA	23	Mfr. Spec	6	No	138	☐	☐
							Total Designed Watts: CONDITIONED SPACES	138		

[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	
		Pass	Fail
Mandatory Demand Response 110.12(c)	Shut-off controls 130.1(c) / 160.5(b)4C		
NA < 4,000W subject to multilevel	See Area/Space Level Controls	☐	☐

STATE OF CALIFORNIA
Indoor Lighting CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-LTI-E
Project Name: William Collier ES - Shade Structure	**Report Page:** (Page 6 of 7)
	Date Prepared: 7/8/2026

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; Vestibule;

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 04-125584 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 09/01/2026

DIVISION OF THE STATE ARCHITECT
109 VIA FRONTERA, SUITE 300
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ph: 858.674.5400 fx: 858.674.5471

DSA Application Number: 04-125584
DSA File Number: 33-15

agency

tBP architecture planning interiors

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architect

REGISTERED PROFESSIONAL ENGINEER
IRWAN YOWANTO
No. 17238
Exp. 06/30/2028
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WILLIAM COLLIER ELEM SCHOOL
SHADE STRUCTURE ADDITION & PLAYGROUND IMPROVEMENTS

LAKE ELSINORE UNIFIED SCHOOL DISTRICT
20150 MAYHALL DR.
WILDOMAR, CA. 92595

tBP project number: 24006.00

file name: 26-2298

drawn by: IY checked by: IY

date: 08-20-26

rev:	date:	description:
	07/02/26	DSA SUBMITTAL

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drawing title:

INDOOR - TITLE 24

drawing no.:

E0-2

STATE OF CALIFORNIA
Outdoor Lighting CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-LTO-E
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.	
Project Name: William Collier ES - Shade Structure	**Report Page:** (Page 1 of 7)
Project Address: 20150 Mayhall Dr.	**Date Prepared:** 7/8/2026

A. GENERAL INFORMATION

01	Project Location (city)	Wildomar	04	Total Illuminated Hardscape Area (ft²)	0
02	Climate Zone	10			
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				
●	Support Areas				

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
Outdoor Lighting CALIFORNIA ENERGY COMMISSION

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	Date Prepared: 7/8/2026

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		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**
0	+	---	+	---	+	---	+	150	OR	---	=	150	≥	150	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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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
XB	4ft. LED Strip Light	☐ Linear	25	Mfr. Spec	6	New	☐	150	NA: < 6200 lumens	☐	☐
							Total Design Watts:	150			

* 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 05 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 Reinstalled" 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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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
Shade Structure	Astronomical Timer	Provided	Provided	☐	☐

[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.*

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-R 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

J. LIGHTING ALLOWANCE: PER APPLICATION

This section does not apply to this project.

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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.

M. LIGHTING ALLOWANCE: PER SPECIFIC AREA

This table includes areas using the wattage allowance per specific area from Table 140.7-B /Table 170.2-S. More than one specific area allowance may be taken in a single project, if applicable. However, multiple specific area allowances may not be taken for the exact same area on the site.

01	02	03	04	05	06	07	08	09	10
		CALCULATED ALLOWANCE (Watts)			DESIGN WATTS				
Area Description	Specific Area Type per Table 140.7-B	Specific Area (ft²)[1]	Allowed Density (W/ft²)	Extra Allowance (Watts)	Luminaire Name or Item Tag	Watts per Luminaire	# of Luminaires	Design Watts	Additional Allowance (Watts)
Shade Structure	NonSalesCanopy	2511	0.1	344	XB	25	6	150	150
					Total Design Watts for this Area:			150	
							Total Allowance (Watts) All Areas:		150

[1] *FOOTNOTES: See Table 140.7-B /Table 170.2-S for rules for calculating the specific areas (ft²) for these additional lighting allowances.*
[2] *For luminaires indicated in Table F as linear, wattage in column 07 is W/lf instead of Watts/luminaire. Total linear feet should be indicated in column 08 instead of number of luminaires.*

N. EXISTING CONDITIONS POWER ALLOWANCE (alterations only)

This section does not apply to this project.

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CERTIFICATE OF COMPLIANCE	NRCC-LTO-E
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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.	Shade Structure;

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Outdoor Lighting CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-LTO-E
Project Name: William Collier ES - Shade Structure	**Report Page:** (Page 7 of 7)
Project Address: 20150 Mayhall Dr.	**Date Prepared:** 7/8/2026

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name: Irwan Yowanto, P.E., LC, RCDD	Documentation Author Signature:
Company: Yowanto Engineering, Inc.	Signature Date: 2026-07-08
Address: 2705 N. Towne Ave., Ste. C	CEA/ HERS Certification Identification (if applicable): E-17238
City/State/Zip: Pomona CA 91767	Phone: 909-626-6291

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: Irwan Yowanto, P.E., LC, RCDD	Responsible Designer Signature:
Company: Yowanto Engineering, Inc.	Date Signed: 2026-07-08
Address: 2705 N. Towne Ave., Ste. C	License: E-17238
City/State/Zip: Pomona CA 91767	Phone: 909-626-6291

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DATE: 09/01/2026

DIVISION OF THE STATE ARCHITECT
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DSA Application Number: 04-125584
DSA File Number: 33-15

agency

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architect

REGISTERED PROFESSIONAL ENGINEER
IRWAN YOWANTO
No. 17238
Exp. 06/30/2028
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(909) 626-6291

consultant

WILLIAM COLLIER ELEM SCHOOL
SHADE STRUCTURE ADDITION & PLAYGROUND IMPROVEMENTS

LAKE ELSINORE UNIFIED SCHOOL DISTRICT
20150 MAYHALL DR.
WILDOMAR, CA. 92595

tBP project number: 24006.00
file name: 26-2298
drawn by: IY checked by: IY
date: 08-20-26

rev:	date:	description:
	07/02/26	DSA SUBMITTAL

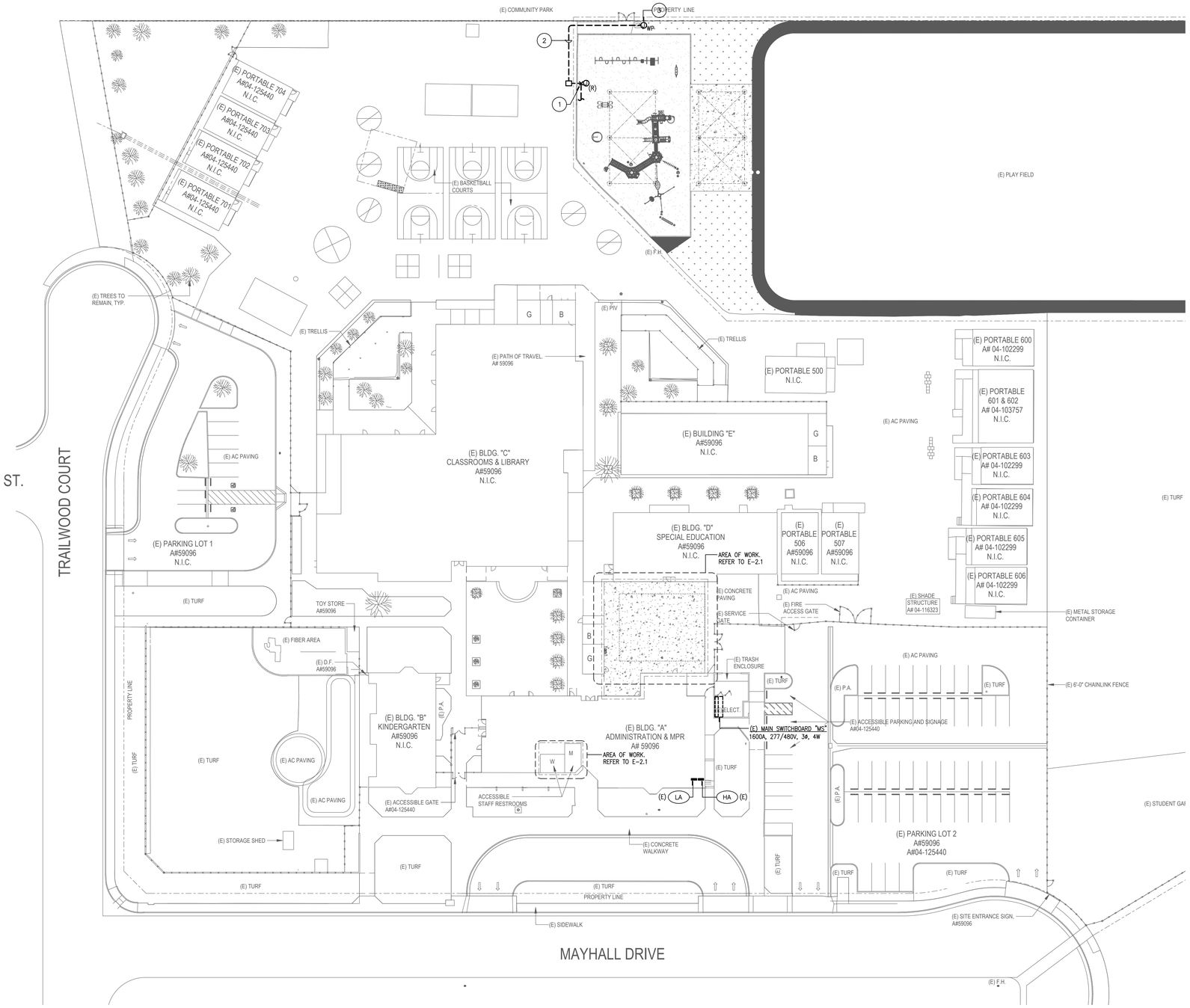
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OUTDOOR - TITLE 24

drawing no.:

E0-3



NOTES

1. REFER TO DRAWING E0.1 FOR GENERAL NOTES.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING AND VERIFYING, THE EXACT LOCATION OF THE "POWER" AND "SIGNAL" PULLBOXES FOR THE PROPER INTERFACE WITH THE UNDERGROUND CONDUIT STUB-UPS.
3. WHERE NEW AND EXISTING CONDUIT STUB-OUTS ARE TO BE INTERCEPTED, THE CONTRACTOR SHALL VERIFY THE ACTUAL ROUTING OF THE NEW AND EXISTING CONDUITS AND DETERMINE THE ACTUAL POINT OF INTERCEPTION THE FIELD.
4. LOCATION OF UNDERGROUND PULLBOXES AND CONDUIT ROUTING INDICATED ON THESE PLANS IS DIAGRAMMATIC. ACTUAL PULLBOX LOCATION AND ROUTING OF UNDERGROUND CONDUITS SHALL BE VERIFIED IN THE FIELD TO AVOID INTERFERENCE WITH OTHER UTILITIES AND TRADES.
5. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO MAINTAIN REQUIRED CLEARANCES BETWEEN UNDERGROUND ELECTRICAL CONDUITS AND FOOTINGS. CONDUIT STUB-UPS SHALL NOT BE INSTALLED IN FOOTINGS, EXACT METHOD FOR STUBBING-UP CONDUITS AT FOOTINGS LOCATIONS SHALL COORDINATED IN THE FIELD WITH THE ARCHITECT.
6. PROTECT EXISTING CONCRETE, WALKWAY, ELECTRICAL FOR TRENCHING TO BE WITHIN ASPHALT AREA UNLESS WHERE NECESSARY. PATCH CONCRETE TO MATCH SURROUNDING WHERE NECESSARY.
7. ALL UNDERGROUND CABLES (POWER AND SIGNAL) SHALL BE THWN-2/THHN-2 RATED FOR UNDERGROUND USE AND WET LOCATION.
8. CONTRACTOR SHALL BE RESPONSIBLE TO SIZE PULL BOXES PER CODE AND PROVIDE NUMBER OF PULL BOXES AS REQUIRED TO ACCOMODATE CONDUITS AND CABLES.
9. REFER TO THE SINGLE LINE DIAGRAM FOR POWER CONDUIT SIZE AND WIRE QUANTITIES.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE WORK ASSOCIATED WITH THE EXPANSION OF THE FIRE ALARM SYSTEM AND THE INTERCOM SYSTEM WITH THE PARTICULAR SYSTEMS MANUFACTURERS REPRESENTATIVE AND PROVIDED REQUIRED SYSTEM HARDWARE AND SOFTWARE FOR A FULLY OPERABLE SYSTEM EXPANSION.
11. WHERE NEW AND EXISTING CONDUIT STUB-OUTS ARE TO BE INTERCEPTED, THE CONTRACTOR SHALL VERIFY THE ACTUAL ROUTING OF THE NEW AND EXISTING CONDUITS AND DETERMINE THE ACTUAL POINT OF INTERCEPTION THE FIELD.
12. LOCATION OF UNDERGROUND PULLBOXES AND CONDUIT ROUTING INDICATED ON THESE PLANS IS DIAGRAMMATIC. ACTUAL PULLBOX LOCATION AND ROUTING OF UNDERGROUND CONDUITS SHALL BE VERIFIED IN THE FIELD TO AVOID INTERFERENCE WITH OTHER UTILITIES AND TRADES.
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14. PROTECT EXISTING CONCRETE, WALKWAY, ELECTRICAL FOR TRENCHING TO BE WITHIN ASPHALT AREA UNLESS WHERE NECESSARY. PATCH CONCRETE TO MATCH SURROUNDING WHERE NECESSARY.
15. ALL CABLES (POWER AND SIGNAL) SHALL BE RATED FOR UNDERGROUND USE AND WET LOCATION.
16. CONTRACTOR SHALL BE RESPONSIBLE TO SIZE PULL BOXES PER CODE AND PROVIDE NUMBER OF PULL BOXES AS REQUIRED TO ACCOMODATE CONDUITS AND CABLES.
17. PROVIDE WATERTIGHT FITTINGS FOR UNDERGROUND AND EXTERIOR CONDUIT INSTALLATIONS.

REFERENCE NOTES

1. DISCONNECT AND REMOVE POWER TO EXISTING IRRIGATION CONTROLLER. INSTALL 11"X17" UNDERGROUND PULL BOX (OR SIZE AS REQUIRED) WITH CONCRETE COVER OUTSIDE PLAYGROUND AREA. EXTEND CONDUIT AND CONDUCTORS TO NEW LOCATION AND SPLICE CONDUCTORS INSIDE NEW PULL BOX. VERIFY EXACT LOCATION IN FIELD.
2. INSTALL NEW UNDERGROUND CONDUIT AND CONDUCTORS:
   1"C-2#8 & 1#10 GND (OR SIZE TO MATCH EXISTING CONDUCTOR SIZE)
   1"C.O. (SPARE)
3. PROVIDE POWER TO NEW IRRIGATION CONTROLLER FOR COMPLETE AND OPERABLE SYSTEM. VERIFY EXACT LOCATION IN FIELD.

1

POWER SITE PLAN
SCALE: 1" = 30'-0"

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tBP architecture planning interiors

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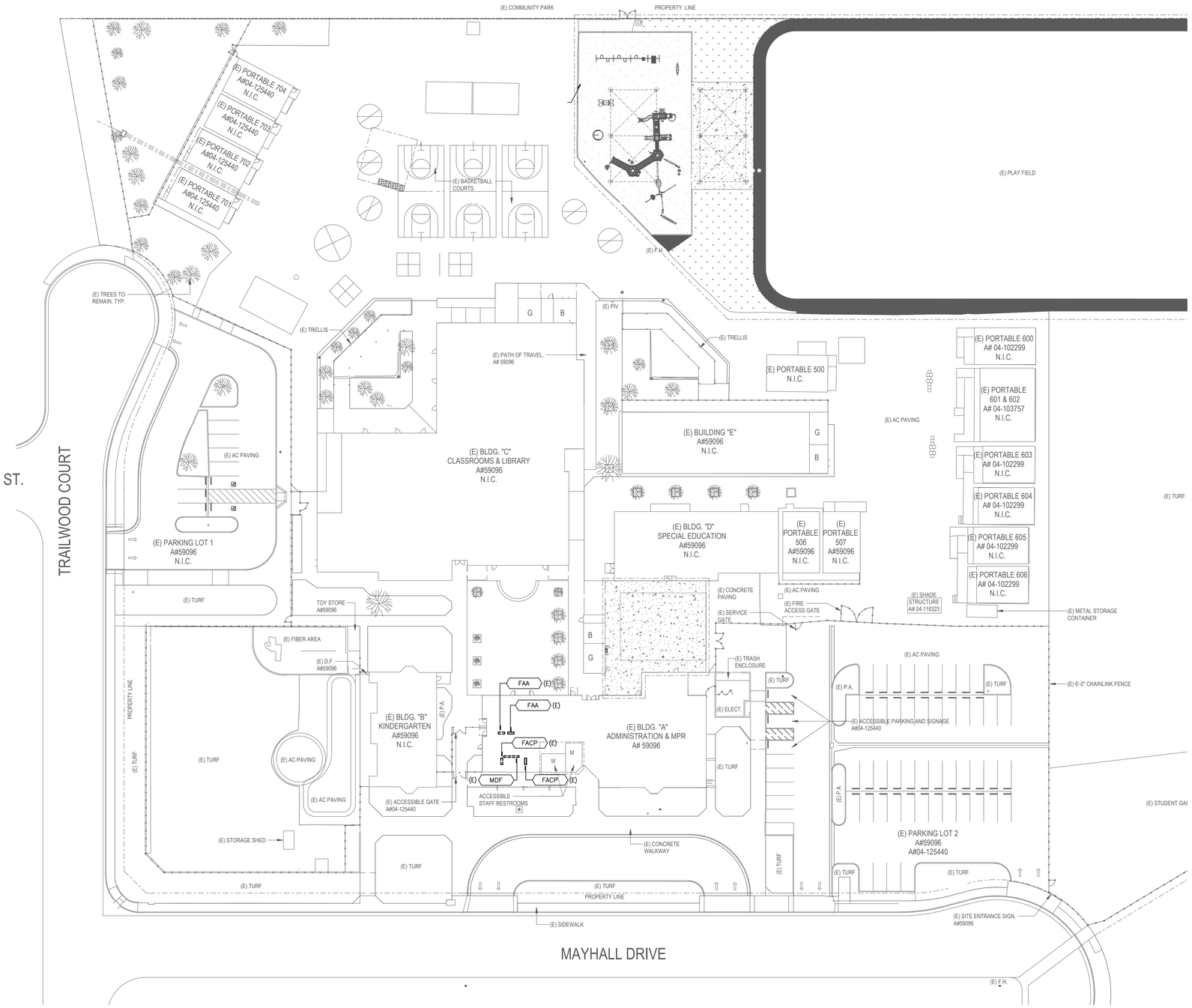
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drawn by: IY checked by: IY
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POWER SITE PLAN

drawing no.:
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NOTES

1. REFER TO DRAWING E0.1 FOR GENERAL NOTES.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING AND VERIFYING, THE EXACT LOCATION OF THE "POWER" AND "SIGNAL" PULLBOXES FOR THE PROPER INTERFACE WITH THE UNDERGROUND CONDUIT STUB–UPS.
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7. ALL UNDERGROUND CABLES (POWER AND SIGNAL) SHALL BE RATED FOR UNDERGROUND USE AND WET LOCATION.
8. CONTRACTOR SHALL BE RESPONSIBLE TO SIZE PULL BOXES PER CODE AND PROVIDE NUMBER OF PULL BOXES AS REQUIRED TO ACCOMODATE CONDUITS AND CABLES.
9. REFER TO DRAWINGS E3.1 FOR FRE ALARM REQUIREMENTS.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE WORK ASSOCIATED WITH THE EXPANSION OF THE FIRE ALARM SYSTEM AND THE INTERCOM SYSTEM WITH THE PARTICULAR SYSTEMS MANUFACTURERS REPRESENTATIVE AND PROVIDED REQUIRED SYSTEM HARDWARE AND SOFTWARE FOR A FULLY OPERABLE SYSTEM EXPANSION.
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17. ROUTE FIRE ALARM CABLE TO EXISTING FACP, FIBER OPTIC/DATA CABLE TO EXISTING IDF SHOWN ON PLAN AND LOW VOLTAGE CABLES TO MAIN HEAD–END EQUIPMENTS FOR COMPLETE AND OPERABLE SYSTEM.
18. PROVIDE WATERTIGHT FITTINGS FOR UNDERGROUND AND EXTERIOR CONDUIT INSTALLATIONS

1

SIGNAL SITE PLAN
SCALE: 1" = 30'-0"

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DSA File Number: 33-15

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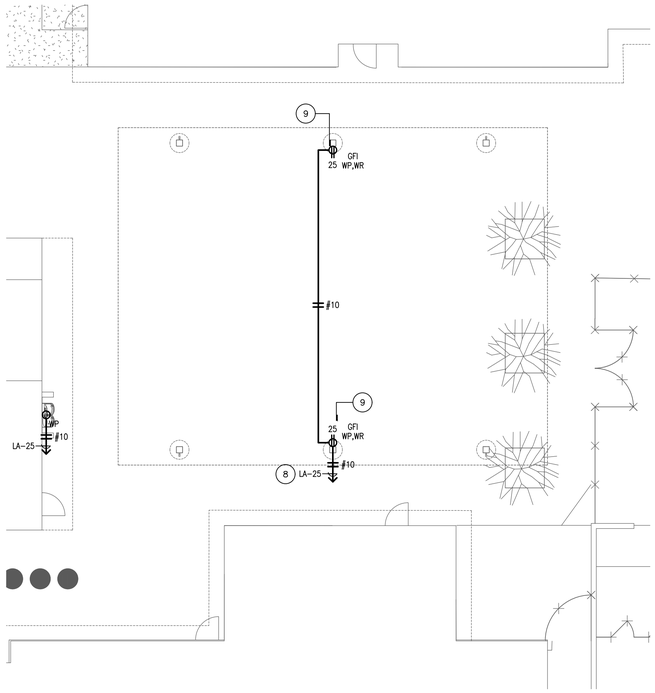
tBP project number: 24006.00
file name: 26-2298
drawn by: IY checked by: IY
date: 08-20-26

rev:	date:	description:
	07/02/26	DSA SUBMITTAL

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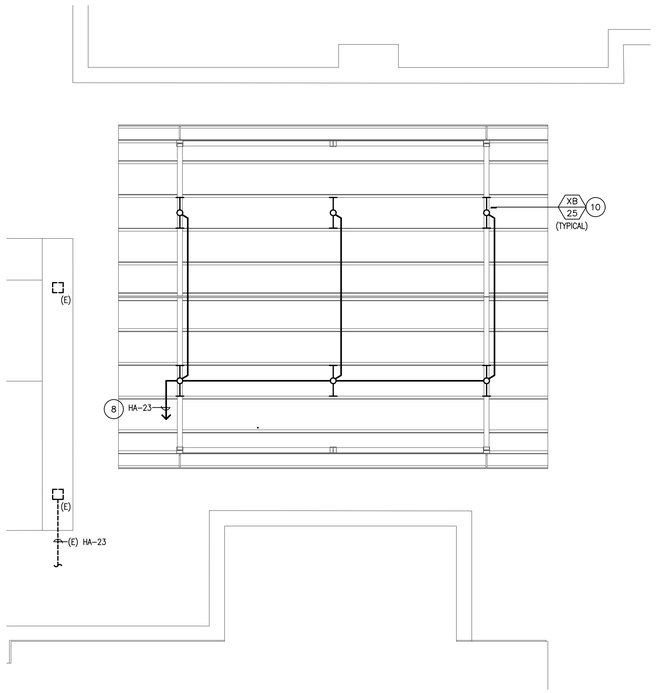
drawing title:
SIGNAL SITE PLAN

drawing no.:
E1-2



2 SHADE STRUCTURE POWER PLAN

SCALE: 1/8" = 1'-0"



1 SHADE STRUCTURE LIGHTING PLAN

SCALE: 1/8" = 1'-0"

NOTES

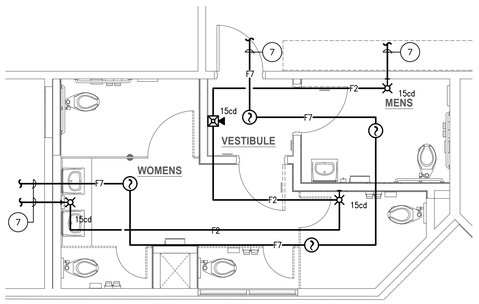
1. THE ELECTRICAL CONTRACTOR TO PROVIDE AND ROUGH-IN ALL NECESSARY LOW VOLTAGE AND FIRE ALARM SYSTEMS BACK BOXES, BUILDING MOUNTED TERMINAL BOXES AND ASSOCIATED CONDUITS (INCLUDING PULL-ROPE), BETWEEN BACK BOX AND TERMINAL BOX. MINIMUM CONDUIT IS 1" CONDUIT.
2. THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL ALL NEW LOW VOLTAGE COMMUNICATION/SIGNAL AND FIRE ALARM DEVICES TO MATCH EXISTING SITE SYSTEMS, HE SHALL ALSO FURNISH AND INSTALL ALL ASSOCIATED CABLING REQUIRED AND MAKE ALL FINAL CONNECTIONS TO PROVIDE A FULLY FUNCTIONAL SYSTEM EXPANSION. COORDINATE ALL SPECIFIC REQUIREMENTS WITH THE LOCAL REPRESENTATIVE FOR "NOTIFIER" (FIRE ALARM).
3. COORDINATE AND VERIFY WITH DEVICES MANUFACTURER FOR JUNCTION BOX SIZE REQUIRED FOR FUTURE INSTALLATION.
4. MOUNTING HEIGHT SHALL COMPLY WITH ADA REQUIREMENTS AND AS NOTED ON PLAN.
5. CONTRACTOR SHALL VERIFY THE ACTUAL CONDUIT ROUTING AND THE ACTUAL POINT OF INTERCEPTION IN THE FIELD.
6. COORDINATE AND VERIFY EXACT LOCATION AND MOUNTING HEIGHT OF JUNCTION BOXES.
7. COORDINATE AND VERIFY WITH DEVICES MANUFACTURER FOR JUNCTION BOX SIZE REQUIRED FOR FUTURE INSTALLATION.
8. REFER TO NFPA 72 FOR MOUNTING HEIGHT, LOCATION AND SPACING OF FIRE ALARM DEVICES. CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE SMOKE DETECTORS, ATTIC HEAT DETECTOR, FIRE ALARM HORN/STROBE AND FIRE ALARM EXETRIOR HORN TO COMPLY WITH NFPA 72 FOR COVERAGE.
9. REFER TO DRAWING E0.1 FOR GENERAL NOTES.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING AND VERIFYING, THE EXACT LOCATION OF THE "COMMUNICATIONS" PULLBOX FOR THE PROPER INTERFACE WITH THE UNDERGROUND CONDUIT STUB-UPS.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE WORK ASSOCIATED WITH THE EXPANSION OF THE FIRE ALARM SYSTEM AND THE INTERCOM SYSTEM WITH THE PARTICULAR SYSTEMS MANUFACTURERS REPRESENTATIVE AND PROVIDED REQUIRED SYSTEM HARDWARE AND SOFTWARE FOR A FULLY OPERABLE SYSTEM EXPANSION.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING THE LIGHT SENSOR MANUFACTURER REPRESENTATIVE PRIOR TO ROUGH-IN AND COORDINATE THE EXACT LOCATION OF THE LIGHT SENSORS TO PROVIDE PROPER AREA COVERAGE.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL CEILING MOUNTED DEVICES WITH THE ARCHITECTURAL REFLECTED CEILING PLAN AND MAKING REQUIRED ADJUSTMENTS TO AVOID INTERFERENCE WITH THE LIGHTING FIXTURES AND CEILING GRIDS.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL EXHAUST FANS AND PROVIDING A 20A, SPST COIL RELAY CONTROLLED BY LIGHT SWITCH.
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING POWER PACK FOR OCCUPANCY SENSOR IF REQUIRED FOR COMPLETE AND OPERABLE SYSTEM.
16. PROVIDE ALL NECESSARY HARDWARE AS REQUIRED.

REFERENCE NOTES

1. UNLESS OTHERWISE NOTED, DISCONNECT AND REMOVE ALL EXISTING LIGHTING, POWER RECEPTACLES, LOW VOLTAGE, FIRE ALARM AND ALL ELECTRICAL SYSTEMS WHERE CEILING AND WALL BEING DEMOLISHED OR REMOVED. TYPICAL.
2. RE-CONNECT CIRCUIT TO EXISTING CIRCUIT WITHIN THE ROOM. VERIFY EXACT LOCATION AND CIRCUIT IN FIELD. TYPICAL.
3. PROVIDE CONSTANT HOT WIRE ON ALL EMERGENCY LIGHT FIXTURES. TYPICAL.
4. INSTALL CEILING MOUNTED DUAL TECHNOLOGY SENSOR BY NX CONTROL #NXSMDT-OMNI SERIES COMPLETE WITH ROOM CONTROLLER #NXRCFX2-2RD-UNV. TYPICAL.
5. INSTALL WALL SWITCH BY NX CONTROL #NXSW2-4-WH TO ROOM CONTROLLER COMPLETE WITH CABLES PER MANUFACTURER'S REQUIREMENTS. COORDINATE WITH OWNER FOR PROGRAMMING. TYPICAL.
6. INSTALL WALL MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR BY NX CONTROL #NXSMDT-LH1-WH. VERIFY EXACT LCATION IN FIELD. TYPICAL.
7. RE-CONNECT FIRE ALARM DEVICES TO CLOSEST EXISTING FIRE ALAM DEVICES AND RE-PROGRAM FOR COMPLETE AND OPERABLE SYSTEM. VERIFY EXACT LOCATION IN FIELD.
8. INSTALL 1"C-2#10 & 1#10 GND (POWER) AND 1"C-2#10 & 1#10 GND (LIGHTING) TO EXISTING PANEL. PROVIDE NEW 20A/1P CIRCUIT BREAKER IN EXISTING PANEL AS REQUIRED FOR EACH CIRCUIT. INSTALL NEW 12"x12"x6" DEEP (NEMA 3R) WALL MOUNTED "POWER" PULL BOX OR CONDULET AS REQUIRED ON EXISTING BUILDING TO TRANSISTION FROM UNDERGROUND CONDUIT TO ENTER THE BUILDING. VERIFY EXACT ROUTING AND LOCATION IN FIELD.
9. INSTALL NEW 20A HEAVY-DUTY, WEATHER-RESISTANT, GFI RECEPTACLE IN LOCKABLE WEATHERPROOF COVER OR ENCLOUSRE. VERIFY EXACT LOCATION IN FIELD.
10. INSTALL NEW EXTERIOR LIGHTING MOUNTED ON SHADE STUCTURE BEAM. ROUTE CIRCUIT THROUGH EXISTING LIGHTING CONTROL FOR EXTERIOR LIGHTING OR INSTALL NEW ASTRONOMICAL DIGITAL LIGHTING CONTROL TO MATCH EXISTING. VERIFY EXACT LOCATION IN FIELD.

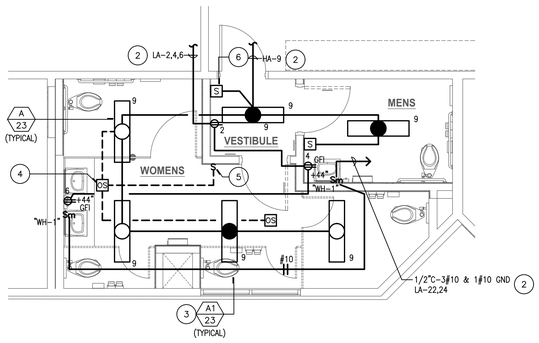
FIXTURE SCHEDULE

TYPE	DESCRIPTION	MANUFACTURER
A 23	RECESSED MOUNTED 1'X4' LED LIGHT FIXTURE WITH ACRYLIC LENS AND 0-10V DIMMING DRIVER.	COLUMBIA #CBT14-B-LSCS-EDD OR APPROVED EQUAL TO LITHONIA OR METALUX
A1 23	RECESSED MOUNTED 1'X4' LED LIGHT FIXTURE WITH ACRYLIC LENS AND 0-10V DIMMING DRIVER. (WITH 90-MINUTE EMERGENCY BATTERY PACK).	COLUMBIA #CBT14-B-LSCS-EDD-ELL14 OR APPROVED EQUAL TO LITHONIA OR METALUX
XB 25	4' LINEAR LED EXTERIOR LIGHTING FIXTURE WITH POLYCARBONATE LENS AND BUILT-IN OCC. SENSOR (WET LOCATION)	NEW START LIGHTING #VIC4N-L140-80C-1C-RC-xx-UN-OC OR APPROVED EQUAL TO KENALL OR LUMINAIRE



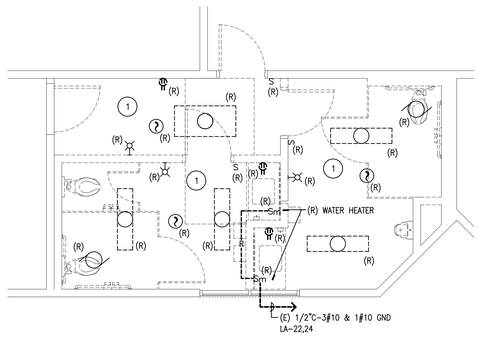
5 FIRE ALARM FLOOR PLAN

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



4 LIGHTING AND POWER FLOOR PLAN

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



3 ELECTRICAL DEMOLITION FLOOR PLAN

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

CONDUIT AND WIRE SPECIFICATIONS

LABEL	DESCRIPTION OF CONTENTS	CONDUIT SIZE (UNO)
F1	(1)-16/2	3/4" MIN.
F2	(1)-12/2 CU	3/4" MIN.
F3	(1)-14/2 SHIELDED SPKR. CABLE	3/4" MIN.
F4	(2) F1	3/4" MIN.
F5	(2) F2	3/4" MIN.
F6	(2) F3	3/4" MIN.
F7	(1) F1 & (1) F2	3/4" MIN.
F8	(1) F1 & (1) F3	3/4" MIN.
F9	(1) F2 & (1) F3	3/4" MIN.
F10	(1) F1 & (1) F2 & (1) F3	1" MIN.

NOTES:
1. 16/2 = WEST PENN WIRE #C0990 & #C0991, INSIDE ONLY.
2. 16/2 = WEST PENN WIRE #A0220, UNDERGROUND.
3. CONDUIT NOT TO EXCEED 40% FILL PER CEC STANDARDS.
4. ALL WIRING TO BE LISTED FOR USE AS REQUIRED BY TITLE 24/CEC. ART. 760.
5. "THHN-2", "AQUASEAL", OR EQUAL TO BE USED IN WET LOCATIONS.

IDENTIFICATION STAMP
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APP: 04-125584 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 09/01/2026

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drawing title:
FIRE ALARM, LIGHTING AND POWER FLOOR PLANS

drawing no.:
E2-1

SCOPE OF WORK

INSTALL A COMPLETE FIRE ALARM ADDRESSABLE SYSTEM PER 2025 NFPA 72.. AREA SMOKE DETECTION SHALL BE USED AND AC UNITS SHALL BE SHUT DOWN THROUGH FIRE ALARM SYSTEM. FIRE ALARM PANEL SHALL BE MONITORED BY UL CERTIFIED CENTRAL STATION.

NOTE:
PROVIDE DEDICATED 120 VOLT CIRCUIT CONNECTED TO LOCKED–ON BREAKER. THE CIRCUIT BREAKER SHALL BE LOCKED–ON WITH APPROVED LOCKING DEVICE, MARKED RED AND IDENTIFIED AS "FIRE ALARM CONTROL CIRCUIT". VERIFY PANEL AND SPARE CIRCUIT WITH MODULAR BUILDING MANUFACTURER.

COMPLETE PLAN SUBMITTAL FOR FULLY AUTOMATIC FIRE ALARM SYSTEM PER DSA PLAN SUBMITTAL REQUIREMENTS – FIRE ALARM DETECTION

FIRE ALARM RECORD DOCUMENT CABINET 2025 NFPA 72, 7.7.2.5

- EVERY NEW FIRE ALARM SYSTEM SHALL PROVIDE A DOCUMENTATION CABINET, INSTALLED AT THE SYSTEM CONTROL PANEL OR OTHER APPROVED LOCATION.
- THE DOCUMENTATION CABINET SHALL BE PROMINENTLY LABELED, "SYSTEM RECORD DOCUMENTS".
- ALL RECORD AND TESTING DOCUMENTATION SHALL BE STORED IN THE CABINET.
- CONTENTS SHALL BE ACCESSIBLE BY AUTHORIZED PERSONNEL ONLY.
- WHERE CABINET IS INSTALLED IN A LOCATION OTHER THAN THE SYSTEM CONTROL UNIT, ITS LOCATION SHALL BE IDENTIFIED AT THE SYSTEM CONTROL UNIT.

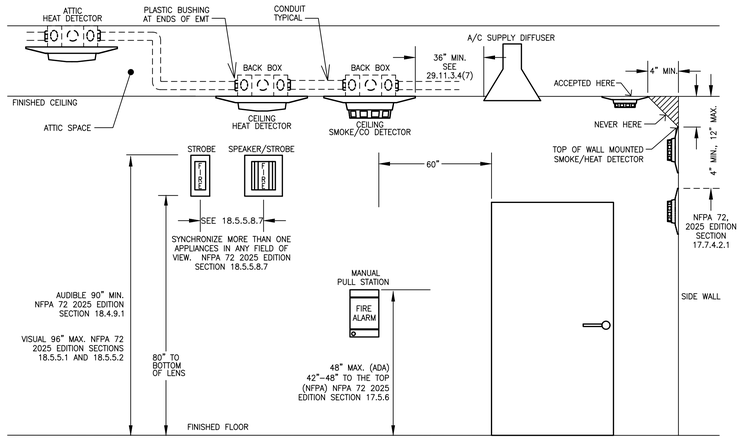
SYSTEM DOCUMENTS AS APPLICABLE:

- RECORD DRAWINGS/AS–BUILTS.
- EQUIPMENT CUT SHEETS & CA SFM LISTINGS.
- ALTERNATIVE MEANS AND METHODS.
- PERFORMANCE BASED DESIGN DOCUMENTATION (NFPA 72, 7.3.7)
- SYSTEM RECORD OF COMPLETION & ANY SUPPLEMENTAL INSPECTION AND TESTING DOCUMENTATION (NFPA 72, 7.8.2)
- EMERGENCY RESPONSE PLAN (NFPA 72, 7.3.8)
- EVALUATION DOCUMENTATION (NFPA 72, 7.3.9)
- RISK ANALYSIS DOCUMENTATION (NFPA 72, 7.3.6)
- SOFTWARE & FIRMWARE CONTROL DOCUMENTATION (NFPA 72, 23.2.2)

SEQUENCE OF OPERATION

ACTION	DEVICE	120 VOLT POWER FAILURE	SYSTEM TROUBLE/ WIRING FAULT or OPEN	AREA SMOKE/CO DETECTOR	AREA air ATTIC HEAT DETECTOR
SOUND CONTROL PANEL TROUBLE BUZZER		YES	YES	NO	NO
SOUND CONTROL PANEL SUPERVISORY BUZZER		NO	NO	NO	NO
SOUND CONTROL PANEL ALARM BUZZER		NO	NO	YES	YES
ACTIVATE RELAY FOR CENTRAL STATION MONITORING		YES	YES	YES	YES
ANNUNCIATE AT REMOTE ANNUNCIATOR PANEL (ALARM or TROUBLE)		YES	YES	YES	YES
[1] ACTIVATE NOTIFICATION (AUDIBLE/VISUAL) ALARM SIGNAL THROUGHOUT BLDG		NO	NO	YES	YES
NOTIFY FIRE DEPARTMENT VIA MONITORING STATION "		NO	NO	YES	YES
SHUTDOWN AUTONOMOUS PUBLIC ADDRESS SYSTEM UPON ACTIVATION OF SYSTEM		NO	NO	YES	YES

[1] PRE–RECORDED FIRE ALARM VOICE EVACUATION SIGNAL SHALL BE A FEMALE VOICE, AND SOUND "MAY I HAVE YOUR ATTENTION PLEASE MAY I HAVE YOUR ATTENTION PLEASE, A FIRE HAS BEEN REPORTED IN THE BUILDING. PLEASE PROCEED TO THE NEAREST EXIT AND EXIT THE BUILDING.". MESSAGE SHALL REPEAT UNTIL MANUALLY DISABLED/SILENCED AT CONTROL OR ANNUNCIATOR PANEL.



FIRE ALARM ELEVATION DETAIL (NTS)

F.A. COMPONENT LISTING(S)

SYMBOL	DESCRIPTION	C.S.F.M.
FACP	FIRE ALARM CONTROL PANEL (EXISTING) (NOTIFIER #NFS2–640)	7165–0028:0243
135cd 90cd 110cd	VISUAL HORN AND STROBE (SYSTEM SENSOR #SPSRLED)	7135–1653:0532
WP S	FIRE ALARM EXTERIOR SPEAKER (WEATHERPROOF) (SYSTEM SENSOR #SPSRKL)	7125–1653:0538
	ADDRESSABLE SMOKE DETECTOR, CEILING MOUNTED. (PHOTO–ELECTRIC) (NOTIFIER #FSP–951–SELFT; WITH #B300–6 BASE)	7275–0028:0503 7300–1653:0109
?	HEAT DETECTOR, ATTIC MOUNTED. (NOTIFIER #FST–951H; WITH #B300–6 BASE)	7270–0028:0502 7300–1653:0109
	16/2 STRANDED BARE COPPER CONDUCTORS, OVERALL UNSHIELDED WITH AQUASEAL AND OVERALL JACKET WEST PENN #AQ225	7161–0859:0101
	16/2 SOLID BARE COPPER CONDUCTORS, UNSHIELDED AND OVERALL JACKET WEST PENN #0990/BELDEN #5220UL	7161–0859:0101
	16/2 SOLID BARE COPPER CONDUCTORS, SHIELDED AND OVERALL JACKET WEST PENN #0991/BELDEN #5220FL	7161–0859:0101
	12/2 COPPER FPLP WEST PENN #998S	7161–0859:0101

PARTIAL LIST OF APPLICABLE CODES (AS OF JANUARY 1, 2023) :

2025 CALIFORNIA ADMINISTRATIVE CODE, PART 1, TITLE 24 C.C.R.
2025 CALIFORNIA BUILDING CODE (CBC), PART 2, TITLE 24 C.C.R.
2025 CALIFORNIA ELECTRICAL CODE (CEC), PART 3, TITLE 24 C.C.R.
2025 CALIFORNIA MECHANICAL CODE (CMC) PART 4, TITLE 24 C.C.R.
2025 CALIFORNIA PLUMBING CODE (CPC), PART 5 TITLE 24 C.C.R.
2025 CALIFORNIA ENERGY CODE (CEC), PART 6, TITLE 24 C.C.R.
2025 CALIFORNIA WILDLAND–URBAN INTERFACE CODE (CWUIC), PART 7, TITLE 25 C.C.R.
2025 CALIFORNIA FIRE CODE (CFC), PART 9, TITLE 24 C.C.R.
2025 CALIFORNIA GREEN BUILDING STANDARDS CODE (CALGREEN), PART 11, TITLE 24 C.C.R.
2025 CALIFORNIA REFERENCED STANDARDS, PART 12, TITLE 24 C.C.R.
TITLE 19 C.C.R., PUBLIC SAFETY, STATE FIRE MARSHAL REGULATIONS.

PARTIAL LIST OF APPLICABLE STANDARDS:

NFPA 72	NATIONAL FIRE ALARM AND SIGNALING CODE	2025 EDITION
NFPA 92	STANDARD FOR SMOKE CONTROL SYSTEMS	2024 EDITION
UL 464	AUDIBLE SIGNAL APPLIANCES	2023 EDITION

REFERENCE CODE SECTION FOR NFPA STANDARDS–2025 CBC (SFM) CHAPTER 35. SEE CHAPTER 35 FOR STATE OF CALIFORNIA AMENDMENTS TO NFPA STANDARDS.

COMPLETE PLAN SUBMITTAL FOR FULLY AUTOMATIC FIRE ALARM SYSTEM PER DSA PLAN SUBMITTAL REQUIREMENTS – FIRE ALARM DETECTION

CONDUIT AND WIRE SPECIFICATIONS

LABEL	DESCRIPTION OF CONTENTS	CONDUIT SIZE (UNO)
F1	(1)–16/2	3/4" MIN.
F2	(1)–12/2 CU	3/4" MIN.
F3	(1)–14/2 SHIELDED SPKR. CABLE	3/4" MIN.
F4	(2) F1	3/4" MIN.
F5	(2) F2	3/4" MIN.
F6	(2) F3	3/4" MIN.
F7	(1) F1 & (1) F2	3/4" MIN.
F8	(1) F1 & (1) F3	3/4" MIN.
F9	(1) F2 & (1) F3	3/4" MIN.
F10	(1) F1 & (1) F2 & (1) F3	1" MIN.

NOTES:
1. 16/2 = WEST PENN WIRE #0990 & #0991; INSIDE ONLY.
2. 16/2 = WEST PENN WIRE #AQ225; UNDERGROUND.
3. CONDUIT NOT TO EXCEED 40% FILL PER CEC STANDARDS.
3. ALL WIRING TO BE LISTED FOR USE AS REQUIRED BY TITLE 24/CEC. ART. 760.
4. "THHN–2", "AQUASEAL", OR EQUAL TO BE USED IN WET LOCATIONS.

A SYSTEM EMPLOYING A DACT SHALL EMPLOY A SINGLE TELEPHONE LINE (NUMBER) AND ONE OF THE FOLLOWING TRANSMISSION MEANS:
(1) ONE–WAY PRIVATE RADIO ALARM SYSTEM
(2) TWO–WAY RF MULTIPLEX SYSTEM
(3) TRANSMISSION MEANS COMPLYING WITH 26.6.3
(4) A SECOND TELEPHONE LINE (NUMBER) WHERE ALL OF THE FOLLOWING ARE MET:
  (A) ACCESS TO ONE OF THE TECHNOLOGIES IN 26.6.4.2.4.1(1), 26.6.4.2.4.1(2), OR 26.6.4.2.4.1(3)
  (B) THE AUTHORITY HAVING JURISDICTION APPROVES THE ARRANGEMENT.
  (C) THE DACT IS PROGRAMMED TO CALL A SECOND DACR LINE (NUMBER) WHEN THE SIGNAL TRANSMISSION SEQUENCE TO THE FIRST CALLED LINE (NUMBER) IS UNSUCCESSFUL.
  (D) THE DACT IS CAPABLE OF SELECTING THE OPERABLE MEANS OF TRANSMISSION IN THE EVENT OF FAILURE OF THE OTHER MEANS.
  (E) EACH TELEPHONE LINE IS TESTED IN ACCORDANCE WITH 26.6.4.2.4.2 OR ALTERATING 6–HOUR INTERVALS. 2022 NFPA 72 SECTION 26.6.4.2.4.1.

FIRE ALARM NOTES

1. APPLICABLE STANDARD 2025 NFPA 72
2. INSTALLATION OF THE SYSTEMS SHALL NOT BE STARTED UNTIL DETAILED DESIGN DOCUMENTS AND SPECIFICATION, INCLUDING STATE FIRE MARSHALL LISTING NUMBERS FOR EACH COMPONENT OF THE SYSTEM HAS BEEN APPROVED BY DSA.
3. UPON COMPLETION OF THE INSTALLATION OF THE SYSTEMS, A SATISFACTORY TEST OF THE ENTIRE SYSTEM SHALL BE MADE IN THE PRESENCE OF A DSA PROJECT INSPECTOR.
4. A STAMPED SET OF APPROVED FIRE ALARM DESIGN DOCUMENTS SHALL BE ON THE JOB SITE AND USED FOR INSTALLATION.
5. ANY DISCREPANCIES BETWEEN THE DRAWINGS AND THE CODE OR RECOGNIZED STANDARDS SHALL BE BROUGHT TO THE ATTENTION OF DSA AND THE ARCHITECT/ENGINEER OF THE PROJECT.
6. DSA, ARCHITECT/ENGINEER AND OWNER SHALL BE NOTIFIED A MINIMUM OF 48 HOURS PRIOR TO THE FINAL INSPEECTION AND/OR TESTING.
7. WALL MOUNTED VISUAL NOTIFICATION DEVICES SHALL HAVE THEIR BOTTOMS MOUNTED AT 80" MINIMUM AND 96" MAXIMUM FROM FINISHED FLOOR.
8. WALL MOUNTED AUDIBLE NOTIFICATION DEVICES SHALL HAVE THEIR TOPS MOUNTED AT 90" FROM FINISHED FLOOR AND NO CLOSER THAN 6" TO A HORIZONTAL STRUCTURE.
9. AUDIBLE DEVICES TO BE AT LEAST 15 DBA ABOVE THE AVERAGE AMBIENT SOUND LEVEL BUT NOT LESS THAN 75 DBA AT 10 FEET OR MORE THAN 110 DBA AT THE MINIMUM HEARING DISTANCE. SOUND LEVEL SHALL BE MAINTAINED FOR DURATION OF AT LEAST 60 SECONDS 5 DBA MUST BE MAINTAINED.
10. AUDIBLE DEVICES SHALL BE SYNCHRONIZED TEMPORAL CODE 3 PATTERN.
11. THE CONTRACTOR SHALL ADJUST/INSTALL ALL DEVICES TO MAXIMIZE PERFORMANCE AND TO MINIMIZE FALSE ALARMS.
12. VISUAL DEVICES 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. VISUAL DEVICES WITHIN THE SAME ROOM SHALL BE SYNCHRONIZED.
13. UNDERGROUND AND EXTERIOR CONDUITS TO HAVE WATERTIGHT FITTINGS AND WIRE TO BE APPROVED FOR WET LOCATION.
14. ALL FIRE ALARM WIRING SHALL BE FLP OR FPLP (FIRE POWER LIMITED OR FIRE POWER LIMITED PLENUM) AS REQUIRED FOR APPLICATION. WIRING IN CONDUIT ABOVE GROUND MAY BE THHN OR THWN.
15. PER CEC STANDARDS, ALL WIRING IS TO BE PULLED THROUGH EACH JUNCTION BOX AND CONNECTED DIRECTLY TO EACH FIRE DEVICE. DO NOT SPLICE THE WIRE. THERE MUST BE AT LEAST 6 FEET OF LEAD WIRE FROM THE BOX TO THE DEVICE. ALL BOXES TO BE SIZED PER CEC.
16. SMOKE DETECTORS SHALL NOT BE ANY CLOSER THAN 1 FEET FROM FIRE SPRINKLERS OR 3 FEET FROM ANY SUPPLY DIFFUSER. IN AREA OF CONSTRUCTION OR POSSIBLE DAMAGE/CONTAMINATION ON NEWLY INSTALLED FIRE ALARM DEVICES SHALL BE COVERED UNTIL THAT AREA IS READY TO BE TURNED OVER TO THE OWNER.
17. ALL FIRE ALARM CIRCUITS SHALL BE IN CONDUIT, SURFACE RACEWAY OR OPEN RUN ABOVE CEILINGS, UNDER FLOORS AND IN WALLS IN A NEAT AND PROTECTED MANNER AS INDICATED ON DESIGN DOCUMENTS. EXPOSED CIRCUITS ARE ONLY PERMITTED WHEN NOTED AS EXPOSED ON DESIGN DOCUMENTS.
18. FIRE ALARM PANEL, REMOTES, AND COMPONENTS SHALL BE SECURED TO MOUNTING SURFACES PER MANUFACTURER'S SPECIFICATION. NO SINGLE DEVICE SHALL EXCEED THE WEIGHT OF 20 LBS. WITHOUT SPECIAL MOUNTING DETAILS.
19. A DEDICATED BRANCH CIRCUIT SHALL BE PROVIDED FOR FIRE ALARM EQUIPMENT. THIS CIRCUIT SHALL BE ENERGIZED FROM THE COMMON USE AREA PANEL AND SHALL HAVE NO OTHER OUTLETS. THE BREAKER SHALL HAVE A RED LOCKING DEVICE TO BLOCK THE HANDLE IN THE "ON" POSITION. THE CIRCUIT BREAKER SHALL BE LABELED "FIRE ALARM CIRCUIT CONTROL". CIRCUIT ID TO BE LABELED AT FIRE PANEL/EXTENDERS.
20. THE INSTALLING CONTRACTOR SHALL PROVIDE A RECORD OF COMPLETION PER NFPA 72, SECTION 7.5.6.
21. CONTROL PANELS, REMOTE ANNUNCIATOR SHALL BE INSTALLED WITH THEIR BOTTOMS MOUNTED AT 48".
22. THE INSTALLING CONTRACTOR SHALL PROVIDE SYSTEM PROGRAMMING FOR SUPERVISORY MONITORING PER CBC SECTION 901.6.2.
23. SUPERVISORY MONITORING SHALL BE TESTED AND VERIFIED AS SENDING CORRECT SIGNALS IN CONJUNCTION WITH FINAL ACCEPTANCE TEST.
24. OWNER SHALL BE RESPONSIBLE FOR ESTABLISHING A FIRE SYSTEM MONITORING CONTRACT OR PROVISIONS.
25. THE PERSON RESPONSIBLE FOR THE FIRE ALARM SYSTEM DESIGN LAYOUT ARE AS FOLLOWS:

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COMPANY: YOWANTO ENGINEERING, INC.
ADDRESS: 2705 TOWNE AVE., #C
POMONA, CA 91767
EMAIL: IYOWANTO@YOWANTOENG.COM
FIRE ALARM PATHWAY: CLASS B
SURVIVABILITY: LEVEL 1

26. MINIMUM NOTIFICATION APPLIANCE AUDIBILITY REQUIRED: EDUCATIONAL = 60DBA MINIMUM. (CBC 907.5.2.1.1, NFPA 72, 18.4.3.1).

NOTES

1. REFER TO THE FIRE ALARM SYSTEM SPECIFICATION, FOR ADDITIONAL REQUIREMENTS.
2. REFER TO GENERAL NOTES E0.1 FOR ANY ADDITIONAL REQUIREMENTS.
3. REFERENCE FIRE ALARM RISER DIAGRAM, THIS SHEET, FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
4. FIRE ALARM CONDUIT SHALL BE 3/4", UNLESS OTHERWISE NOTED.
5. FIRE ALARM CONDUCTORS SHALL BE KEPT SEPARATE FROM ALL OTHER SYSTEMS. CONTRACTOR SHALL PROVIDE PERMANENT STEEL BARRIERS IN ALL JUNCTION BOXES, PULL BOXES, TERMINAL CABINETS, ETC. TO MAINTAIN SEPARATION.
6. THE FIRE ALARM SYSTEM SHALL CONFORM TO CFC 907.2.3 AND ARTICLE 760 OF CALIFORNIA ELECTRICAL CODE. INSTALLATION OF THE FIRE ALARM SYSTEM SHALL NOT BE STARTED UNTIL DETAILED PLANS AND SPECIFICATIONS, INCLUDING CALIFORNIA STATE FIRE MARSHAL LISTING NUMBERS FOR EACH COMPONENT OF THE SYSTEM HAVE BEEN APPROVED BY DSA. CFC 901, UPON COMPLETION OF THE INSTALLATION OF THE FIRE ALARM SYSTEM A SATISFACTORY TEST OF THE ENTIRE SYSTEM SHALL BE MADE IN THE PRESENCE OF THE FIRE AUTHORITY HAVING JURISDICTION.
7. THE ALARM SYSTEM SHALL ACTIVATE A MEANS OF WARNING THE HEARING IMPAIRED. FLASHING VISUAL WARNINGS SHALL HAVE A FREQUENCY OF NOT LESS THEN 2 FLASHES PER SECOND AND SHALL NOT BE SLOWER THAN 1 FLASH EVERY SECOND. (NFPA 72 SECTION 18.5.2.1) SIGNALING DEVICES FOR THE HEARING IMPAIRED SHALL BE STATE FIRE MARSHAL APPROVED AND LISTED.
8. INSULATED CONDUCTORS USED IN WET LOCATIONS SHALL BE (1) MOISTURE–IMPERVIOUS METAL SHEATHED (2) TYPES RHW, TW, THW, THHN, XHHW OR (3) OF A TYPE LISTED FOR USE IN WET LOCATIONS. CABLES OF ONE OR MORE CONDUCTORS USED IN WET LOCATIONS SHALL BE OF A TYPE LISTED FOR USE IN WET LOCATIONS. CONDUCTORS USED FOR DIRECT BURIAL APPLICATIONS SHALL BE OF A TYPE LISTED FOR SUCH USE (SEC. 310.7 AND 310.8 CEC).
9. UNDERGROUND AND EXTERIOR CONDUITS WILL HAVE WATERTIGHT FITTINGS PER (CEC 110–11, 300–6 AND 346–5).
10. PER CFC 901.2.1 STATEMENT OF COMPLIANCE SHALL BE COMPLETED BEFORE INSPECTION REQUEST. UPON COMPLETION OF THE INSTALLATION OF THE FIRE ALARM SYSTEM THE LOCAL AUTHORITY SHALL WITNESS FINAL FIRE ALARM TEST PER NFPA 72 PRIOR TO OCCUPANCY. A COMPLETED FIRE ALARM DESCRIPTION & CERTIFICATION REPORT SHALL BE PROVIDED AND INCLUDED WITH AS–BUILT DWGS PER CFC 907.18 THRU 907.20.5
11. WIRING MUST BE LISTED FOR USE AS REQUIRED BY CFC 907.1.2 CEC, ARTICLE 760
12. CONTRACTOR SHALL PROVIDE NO LESS THAN 8 HOURS OF IN–SERVICE TO OWNER.
13. IT IS UP TO THE CONTRACTOR TO FULLY FAMILIARIZE THEMSELVES WITH THE SITE AND ITS CONDITIONS PRIOR TO BIDDING.
14. EQUIPMENT AND DEVICE MODEL NUMBERS ARE A PART OF THE DSA APPROVAL. ALL SUBSTITUTIONS ARE SUBJECT TO PRIOR TO APPROVAL BY THE ARCHITECT. ADDITIONALLY THE CONTRACTOR IS RESPONSIBLE FOR SECURING DSA APPROVAL OF ALL CHANGES. NO ADDITIONAL COST OR TIME EXTENSIONS WILL BE GRANTED. DSA APPROVAL MUST BE SECURED PRIOR TO INSTALLING ANY WORK.
15. ANY CHANGES IN THE FIRE ALARM SYSTEM INCLUDING ADDITIONS, DELETIONS, MODIFICATIONS, OR REPAIRS SHALL REQUIRED SYSTEM TESTING PER NFPA 72 10–2.2.
16. CONTRACTOR SHALL PROVIDE FIRE ALARM SYSTEM TO MATCH AND COMPATIBLE WITH EXISTING SYSTEM. PROVIDE AS–BUILT DRAWING AT THE END OF THE PROJECT.
17. UNLESS SPECIFICALLY SHOWN ON THESE PLANS NO STRUCTURAL MEMBERS SHALL BE CUT, DRILLED NOR NOTCHED WITHOUT PRIOR WRITTEN AUTHORIZATION FROM THE STRUCTURAL ENGINEER AND THE DISTRICT STRUCTURAL ENGINEER FROM THE DIVISION OF STATE ARCHITECTS.
18. FIRE ALARM SYSTEMS SHALL BE SUPERVISED BY AN APPROVED UL LISTED CENTRAL STATION, OR REMOTE STATION (UUFX) MONITORING COMPANY (UUJS). CFC 907.6.6.

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IBP project number: 24006.00
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drawn by: IY checked by: IY
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drawing title:
FIRE ALARM CSFM LISTING, NOTES & DETAILS

drawing no.:
E3-1

FIXTURE SCHEDULE

ITEM	FIXTURE	ROUGH-IN CONNECTIONS: TRAP	WASTE	VENT	HOT WATER	COLD WATER	GAS	DESCRIPTION
WC 1	WATER CLOSET	INT	4"	2"	--	1"	--	AMERICAN STANDARD (A/S) NO. 3451.001 "MADERA FLOWISE 15" HEIGHT ELONGATED FLUSH VALVE TOILET", SIPHON JET, FLOOR MOUNTED, ELONGATED BOWL, 15" HIGH. COMPLETE WITH SLOAN ROYAL NO. 111-1.28 GPF FLUSH VALVE, OLSONITE NO. 95SSCT SEAT AND A/S BOLT CAPS.
WC 2	WATER CLOSET (ACCESSIBLE)	INT	4"	2"	--	1"	--	AMERICAN STANDARD (A/S) NO. 3461.001 "MADERA FLOWISE 16-1/2" HEIGHT ELONGATED FLUSHOMETER TOILET", SIPHON JET, FLOOR MOUNTED, ELONGATED BOWL, 16-1/2" HIGH. COMPLETE WITH SLOAN ROYAL NO. 111-1.28 GPF FLUSH VALVE, OLSONITE NO. 95SSCT SEAT AND A/S BOLT CAPS.
L 1	LAVATORY (ACCESSIBLE, TW)	1-1/4"	2"	1-1/2"	1/2"TW	--	--	AMERICAN STANDARD (A/S) NO. 0355.012 "LUCERNE WALL HUNG LAVATORY", 20" X 18", WALL HUNG. COMPLETE WITH CHICAGO NO. 3400-E39VPABCP METER FAUCET 0.35 GPM NON-AERATING SPRAY AND VANDAL RESISTANT COVER PLATE, McGUIRE NO. 155A 1-1/4" OUTLET "OPEN GRID P.O. PLUG", McGUIRE NO. PW8090NCO 1-1/4" L.A. PATTERN P-TRAP WITH TRAP AND SUPPLY COVERS, GALVANIZED NIPPLE AND CHROMIUM PLATED BRASS CASING, CHICAGO NO. 1017-ABCP LOOSE KEY STOPS WITH RIGID SUPPLIES, AND ZURN NO. Z-1231-EZR-WL ADJUSTABLE CONCEALED ARM CARRIER W/ SLEEVE FOR WASTE. MOUNT IN ACCORDANCE WITH ADA REQUIREMENTS.
L 2	LAVATORY (ACCESSIBLE, SELF RIMMING, HW/CW)	1-1/4"	2"	1-1/2"	1/2"	1/2"	--	AMERICAN STANDARD (A/S) NO. 0476.028 "AQUALYN COUNTERTOP LAVATORY", 20" X 17", SELF RIMMING, FAUCET LEDGE, VITREOUS CHINA. COMPLETE WITH CHICAGO NO. 3400-e39vpABCP METER FAUCET 0.35 GPM NON-AERATING SPRAY AND VANDAL RESISTANT COVER PLATE, McGUIRE NO. 155A 1-1/4" OUTLET "OPEN GRID P.O. PLUG", McGUIRE NO. PW8090NCO 1-1/4" L.A. PATTERN P-TRAP WITH TRAP AND SUPPLY COVERS, GALVANIZED NIPPLE AND CHROMIUM PLATED BRASS CASING, AND CHICAGO NO. 1017-ABCP LOOSE KEY STOPS WITH RIGID SUPPLIES. MOUNT IN ACCORDANCE WITH ADA REQUIREMENTS.

ITEM	FIXTURE	ROUGH-IN CONNECTIONS: TRAP	WASTE	VENT	HOT WATER	COLD WATER	GAS	DESCRIPTION
TP 1	TRAP PRIMER (SINGLE DRAIN)	--	--	--	--	1/2"	--	MIFAB NO. MR-500 TRAP PRIMER VALVE, BRASS BODY, ADJUSTABLE, COMPLETE WITH 1/2" COPPER TYPE "L" PIPE TO RECEPTOR. INSTALL PER MANUFACTURER'S RECOMMENDATIONS, COMPLETE BEHIND ACCESS PANEL WITH SHUT-OFF VALVE.
WHA 1	WATER HAMMER ARRESTOR	--	--	--	--	--	--	ZURN NO. Z-1700 SERIES "SHOKTROL" WATER HAMMER ARRESTOR COMPLETE BEHIND ACCESS PANEL. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
FD 1	FLOOR DRAIN	2"	2"	1-1/2"	--	--	--	ZURN NO. ZN-415-BZ1-P, CAST IRON BODY, COMPLETE WITH ROUND NICKEL-BRONZE TOP, CLAMPING COLLAR, 1/2" TRAP PRIMER CONNECTION AND P-TRAP.
HB 1	HOSE BIBB (WALL)	--	--	--	--	3/4"	--	ACORN NO. 8121-CP "BENT NOSE WITH FLANGE" HOSE BIBB, WALL MOUNTED, CHROME-PLATED POLISHED, WITH INTEGRAL VACUUM BREAKER, LOOSE KEY OPERATION.
DF 1	DRINKING FOUNTAIN (ACCESSIBLE)	1-1/4"	1-1/4"	1-1/4"	--	3/4"	--	MURDOCK NO. A172.8-UG-BF SERIES, BARRIER FREE. UNIVERSAL BI-LEVEL, WALL MOUNTED WATER COOLER W/SENSOR OPERATED BOTTLE FILLER. 304 STAINLESS STEEL BASIN, 304 STAINLESS STEEL BUBBLER W/SATIN STAINLESS FINISH. ADA APPROVED. MOUNT AT ADA ACCESSIBLE HEIGHT.

ELECTRIC WATER HEATER SCHEDULE

ITEM	MANUFACTURER	MODEL NO.	SERVICE	LOCATION	STORAGE	ELECTRICAL DEMANDS: VOLT	PHASE	KW/AMP	CYCLE	RECOVERY CAPACITY @ 60°F	INLET TEMP °F	OUTLET TEMPER °F	OPER. WT. LBS.	REMARKS
WH 1	CHRONOMITE MICRO	INSTANT-TEMP CMI-20L	DOMESTIC HOT WATER	SEE PLANS	INSTANT-FLOW	208	1	20 A	60	INSTANT	60	104	8 LBS.	MUST HAVE ASHRAE STICKER OR OTHERWISE COMPLY WITH TITLE 24 REQUIREMENT FOR SERVICE WATER HEATERS.
WH 2	CHRONOMITE MICRO	INSTANT-TEMP CMI-20L	DOMESTIC HOT WATER	SEE PLANS	INSTANT-FLOW	277	1	20 A	60	INSTANT	60	104	8 LBS.	

GENERAL NOTES

1. BEFORE COMMENCEMENT OF WORK, THE CONTRACTOR SHALL VERIFY THE EXACT LOCATIONS, ELEVATIONS AND CHARACTERISTICS OF ALL UTILITIES AND PIPING, AND SHALL IMMEDIATELY NOTIFY THE ARCHITECT OF ANY DISCREPANCIES.
2. ALL ACCESSIBLE WATER CLOSETS SHALL HAVE FLUSH VALVE WITH HANDLE ON OPEN SIDE.
3. ALL VALVES, UNIONS, ETC. TO BE SAME SIZE AS PIPE UNLESS OTHERWISE INDICATED ON DRAWINGS.
4. ALL PLUMBING FIXTURE VENTS TO TERMINATE A MINIMUM OF 12 INCHES FROM ANY VERTICAL SURFACE AND 10 FEET FROM ANY OUTSIDE AIR INTAKES.
5. EXACT LOCATIONS AND MOUNTING HEIGHTS OF PLUMBING FIXTURES SHALL BE OBTAINED FROM THE ARCHITECTURAL DRAWINGS.
6. CONNECTION BETWEEN INCOMPATIBLE MATERIALS ABOVE GRADE AND INSIDE BUILDING SHALL BE MADE WITH TWO (2) DIELECTRIC UNIONS SEPARATED BY A TWELVE INCH (12") SECTION OF RED BRASS PIPE.
7. ALL CLEANOUTS SHALL BE INSTALLED WHERE READILY ACCESSIBLE. ALL URNINALS SHALL HAVE CLEANOUTS ABOVE FIXTURE, CPC 707.4. THE CONTRACTOR SHALL COORDINATE ALL CLEANOUT LOCATIONS WITH EQUIPMENT, CABINETS, ETC., AND THE ARCHITECT PRIOR TO ANY INSTALLATION.
8. SEE ARCHITECTURAL DRAWINGS FOR ACCESSIBLE FIXTURE LOCATIONS AND MOUNTING HEIGHTS. INSULATE ALL EXPOSED HOT WATER AND DRAIN PIPING BELOW ACCESSIBLE LAVATORIES AND SINKS.
9. ALL PLUMBING WORK SHALL BE INSTALLED SO AS TO AVOID INTERFERENCE WITH ELECTRICAL AND MECHANICAL EQUIPMENT AND STRUCTURAL FRAMING.
10. ALL WORK AND MATERIAL SHALL BE PERFORMED AND INSTALLED IN COMPLIANCE WITH CALIFORNIA PLUMBING CODE 2025.
11. THESE DRAWINGS INDICATE THE SEWER, WATER, AND STORM DRAIN SYSTEMS TO POINT OF CONNECTION 5'-0" OUTSIDE OF THE BUILDING. CONTINUATION OF THESE SYSTEMS IS SHOWN ON THE CIVIL DRAWINGS AND IS SPECIFIED UNDER ANOTHER SECTION OF THE SPECIFICATIONS. THE PIPING SHALL BE INSTALLED TO MEET THE INVERT ELEVATIONS SHOWN ON THE CIVIL DRAWINGS.
12. INSULATION (SEE SPECIFICATION FOR TYPE REQUIRED) AND COVERING ON PIPE AND TUBING SHALL HAVE A FLAME SPREAD RATING NOT TO EXCEED 25 AND A SMOKE DENSITY NOT TO EXCEED 450 WHEN TESTED IN ACCORDANCE WITH 2025 C.B.C. SECTION 720.3.
13. MATERIALS EXPOSED WITHIN DUCTS OR PLENUMS SHALL HAVE A FLAME-SPREAD INDEX OF NOT MORE THAN 25 AND A SMOKE-DEVELOPED INDEX OF NOT MORE THAN 50 WHERE TESTED IN ACCORDANCE WITH ASTM E84 OR UL 723. CMC 2025, CHAPTERS 7, 9 ,& 11.
14. ANY ALTERATIONS TO A STRUCTURAL MEMBER, SUCH AS CUTTING, BORING, BRAZING, DRILLING, WELDING, ETC. SHALL HAVE PRIOR WRITTEN APPROVAL OF ARCHITECT, STRUCTURAL ENGINEER AND DSA.
15. M.E.P. 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 2025 CBC, SECTIONS 1617A.1.18 THROUGH 1617A.1.26 AND ASCE 7 CHAPTERS 13, 26 AND 30.

    1. ALL PERMANENT EQUIPMENT AND COMPONENTS.
    2. TEMPORARY, MOVABLE OR MOBILE EQUIPMENT THAT IS PERMANENTLY ATTACHED (E.G. HARD WIRE) 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 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 REVERENCES NOTED ABOVE NOR BE DETAILED ON 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 WEIGHING 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 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 THE SUBJECT TO THE APPROVAL OF THE DESIGN PROFESSIONAL IN GENERAL RESPONSIBLE CHARGE OR STRUCTURAL ENGINEER DELEGATED RESPONSIBILITY AND ACCEPTANCE THE DSA. THE PROJECT INSPECTOR WILL VERIFY THAT ALL COMPONENTS AND EQUIPMENT HAVE BEEN ANCHORED IN ACCORDANCE WITH ABOVE REQUIREMENTS.

16. 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 SECTION 13.3 AS DEFINED IN ASCE 7 SECTIONS 13.6.5, 13.6.6, 13.6.7, 13.6.8; AND 2025 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 [X] E [ ] – OPTION 1: PROJECT-SPECIFIC DESIGN

    MP [ ] MD [ ] PP [ ] E [ ] – OPTION 2: DESIGN BASED ON OSHPD OPM, WITHIN PROJECT SUBMITTAL.

    MP [ ] MD [ ] PP [ ] E [ ] – OPTION 3: DESIGN BASED ON OSHPD OPM, DEFERRED SUBMITTAL.

LEGEND

SYMBOL	ABBREVIATION	DESCRIPTION
	S OR W	SOIL OR WASTE BELOW FLOOR OR GRADE
	V	SANITARY VENT
	CW	COLD WATER
	HW	HOT WATER
TP	TP	TRAP PRIMER
TW	TW	TEMPER WATER
ESS	ESS	EXISTING SANITARY SEWER
EV	EV	EXISTING SANITARY VENT
ECW	ECW	EXISTING COLD WATER
EHW	EHW	EXISTING HOT WATER
		DIRECTION OF FLOW
	SOV	SHUT-OFF VALVE
	WCO	WALL CLEANOUT
		RISER UP
		RISER DOWN
	ABV	ABOVE
	AP	ACCESS PANEL
	BEL	BELOW
	CLG	CEILING
	CONT	CONTINUATION
	DN	DOWN
	EXIST	EXISTING
	FLR	FLOOR
	FFE	FINISH FLOOR ELEVATION
	I.E.	INVERT ELEVATION
	POC	POINT OF CONNECTION
	PLCS	PLACES
	VTR	VENT THRU ROOF

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tBP project number: 24006.00

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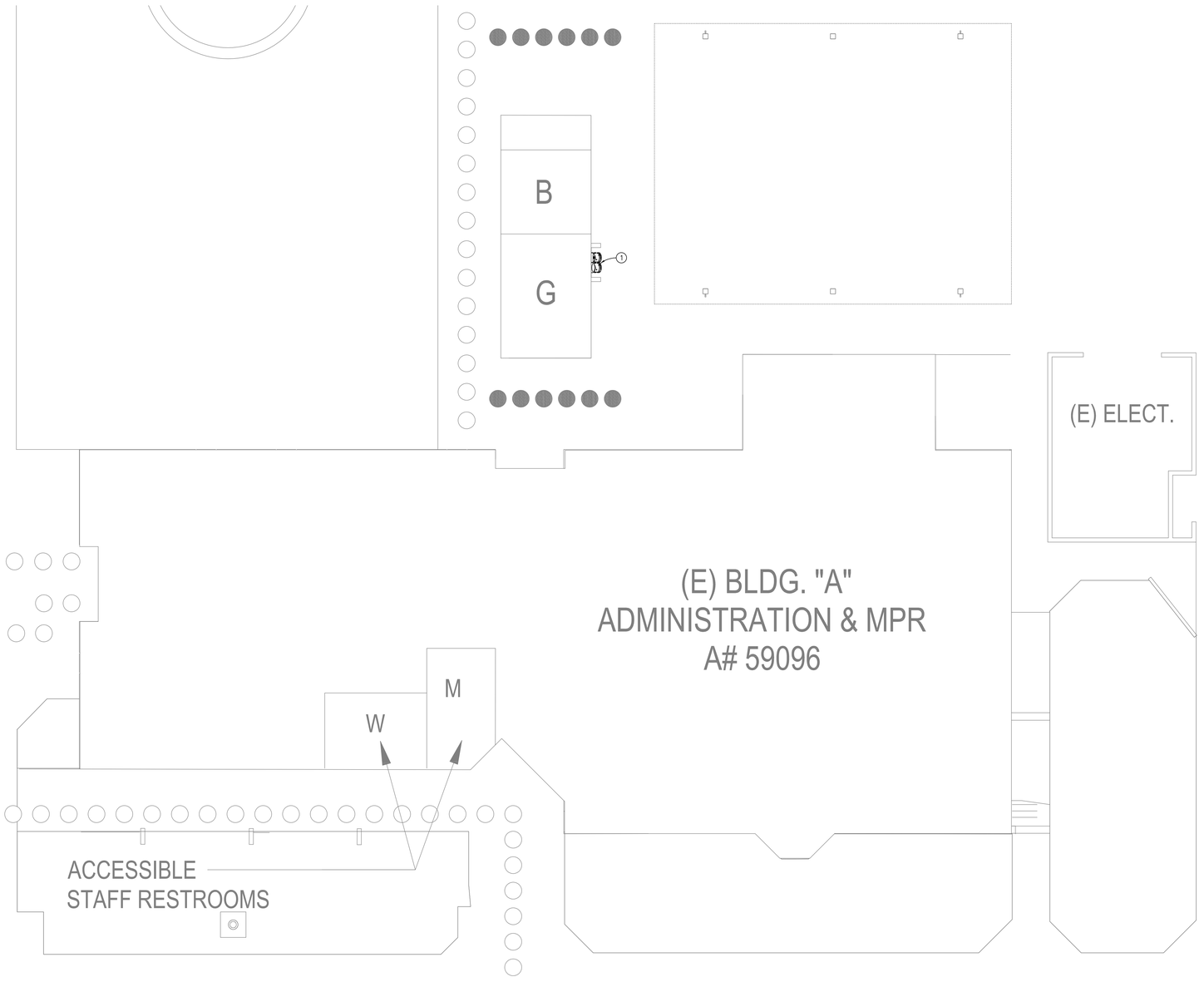
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PLUMBING LEGEND,SCHEDULES AND GENERAL NOTES

drawing no.:
P0-1



DEMOLITION NOTES:

1. OWNER SHALL HAVE FIRST RIGHT OF REFUSAL ON ALL ITEMS INDICATED TO BE REMOVED. CONTRACTOR SHALL VERIFY ALL SUCH ITEMS WITH OWNER PRIOR TO REMOVAL. ALL ITEMS NOT REFUSED BY OWNER SHALL BE REMOVED INTACT AND FULLY FUNCTIONAL BY CONTRACTOR FOR OWNER'S USE. ALL ITEMS REFUSED BY OWNER SHALL BE PROPERLY DISPOSED OF BY CONTRACTOR.
2. REMOVE EXISTING FIXTURES AND EQUIPMENT AS INDICATED. HOT WATER, COLD WATER, VENT AND/OR GAS PIPING SERVING SUCH ITEMS SHALL BE REMOVED TO A SUITABLE CONCEALED LOCATION WITHIN WALL OR ABOVE CEILING AND CAPPED OR PLUGGED UNLESS OTHERWISE NOTED (U.O.N.). WASTE PIPING SERVING SUCH FIXTURES SHALL BE REMOVED TO A SUITABLE CONCEALED LOCATION BELOW FINISHED FLOOR OR BEHIND WALL AND CAPPED OR PLUGGED U.O.N. ASSOCIATED EXISTING DEFUNCT PIPING IN CONCEALED LOCATIONS ABOVE CEILING, WITHIN WALLS, BELOW SLAB, OR BELOW GRADE SHALL BE ABANDONED IN PLACE OR REMOVED AS NECESSARY TO AVOID INTERFERENCE WITH NEW WORK. ASSOCIATED EXISTING DEFUNCT PIPING AND COMPONENTS IN EXPOSED LOCATIONS SHALL BE REMOVED U.O.N. (INCLUDING FLOOR DRAINS, WALL AND FLOOR CLEANOUTS, CLEANOUTS TO GRADE, ACCESS PANELS, SHUT-OFF VALVES AND COCKS, YARD BOXES, MANHOLES, CATCH BASINS, AND OTHER EXPOSED COMPONENTS). EXISTING DEFUNCT ELECTRICAL COMPONENTS SERVING EXISTING TO BE REMOVED EQUIPMENT SHALL BE DEMOLISHED AND REMOVED TO POINT OF ORIGIN.

DEMOLITION KEY NOTES:

(1) EXISTING DRINKING FOUNTAIN TO BE REMOVED BY PLUMBING CONTRACTOR.

NORTH

PLUMBING SITE DEMO PLAN

SCALE 1/8"=1'-0"

1

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file name:

drawn by: checked by:

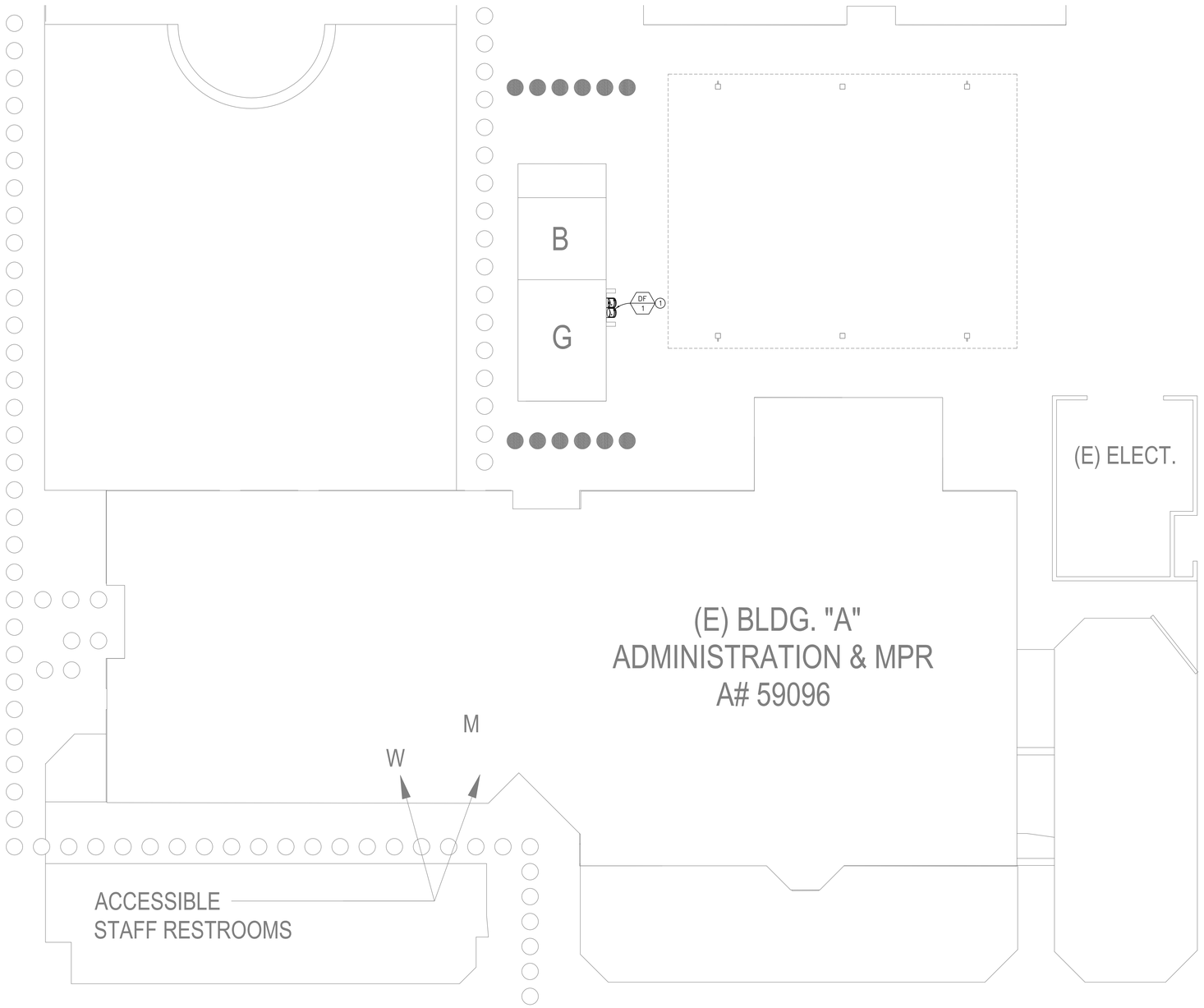
date:

rev:	date:	description:
	07/02/26	DSA SUBMITTAL

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drawing title:
PLUMBING SITE DEMO PLAN

drawing no.:
P1-1



CONSTRUCTION NOTES:

1. BEFORE COMMENCEMENT OF WORK, THE CONTRACTOR SHALL VERIFY THE EXACT LOCATIONS, ELEVATIONS AND CHARACTERISTICS OF ALL UTILITIES AND PIPING BY PHYSICAL EXCAVATION, AND SHALL IMMEDIATELY NOTIFY THE ARCHITECT OF ANY DISCREPANCIES.
2. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING UTILITIES AND POINTS OF CONNECTION PRIOR TO BIDDING PROJECT.
3. WHERE PLANS INDICATE NEW FIXTURES OR EQUIPMENT CONNECTING TO EXISTING SERVICES, PLUMBING CONTRACTOR SHALL MODIFY AND/OR EXTEND EXISTING PIPING OR ROUGH-INS AS REQUIRED TO SUIT THE NEW FIXTURE.

CONSTRUCTION KEY NOTES:

(1) CONTRACTOR SHALL ROUGH-IN AND CONNECT TO EXISTING SERVICES FOR NEW DRINKING FOUNTAIN.

NORTH

PLUMBING SITE PLAN

SCALE 1/8"=1'-0"

1

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 04-125584 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 09/01/2026

DIVISION OF THE STATE ARCHITECT

109 VIA FRONTERA, SUITE 300
SAN DIEGO, CA 92127
ph: 858.674.5400 fx: 858.674.5471

DSA Application Number: 04-125584
DSA File Number: 33-15

agency

tBP
architecture
planning
Interiors

tBP/Architecture
3990 Concours Street, Suite 201
Ontario, CA 91764
ph: 909.635.6386 fx: 949.732.3895

architect

REGISTERED PROFESSIONAL ENGINEER
ANDREW R. GOODMAN
No. 103636
Exp. 3/31/26
MECHANICAL
STATE OF CALIFORNIA

PDS
Pocock Design Solutions Inc.

consultant

WILLIAM COLLIER ELEM SCHOOL
SHADE STRUCTURE ADDITION & PLAYGROUND IMPROVEMENTS

LAKE ELSINORE UNIFIED SCHOOL DISTRICT
20150 MAYHALL DR.
WILDOMAR, CA. 92595

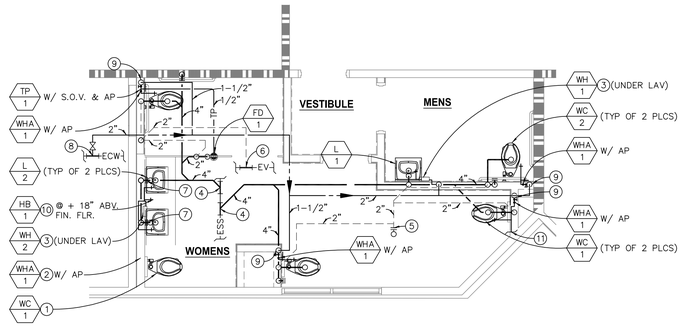
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drawing title:
PLUMBING SITE PLAN

drawing no.:
P1-2



CONSTRUCTION NOTES:

1. BEFORE COMMENCEMENT OF WORK, THE CONTRACTOR SHALL VERIFY THE EXACT LOCATIONS, ELEVATIONS AND CHARACTERISTICS OF ALL UTILITIES AND PIPING BY PHYSICAL EXCAVATION, AND SHALL IMMEDIATELY NOTIFY THE ARCHITECT OF ANY DISCREPANCIES.
2. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING UTILITIES AND POINTS OF CONNECTION PRIOR TO BIDDING PROJECT.
3. WHERE PLANS INDICATE NEW FIXTURES OR EQUIPMENT CONNECTING TO EXISTING SERVICES, PLUMBING CONTRACTOR SHALL MODIFY AND/OR EXTEND EXISTING PIPING OR ROUGH-INS AS REQUIRED TO SUIT THE NEW FIXTURE.

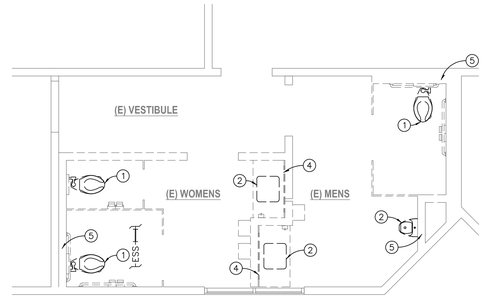
CONSTRUCTION KEY NOTES:

(1) CONTRACTOR SHALL ROUGH-IN AND CONNECT TO EXISTING SERVICES FOR NEW WATER CLOSET.
(2) CONTRACTOR SHALL ROUGH-IN AND CONNECT TO EXISTING SERVICES FOR NEW WATER HAMMER ARRESTOR.
(3) CONTRACTOR SHALL ROUGH-IN AND CONNECT TO NEW AND EXISTING SERVICES FOR NEW WATER HEATER.
(4) P.O.C. NEW 4" SEWER LINE TO EXISTING SEWER LINE BELOW GRADE. FIELD VERIFY EXACT LOCATION PRIOR TO INSTALLATION OF ANY PIPING.
(5) P.O.C. NEW 2" VENT LINE TO EXISTING VENT THRU ROOF ABOVE CEILING. FIELD VERIFY EXACT LOCATION PRIOR TO INSTALLATION OF ANY PIPING.
(6) P.O.C. NEW 2" VENT LINE TO EXISTING VENT ABOVE CEILING. FIELD VERIFY EXACT LOCATION PRIOR TO INSTALLATION OF ANY PIPING.
(7) P.O.C. NEW 2" VENT LINE TO EXISTING VENT LINE IN WALL. FIELD VERIFY EXACT LOCATION PRIOR TO INSTALLATION OF ANY PIPING.
(8) P.O.C. NEW 2" COLD WATER LINE WITH SHUT-OFF VALVE TO EXISTING COLD WATER LINE ABOVE CEILING. FIELD VERIFY EXACT LOCATION PRIOR TO INSTALLATION OF ANY PIPING.
(9) 1-1/2" CW DN IN WALL W/ S.O.V. & AP
(10) CONTRACTOR SHALL ROUGH-IN AND CONNECT TO EXISTING SERVICES FOR NEW HOSE BIB.
(11) P.O.C. NEW 3/4" COLD WATER LINE TO EXISTING HOSE BIB.

NORTH

PLUMBING ENLARGED PROPOSED STAFF RESTROOM PLAN

SCALE 1/4"=1'-0" | 2



DEMOLITION NOTES:

1. OWNER SHALL HAVE FIRST RIGHT OF REFUSAL ON ALL ITEMS INDICATED TO BE REMOVED. CONTRACTOR SHALL VERIFY ALL SUCH ITEMS WITH OWNER PRIOR TO REMOVAL. ALL ITEMS NOT REFUSED BY OWNER SHALL BE REMOVED INTACT AND FULLY FUNCTIONAL BY CONTRACTOR FOR OWNER'S USE. ALL ITEMS REFUSED BY OWNER SHALL BE PROPERLY DISPOSED OF BY CONTRACTOR.
2. REMOVE EXISTING FIXTURES AND EQUIPMENT AS INDICATED. HOT WATER, COLD WATER, VENT AND/OR GAS PIPING SERVING SUCH ITEMS SHALL BE REMOVED TO A SUITABLE CONCEALED LOCATION WITHIN WALL OR ABOVE CEILING AND CAPPED OR PLUGGED UNLESS OTHERWISE NOTED (U.O.N.). WASTE PIPING SERVING SUCH FIXTURES SHALL BE REMOVED TO A SUITABLE CONCEALED LOCATION BELOW FINISHED FLOOR OR BEHIND WALL AND CAPPED OR PLUGGED U.O.N. ASSOCIATED EXISTING DEFUNCT PIPING IN CONCEALED LOCATIONS ABOVE CEILING, WITHIN WALLS, BELOW SLAB, OR BELOW GRADE SHALL BE ABANDONED IN PLACE OR REMOVED AS NECESSARY TO AVOID INTERFERENCE WITH NEW WORK. ASSOCIATED EXISTING DEFUNCT PIPING AND COMPONENTS IN EXPOSED LOCATIONS SHALL BE REMOVED U.O.N. (INCLUDING FLOOR DRAINS, WALL AND FLOOR CLEANOUTS, CLEANOUTS TO GRADE, ACCESS PANELS, SHUT-OFF VALVES AND COCKS, YARD BOXES, MANHOLES, CATCH BASINS, AND OTHER EXPOSED COMPONENTS). EXISTING DEFUNCT ELECTRICAL COMPONENTS SERVING EXISTING TO BE REMOVED EQUIPMENT SHALL BE DEMOLISHED AND REMOVED TO POINT OF ORIGIN.

DEMOLITION KEY NOTES:

(1) EXISTING WATER CLOSET TO BE REMOVED BY PLUMBING CONTRACTOR.
(2) EXISTING URINAL TO BE REMOVED BY PLUMBING CONTRACTOR.
(3) EXISTING LAVATORY TO BE REMOVED BY PLUMBING CONTRACTOR.
(4) EXISTING WATER HEATER TO BE REMOVED BY PLUMBING CONTRACTOR.
(5) EXISTING WATER HAMMER ARRESTOR TO BE REMOVED BY PLUMBING CONTRACTOR.

NORTH

PLUMBING ENLARGED EXISTING/DEMO STAFF RESTROOM PLAN

SCALE 1/4"=1'-0" | 1

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architect

REGISTERED PROFESSIONAL ENGINEER
ANDREW R. GOSSELIN
No. M30828
Exp. 3/31/26
MECHANICAL
STATE OF CALIFORNIA

PDS
Pocock Design Solutions Inc.

consultant

WILLIAM COLLIER ELEM SCHOOL SHADE STRUCTURE ADDITION & PLAYGROUND IMPROVEMENTS

LAKE ELSINORE UNIFIED SCHOOL DISTRICT
20150 MAYHALL DR.
WILDOMAR, CA. 92595

tBP project number: 24006.00
file name:
drawn by: E.M. checked by: E.M.
date:

rev:	date:	description:
	07/02/26	DSA SUBMITTAL

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drawing title:
PLUMBING DEMOLITION AND NEW FLOOR PLAN

drawing no.:
P2-1

M BAR C MULTI-PURPOSE/GYM CANOPY 22.0



PC OWNERSHIP

M BAR C CONSTRUCTION INC.

1770 LA COSTA MEADOWS DR.
SAN MARCOS, CA 92078

LIC # 869960
B AND C51

POINT OF CONTACT:
GREG JONES

PHONE: (760) 744-4131
FAX: (760) 744-4449

STANDARD NOTES FOR PC USE

- 4 S.T.E.L. ENGINEERING, INC. IS AVAILABLE TO BID THE GENERATION OF THE FULL DSA SUBMITTAL PACKAGE ACTING AS THE DESIGN PROFESSIONAL IN GENERAL RESPONSIBLE CHARGE (DPGRC) OR TO SUPPORT THE DPGRC AS THE SITE SPECIFIC STRUCTURAL ENGINEER OF RECORD (SEOR). CONTACT DUSTIN ROSEPINK AT 4 S.T.E.L. ENGINEERING, INC FOR A PROPOSAL FOR SERVICES AT (949) 305-1150, DKRPINK@4STELENG.COM
- FOR CONSTRUCTION COST INFORMATION, CONTACT M BAR C CONSTRUCTION, INC.
- CUSTOM SIZES AND LOADING REQUIRE SUPPLEMENTARY SHOP DRAWINGS AND CALCULATIONS.

LEGAL NOTES

- USE OF THE PC WITHOUT WRITTEN CONSENT FROM M BAR C CONSTRUCTION, INC. IS STRICTLY PROHIBITED.
- ALL INFORMATION HEREIN IS PROPRIETARY INFORMATION AND UNDER THE OWNERSHIP OF M BAR C CONSTRUCTION, INC.

DESIGN PARAMETER NOTES

1. REFER TO SHEET S-2 FOR 'DESIGN CHECK LIST' AND 'SITE SPECIFIC PARAMETERS'.
2. WHEN A SITE-SPECIFIC PROJECT IS LOCATED IN A FLOOD ZONE OTHER THAN ZONE X, A LETTER STAMPED FROM A GEOTECHNICAL ENGINEER IS REQUIRED IS NEEDED TO VALIDATE THE ALLOWABLE SOIL VALUES SPECIFIED IN THE PC DRAWINGS ARE STILL APPLICABLE. UNLESS THE BOTTOMS OF FOUNDATIONS ARE RAISED ABOVE THE DESIGN FLOOD ELEVATION, A VALIDATION LETTER FROM THE GEOTECHNICAL ENGINEER SHALL BE PROVIDED, EVEN IF THE PRESUMPTIVE LOAD BEARING VALUES PER CBC SECTION 1806A.2 ARE USED.
   EXCEPTION: WHEN A SITE-SPECIFIC PROJECT IS LOCATED IN A FLOOD ZONE D (UNDEFINED) AND THE APPLICANT PROVIDES EVIDENCE FROM THE LOCAL JURISDICTION OR A QUALIFIED DESIGN PROFESSIONAL CONFIRMING THE SITE IS NOT IN A FLOOD HAZARD ZONE.
3. WET STAMPED & SIGNED COPIES OF PC PLANS ARE NOT REQUIRED FOR SITE SPECIFIC PC USE.
4. CHANGES TO PC DOCUMENTS ARE GOVERNED BY DSA PL 07-02, SECTION 5. INCONSEQUENTIAL CHANGES MAY BE MADE TO THE EXTENT THAT THEY CAN BE REVIEWED WITHIN THE TWO-HOUR OTC TIME FRAME. CHANGES TO CODE-REGULATED ASPECTS TO PC DOCUMENTS ARE NOT PERMITTED AND SHALL BE SUBMITTED AND REVIEWED THROUGH THE REGULAR PLAN REVIEW PROCESS.
5. THE SITE SPECIFIC DESIGN PROFESSIONAL IN GENERAL RESPONSIBLE CHARGE IS RESPONSIBLE FOR ENSURING ALL INFORMATION SHOWN IN THE DESIGN PARAMETER CHECKLIST ARE MET AND PROVIDED AT THE TIME OF DSA SUBMITTAL.
6. THE SITE SPECIFIC DESIGN PROFESSIONAL IN GENERAL RESPONSIBLE CHARGE IS RESPONSIBLE FOR ENSURING 4 S.T.E.L. ENGINEERING, INC. HAS BEEN PROPERLY CONTRACTED TO PERFORM THE ROLE AS SEOR. NO OTHER FIRM SHALL PERFORM THE SEOR ROLE. 4 S.T.E.L. ENGINEERING, INC./DUSTIN ROSEPINK SHALL ONLY ACT AS THE SEOR IF PROPERLY CONTRACTED.
7. 4 S.T.E.L. ENGINEERING, INC./DUSTIN ROSEPINK WILL NOT SIGN ANY DSA FORMS (I.E. DSA-5, DSA-6, ETC.), REVIEW OR APPROVE ANY SUBMITTALS (I.E. GEOTECHNICAL REPORTS, CONCRETE MIX DESIGNS, SHOP DRAWINGS, ETC.) FOR THE SITE SPECIFIC PROJECT UNLESS HE IS ACTING AS THE DESIGN PROFESSIONAL IN GENERAL RESPONSIBLE CHARGE OR THE SITE SPECIFIC STRUCTURAL ENGINEER OF RECORD PER NOTE 3 ABOVE.
8. THE PC STRUCTURAL MEMBERS ARE DESIGNED TO THE FOLLOWING ASCE 7-16 (SUPPLEMENT 3) SEISMIC CRITERIA: S_S = 2.8, S_{DS} = 1.867, S_1 = 1.39, R = 3.5.
9. CUSTOM SIZES & LOADINGS REQUIRE SUPPLEMENTARY SHOP DRAWINGS & CALCULATIONS.
10. THE PC STRUCTURE(S) ARE APPROVED FOR BOTH CLEAR AND OBSTRUCTED WIND FLOW.

SHEET INDEX

- ☑ S-1 .....TITLE SHEET
- ☑ S-2 .....GENERAL DATA
- ☑ S-3 .....GENERAL NOTES
- ☑ S-4 .....EXAMPLE DSA-103 FORMS
- ☑ S-5 .....SECTION PROPERTIES & REBAR DETAILS
- ☑ S-6 .....FRAMING PLAN
- ☑ S-7 .....FRAMING ELEVATIONS
- ☑ S-8 .....FOUNDATION DETAILS
- ☑ S-9 .....FRAMING CONNECTION DETAILS
- ☑ S-10 .....PURLIN & ROOF DECK DETAILS

10 SHEETS

BID INFORMATION

THE STEEL STRUCTURES IN THIS PC ARE PROPRIETARY TO M BAR C CONSTRUCTION, INC. THE STEEL WORK SHALL NOT GO OUT TO BID.

PRE-CHECK (PC) DOCUMENT

CODE: 2022 CBC

A SEPARATE PROJECT APPLICATION FOR CONSTRUCTION IS REQUIRED

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 04-125584 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 09/01/2026

4 STEL ENGINEERING
26030 ACERO,
MISSION VIEJO, CA 92691
949.305.1150 | FAX 949.305.1420

M BAR C CONSTRUCTION INC.
1770 LA COSTA MEADOWS DRIVE, SAN MARCOS, CA 92078
ERIK KRIVOPOPICH
PHONE: (760) 744-4131
FAX: (760) 744-4449
ERIK@MBARCONLINE.COM
LIC # 869960
B AND C51
(775) 787-5845

ENGINEER'S APPROVAL

REGISTERED PROFESSIONAL ENGINEER
DUSTIN K. ROSEPINK
S 5885
STRUCTURAL
CIVIL
STATE OF CALIFORNIA

APPROVED
DIV. OF THE STATE ARCHITECT
APP: 04-122015 PC
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑ CG ☐
DATE: 11/09/2023

SITE SPECIFIC INFORMATION

REVISIONS

MARK	DATE	DESCRIPTION

4 STEL JOB #	MC05-02-1
DATE	11-01-23
DRAWN BY	NML
CHECKED	CDL

TITLE SHEET

S-1

NOTE: IF DWG. IS NOT 24 x 36, IT IS NOT FULL SIZE

DESIGN CHECK LIST

INSTRUCTIONS:
DESIGN PROFESSIONAL SHALL ENSURE ADEQUACY OF PC DESIGN AND PLAN PREPARATION BY VERIFYING THAT ALL THE APPLICABLE CHECKLIST ITEMS BELOW HAVE BEEN PROPERLY EVALUATED/EXECUTED

SUBMISSION IS FOR: ☐ OTC ☒ REGULAR SUBMITTAL

SEOR

- ☒ S-2: VERIFY THAT TABLES IN 'SITE SPECIFIC PARAMETERS' SECTION HAVE BEEN COMPLETED
- ☒ S-2: VERIFY WHETHER SPRINKLERS ARE INSTALLED PER 'MAX. DESIGN PARAMETERS' OPTION.
- ☒ S-2: VERIFY IF CGS APPROVAL OF GEOTECHNICAL REPORT REQUIRED BECAUSE INDIVIDUAL PC STRUCTURES EXCEED 4000 SQ FT OR SITE IS LOCATED IN A STATE OR LOCAL GEOHAZARD ZONE. STRUCTURES MAY BE BROKEN UP INTO MULTIPLE 4,000 SQ FT STRUCTURES WITH SEISMIC BREAKS PER SEISMIC GAPS ON S-2.
- ☒ S-2: VERIFY SITE-SPECIFIC WIND PARAMETERS AT ANY AND ALL SITES WHERE THIS PC IS USED. THIS PC DESIGN IS BASED ON WIND SPEED 105 MPH FOR RISK CATEGORY III TYPE STRUCTURES UTILIZING EXPOSURE TYPE C PER ASCE 7-16.
- ☒ S-2: VERIFY THE MAXIMUM SEISMIC S_{DS} AT THE SITE DOES NOT EXCEED S_{DS} = 1.867.
- ☒ S-2: VERIFY THE SITE SPECIFIC SNOW LOAD AND ENSURE ALL SITE SPECIFIC PC SELECTIONS MEET OR EXCEED THE SITE SPECIFIC SNOW LOAD. THIS PC HAS OPTIONS FOR NO SNOW AND 20 PSF SNOW LOAD. VERIFY THE SITE SPECIFIC DESIGN PROFESSIONAL HAS PROVIDED THE PROPER SITE SPECIFIC VALUES FOR P_G, P_F, P_S, C_E, I, C_T. FOR SNOW LOADS IF THE HORIZONTAL SEPARATION FROM ANY STRUCTURE IS LESS THAN 20-FT, SNOW DRIFT ANALYSIS SHALL BE PROVIDED BY THE PC APPLICANT, AND THE SITE APPLICATION IS NOT ELIGIBLE FOR OVER-THE-COUNTER (OTC) SUBMITTAL.
- ☒ S-2: VERIFY THE SITE SPECIFIC PLANS UTILIZE A RISK CATEGORY II OR III STRUCTURE. RISK CATEGORY III STRUCTURES SHALL NOT PROVIDE SHELTER FOR EMERGENCY VEHICLES OR EQUIPMENT; OR PROVIDE REQUIRED ACCESS TO, REQUIRED EGRESS FROM, OR SHARE A LIFE SAFETY COMPONENT WITH A RISK CATEGORY IV STRUCTURE.
- ☒ S-2: VERIFY SELECTION OF USE AND OCCUPANCY CLASSIFICATION PER CBC CHAPTER 3; OCCUPANT LOAD FACTOR PER CBC TABLE 1004.5; RISK CATEGORY PER CBC TABLE 1604A.5; TO BE COMPLETED BY DESIGN PROFESSIONAL AT TIME OF DSA OTC OR PROJECT DSA SUBMITTAL.
- ☒ S-2: VERIFY APPROPRIATE SEISMIC SEPARATION PER 'STRUCTURAL DATA'
- ☒ S-2: VERIFY 'CONSTRUCTION OPTIONS' ARE SELECTED
- ☒ S-2: VERIFY MAX. DESIGN PARAMETERS, SPRINKLER YES OR NO, SEISMIC SITE CLASS, ARE SELECTED
- ☒ S-3: VERIFY THAT OPTIONS FOR CONCRETE DURABILTY BASED ON EXPOSURE CLASS AND THE FOUNDATION SOILS CLASS HAVE BEEN SELECTED.
- ☒ S-3: VERIFY THE SITE SPECIFIC FOUNDATION LOCATIONS MEET WITH NOTE 9 ON S-3 IN THE SOILS NOTES SECTION FOR SET BACK FROM TOP OF SLOPES, OR THAT THE GEOTECHNICAL REPORT HAS ALLOWED A SMALLER DISTANCE.
- ☐ S-3: ALLOWABLE LATERAL PRESSURE OF SOIL AT PROJECT SITE LIMITS GROUND-LEVEL LATERAL DISPLACEMENT OF THE STRUCTURE TO A MAXIMUM OF 1/2"
- ☐ S-3: SITE SPECIFIC GEOTECHNICAL REPORT HAS BEEN PROVIDED WITH A GEOHAZARD SECTION INCLUDED. REFER TO SOILS NOTES #1 ON SHEET S-3 IF NO GEOTECHNICAL REPORT IS PROVIDED.
- ☒ S-3: SITE SPECIFIC DESIGN PROFESSIONAL IN GENERAL RESPONSIBLE CHARGE TO SELECT SOILS CLASS FOR SITE SPECIFIC USE.
- ☒ S-5: VERIFY THAT HOT ROLLED SECTIONS 5/S-5 & 6/S-5 HAVE BEEN SELECTED BASED ON THE SITE SPECIFIC PC ID'S UTILIZED IN BEAM & COLUMN SCHEDULE 1/S-6.
- ☒ S-6: VERIFY PITCHED OR MONOSLOPE OPTION IS SELECTED.
- ☒ S-6: VERIFY PURLIN CANTILEVER SPAN BLOCKING MIDSPAN OR NO BLOCKING OPTION.
- ☒ S-7: VERIFY DETAIL 1 OR 2 IS SELECTED AND M1-M4 OPTIONS, FOUNDATION DETAIL OPTIONS, BASE CONNECTION OPTIONS AREA SELECTED.
- ☒ S-7: VERIFY DETAIL 3 PITCHED OR MONOSLOPE ROOF OPTION IS SELECTED, FOUNDATION AND NONSTRUCTURAL BOLLARD DETAIL OPTIONS.
- ☒ S-8: DETAIL 1 & 3, VERIFY PC ID FOUNDATION SELECTION MATCHES SITE SPECIFIC LAYOUT AND THAT SOILS CLASS SELECTION MATCHES S-3. VERIFY THAT SPIRAL TIE LENGTH AND SPACINGS HAVE BEEN SELECTED IN DETAIL 3. VERIFY IF STEEL CASING REQUIRED IN DETAIL 1. VERIFY IF NON-STRUCTURAL BOLLARD IS REQUIRED PER DETAIL 5/S-12.
- ☒ S-8: DETAIL 2, VERIFY SPREAD FOOTING PC ID SELECTION MATCHES SITE SPECIFIC LAYOUT. VERIFY IF NON-STRUCTURAL BOLLARD IS REQUIRED PER DETAIL 5/S-8.
- ☒ S-8: DETAIL 1, 2, 5, VERIFY EMBEDDED OR BASE PLATE COLUMN OPTION
- ☐ S-8: DETAIL 4, VERIFY BASE PLATE COLUMN OPTION IS USED
- ☒ S-8: VERIFY OPTIONAL NONSTRUCTURAL BOLLARD SELECTIONS MATCH SITE SPECIFIC PLANS. VERIFY FOUNDATION OPTIONS FOR CONDUIT ROUTING MATCH SITE SPECIFIC PLANS.
- ☐ S-8: VERIFY IF PIER FOUNDATION STRADDLES THE INTERFACE BETWEEN HARD/STIFF AND SOFT SOILS STRATA
- ☒ S-9: DETAIL 4, 8, 13, VERIFY M1-4 OPTIONS ARE SELECTED
- ☒ S-10: VERIFY APPLICABLE LIGHTING DETAIL 14/S-10 IS SELECTED.
- ☒ S-10: VERIFY WHETHER DETAIL 9/S-10, 11/S-10 OPTIONS ARE SELECTED.

SITE SPECIFIC PARAMETERS

INSTRUCTIONS:
DESIGN PROFESSIONAL SHALL CHECK THE APPROPRIATE SELECTION BOXES BELOW AND ENTER THE DESIGN PARAMETERS APPLICABLE TO THE SPECIFIC PROJECT SITE.

SNOW

☒ 0 psf | pg = _____ psf | pf = _____ psf ☐ 5 psf ☐ 20 psf | Ce = _____

WIND

V = 102 mph < 105 mph
Kzt = 1 ≤ 1
EXPOSURE: ☒ C ☐ D

SEISMIC

SELECT ONE

☒ DESIGN BASED ON SITE CLASS D DEFAULT
NO GEOTECHNICAL INVESTIGATION REQUIRED
S_S = 1.73 Fa = 1.2

☐ DESIGN BASED ON SITE CLASS DETERMINED PER CHAPTER 20 OF ASCE 7-16
GEOTECHICAL INVESTIGATION PROVIDED
SITE CLASS: ☐ C ☐ D ☐ E
S_S = _____ Fa =_____ PER ASCE 7-16 SUPPL 3, TABLE 11.4-1

☐ DESIGN BASED ON SITE SPECIFIC GROUND MOTION HAZARD ANALYSIS PER CHAPTER 21 OF ASCE 7-16
SHORT-PERIOD DESIGN SPECTRAL RESPONSE PARAMETER, S_{DS}, SHALL BE AS SPECIFIED IN GEOTECHNICAL INVESTIGATION
CGS APPROVAL REQUIRED
NOT ELIGIBLE FOR OTC REVIEW
SITE CLASS: ☐ C ☐ D ☐ E

S_{DS} = $^2/_3$ Fa. S_s = 1.39 ≤ 1.867
C_S = _____ < 0.667 USED IN DESIGN
SEISMIC DESIGN CATEGORY: ☒ D ☐ E

STRUCTURAL DATA

LATERAL RESISTING SYSTEM..... ORDINARY STEEL MOMENT FRAME
FOUNDATION ..... CONCRETE DRILLED PIERS AND SPREAD FOOTINGS
MINIMUM SEISMIC SEPARATION..... 6.0"
TESTING AND INSPECTION LIST..... SEE SHEETS S-3 & S-4

MAX. DESIGN PARAMETERS

RISK CATEGORY III
ROOF LIVE LOAD (L_R):
DECK ONLY ..... 20 psf
POINT LOAD ..... 300 lb

SNOW:
GROUND SNOW, P_G = ☒ 0 PSF, ☐ 5 PSF, ☐ 20.0 PSF
C_E = 0.9
C_T = 1.2
I = 1.0
C_S = 1.0
P_S = $0.7 C_E C_T I P_G C_S$
ROOF SNOW, P_F = ☒ 0 PSF, ☐ 5 PSF, ☐ 20.0 PSF
$P_{S\,E}$ = 0.0 PSF

MAXIMUM DEAD LOAD:
ROOF DECK..... 0.93 psf
SPRINKLER..... 1.46 psf ☐ YES ☒ NO
(SEISMIC MASS ONLY. SITE SPECIFIC SPRINKLER CONNECTIONS ARE NOT PROVIDED IN THIS PC. CALCULATIONS AND DETAILS FOR SPRINKLERS PROVIDED BY OTHERS.)

WIND: ASCE 7-16 METHOD 2 - ANALYTICAL PROCEDURE
BASIC WIND SPEED..... 105 mph
WIND EXPOSURE C
INTERNAL PRESSURE ..... N/A (OPEN STRUCTURE)
WIND DIRECTIONALITY FACTOR ..... K_d = 0.85
VELOCITY PRESSURE COEFFICIENT..... K_z = 0.96
☒ TOPOGRAPHIC FACTOR ..... K_{zt} = 1.00

SEISMIC: ASCE 7-16
SEISMIC IMPORTANCE FACTOR ..... I = 1.25
RESPONSE MODIFICATION FACTOR..... R = 3.5
MAPPED SPECTRAL RESPONSE ..... S_S = 2.8
ACCELERATION S_1 = 1.39
SITE CLASS ..... ☒ A-D ☐ E (NOT IN LIQUEFIABLE SOIL AND/OR SITE CLASS F)
DESIGN SPECTRAL RESPONSE ..... S_{DS} = 1.867
S_{D1} = 1.390
SEISMIC DESIGN CATEGORY ..... E (1)
SEISMIC FORCE RESISTING SYSTEM ..... ORDINARY STEEL MOMENT FRAME (OMF) BOTH DIRECTIONS
SEISMIC RESPONSE COEFFICIENT ..... $C_S = S_{DS}$ I/R = 0.667
ANALYSIS PROCEDURE ..... EQUIVALENT LATERAL FORCE
BASE..... FROM USABLE SOIL HT. PER GEOTECHNICAL REPORT

NOTES:
1. FOR BUILDINGS ASSIGNED TO SEISMIC DESIGN CATEGORY E OR F, A GROUND MOTION HAZARD ANALYSIS SHALL BE PERFORMED IN ACCORDANCE PER ASCE 7-16 (SUPPLEMENT 3) CH 21 AS MODIFIED BY CBC SECTION 1803A.6

CONSTRUCTION TYPE

TYPE OF CONSTRUCTION..... II-B
OCCUPANCY..... A-2/A-3

NOTE: OCCUPANCIES OTHER THAN A-2/A-3 MAY BE UTILIZED PROVIDED THEY CONFORM TO THE FOLLOWING:
1) RISK CATEGORY IS SELECTED IN ACCORDANCE WITH 2022 CBC TABLE 1604A.5, PENDING DSA SITE SPECIFIC APPROVAL.
2) OCCUPANCY IS DETERMINED IN ACCORDANCE WITH THE REQUIREMENTS OF 2022 CBC CHAPTERS 3 AND 5.
3) THE ALLOWABLE HEIGHT AND BUILDING AREA IS LIMITED TO THE REQUIREMENTS PER 2022 CBC TABLE 504.3.

NUMBER OF STORIES..... 1
ALLOWABLE BUILDING AREA..... 9,500 SQ. FT.
BUILDING LENGTH:..... MAXIMUM 500 FT LENGTH

NOTE: SEISMIC AND/OR THERMAL EXPANSION JOINTS NOT REQUIRED ALONG THE LENGTH OF THE STRUCTURES (ALL JOINTS ARE INTERNAL).

GENERAL NOTES

1. ALL WORK SHALL CONFORM TO 2022 TITLE 24, CALIFORNIA CODE OF REGULATIONS (CCR)
2. CHANGES TO THE APPROVED DRAWINGS AND SPECIFICATIONS SHALL BE MADE BY ADDENDA OR CONSTRUCTION CHANGE DOCUMENTS APPROVED BY THE DIVISION OF THE STATE ARCHITECT, AS REQUIRED BY SECTION 4-338, PART 1, TITLE 24, CCR.
3. A 'DSA CERTIFIED' PROJECT INSPECTOR EMPLOYED BY THE DISTRICT (OWNER) AND APPROVED BY THE DIVISION OF THE STATE ARCHITECT SHALL PROVIDE CONTINUOUS INSPECTION OF THE WORK. THE DUTIES OF THE INSPECTOR ARE DEFINED IN SECTION 4-342, CALIFORNIA BUILDING STANDARDS ADMINISTRATIVE CODE (PART 1, TITLE 24, CCR).
4. A 'DSA CERTIFIED' INSPECTOR WITH CLASS 2 CERTIFICATION IS REQUIRED FOR THIS PROJECT.
5. A DSA ACCEPTED TESTING LABORATORY DIRECTLY EMPLOYED BY THE SCHOOL BOARD SHALL CONDUCT ALL THE REQUIRED TESTS AND INSPECTIONS FOR THE PROJECT.
6. GRADING PLANS, DRAINAGE IMPROVEMENTS, ROAD AND ACCESS REQUIREMENTS AND ENVIRONMENTAL HEALTH CONSIDERATIONS SHALL COMPLY WITH ALL LOCAL ORDINANCES.
7. IF THE PROJECT IS DIVIDED INTO INCREMENTS: THE SCOPE OF WORK FOR EACH INCREMENT MUST BE CLEARLY SPECIFIED ON THE TITLE SHEET OF ALL INCREMENTS SUBMITTED.

CODES

GOVERNING CODES:

CALIFORNIA CODE OF REGULATIONS:

2022 CALIFORNIA ADMINISTRATIVE CODE, PART 1, TITLE 24 C.C.R.
2022 CALIFORNIA BUILDING CODE (CBC), PART 2, TITLE 24 C.C.R.
(2021 INTERNATIONAL BUILDING CODE VOLUMES 1-2 AND 2022 CALIFORNIA AMENDMENTS)
2022 CALIFORNIA ELECTRICAL CODE (CEC), PART 3, TITLE 24 C.C.R.
(2020 NATIONAL ELECTRICAL CODE AND 2022 CALIFORNIA AMENDMENTS)
2022 CALIFORNIA MECHANICAL CODE (CMC) PART 4, TITLE 24 C.C.R.
(2021 UNIFORM MECHANICAL CODE AND 2022 CALIFORNIA AMENDMENTS)
2022 CALIFORNIA PLUMBING CODE (CPC), PART 5, TITLE 24 C.C.R.
(2021 UNIFORM PLUMBING CODE AND 2022 CALIFORNIA AMENDMENTS)
2022 CALIFORNIA ENERGY CODE (CEC), PART 6, TITLE 24 C.C.R.
2022 CALIFORNIA FIRE CODE, PART 9, TITLE 24 C.C.R.
(2021 INTERNATIONAL FIRE CODE AND 2022 CALIFORNIA AMENDMENTS)
2022 CALIFORNIA GREEN BUILDING STANDARDS CODE, PART 11, TITLE 24 C.C.R.
2022 CALIFORNIA REFERENCED STANDARDS, PART 12, TITLE 24 C.C.R.
TITLE 19 C.C.R., PUBLIC SAFETY, STATE FIRE MARSHAL REGULATIONS.

NFPA 13	AUTOMATIC FIRE SPRINKLER SYSTEMS	2022 EDITION
NFPA 72	NATIONAL FIRE ALARM & SIGNALING CODE	2022 EDITION

REFERENCE CODE SECTIONS FOR APPLICABLE STANDARDS:

2022 CBC, CHAPTER 35
2022 CFC, CHAPTER 80

CONSTRUCTION OPTIONS

ALL CONSTRUCTION OPTIONS INCLUDE OPTIONS FOR CONCRETE DRILLED PIERS AND/OR SPREAD FOOTINGS.

☒ M1	40'-0" MAX. BEAM SPAN BETWEEN COLUMNS 2:12 MAX. ROOF SLOPE 21'-0" MAX. COLUMN HEIGHT 6'-0" MAX. BEAM CANTILEVER 0'-0" MIN. BEAM CANTILEVER	
☐ M2	40'-0" MAX BEAM SPAN BETWEEN COLUMNS 2:12 MAX. ROOF SLOPE 23'-0" MAX. COLUMN HEIGHT 6'-0" MAX. BEAM CANTILEVER 0'-0" MIN. BEAM CANTILEVER	
☐ M3	66'-0" MAX. BEAM SPAN BETWEEN COLUMNS 2:12 MAX. ROOF SLOPE 21'-0" MAX. COLUMN HEIGHT 10'-0" MAX. BEAM CANTILEVER 0'-0" MIN. BEAM CANTILEVER	
☐ M4	66'-0" MAX. BEAM SPAN BETWEEN COLUMNS 2:12 MAX. ROOF SLOPE 23'-0" MAX. COLUMN HEIGHT 10'-0" MAX. BEAM CANTILEVER 0'-0" MIN. BEAM CANTILEVER	

FIRE LIFE SAFETY

AUTOMATIC FIRE SPRINKLERS REQUIRED? (Y/N)..... N

1. FOR ALL CANOPY ARRAYS - VERIFY COMPLIANCE W/ CFC 503.2.1
NEW FIRE APPARATUS ACCESS ROADS SHALL HAVE AN UNOBSTRUCTED WIDTH OF NOT LESS THAN 20 FEET, EXCLUSIVE OF SHOULDERS, EXCEPT FOR APPROVED SECURITY GATES IN ACCORDANCE WITH SECTION 503.6, AND AN UNOBSTRUCTED VERTICAL CLEARANCE OF NOT LESS THAN 13 FEET 6 INCHES

ACCESS

1. CONCRETE BOLLARD ABOVE FOUNDATIONS (RAISED PIERS) CANNOT BE LOCATED IN ACCESSIBLE PARKING SPACES OR ACCESS AISLES.
2. SLOPED PORTIONS OF FOUNDATIONS, WHEN LOCATED IN ACCESSIBLE PARKING STALL OR ACCESS AISLE, MUST HAVE A SLOPE LESS THAN OR EQUAL TO 2.08%
3. MINIMUM ARRAY CLEAR HEIGHTS IN ACCESSIBLE AREAS:
8'-2" - WHEN LOCATED OVER ACCESSIBLE PARKING OR ACCESS AISLES
9'-6" - WHEN LOCATED OVER ACCESSIBLE PASSENGER LOADING ZONES

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 04-125584 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 09/01/2026

4 STEL ENGINEERING
26030 ACERO,
MISSION VIEJO, CA 92691
949.305.1150 | FAX 949.305.1420

MBAR C CONSTRUCTION INC.
1770 LA COSTA MEADOWS DRIVE, SAN MARCOS, CA 92078
PHONE: (760) 744-4131
FAX: (760) 744-4449
ERIK@MBARCONLINE.COM
LIC # 869960 B AND C-57
(770) 787-8845
ERIK KRIVOPOPCH

ENGINEER'S APPROVAL

REGISTERED PROFESSIONAL ENGINEER DUSTIN K. ROSEMAN S 5885 CIVIL STATE OF CALIFORNIA

BID INFORMATION
THE STRUCTURES AND DESIGNS IN THIS PC ARE PROPRIETARY TO M BAR C CONSTRUCTION, INC. AND 4 S.T.E.L. ENGINEERING, INC. ALL SITES USING THIS PC: M BAR C CONSTRUCTION, INC. SHALL BE THE STEEL CONTRACTOR & 4 S.T.E.L. ENGINEERING, INC. SHALL BE THE SEOR. SEE THE STANDARD NOTES FOR PC USE ON S-1 FOR ADDITIONAL REQUIREMENTS.

PRE-CHECK (PC) DOCUMENT
CODE: 2022 CBC
A SEPARATE PROJECT APPLICATION FOR CONSTRUCTION IS REQUIRED

~~APPROVED
DIV. OF THE STATE ARCHITECT
APP: 04-122015 PC
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑ CG ☐
DATE: 11/09/2023~~

SITE SPECIFIC INFORMATION

REVISIONS

MARK	DATE	DESCRIPTION

4 STEL JOB #	MC05-02-1
DATE	11-01-23
DRAWN BY	NML
CHECKED	CDL

GENERAL DATA

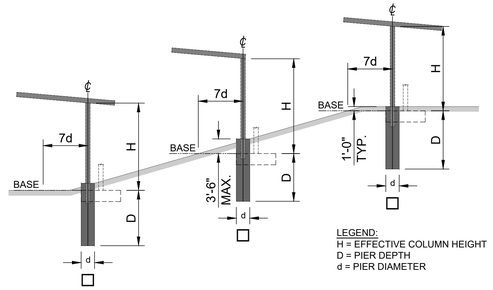
S-2

NOTE: IF DWG. IS NOT 24 x 36, IT IS NOT FULL SIZE

SOILS AND FOUNDATIONS

1. A SITE SPECIFIC GEOTECHNICAL REPORT IS REQUIRED.
2. THE GEOTECHNICAL ENGINEER SHALL REVIEW THE SITE CONDITIONS, TESTING RESULTS, AND ALL ALLOWABLE INCREASES AND SUPPLY THE FINAL SOIL CLASS TO BE USED FROM THE BELOW TABLE. THE GEOTECHNICAL ENGINEER SHALL PROVIDE IN THE GEOTECHNICAL REPORT THE FOLLOWING BASE VALUES WITHOUT INCREASE FOR 24" DIAMETER PIERS: THE ALLOWABLE VERTICAL END BEARING, ALLOWABLE LATERAL BEARING, ALLOWABLE DOWNWARD SKIN FRICTION, ALLOWABLE SKIN FRICTION TO RESIST UPLIFT. THE GEOTECHNICAL ENGINEER SHALL ALSO PROVIDE ANY ALLOWABLE INCREASES TO THE BASE VALUES. ALLOWABLE INCREASES ARE TYPICALLY DUE TO BUT NOT EXCLUSIVE TO: DOUBLE VALUES DUE TO ISOLATED FOUNDATIONS. DOUBLE VALUES DUE TO THE STRUCTURE NOT BEING ADVERSELY AFFECTED BY 1/2" DEFLECTION AT THE SURFACE, A 4/3 INCREASE DUE TO SHORT TERM LOADING, AND ANY OTHER ALLOWABLE INCREASES. THE GEOTECHNICAL ENGINEER SHALL MAKE RECOMMENDATION OF THE SOIL CLASS TO BE USED AFTER ALL INCREASES HAVE BEEN APPLIED. ALL FOUNDATIONS HAVE BEEN DESIGN BASED ON THE VALUES PRESENTED IN THE BELOW TABLE. THE GEOTECHNICAL REPORT SHALL ADDRESS IF THE USE OF STEEL CASING THAT IS TWISTED INTO PLACE AND LEFT INSTALLED AFFECTS ANY ALLOWABLE VALUES.
3. THE GEOTECHNICAL ENGINEER MAY SPECIFY DIFFERENT SOILS CLASSES TO BE USED FOR THE DIFFERENT STRUCTURE TYPES (VC14 OR VC20), DIFFERENT AREAS OF THE SITE (I.E. NORTH LOT OR WEST LOT), OR THE ENGINEER MAY SPECIFY ONE SOILS CLASS TO BE USED FOR THE ENTIRE SITE.
4. THE GEOTECHNICAL ENGINEER SHALL ADDRESS IN THE REPORT ANY CONCRETE DURABILITY REQUIREMENTS IN ACCORDANCE WITH ACI 318-19 CHAPTER 19.
5. THE GEOTECHNICAL REPORT SHALL BE SPECIFIC TO THE LOCATION OF THE STRUCTURES. BORING(S) SHALL BE DONE AT THE SPECIFIC LOCATION(S) WHERE THE STRUCTURES ARE TO OCCUR. THE GEOTECHNICAL REPORT SHALL CONFORM TO 2022 CBC SECTION 1803A.
6. A COPY OF THE GEOTECHNICAL REPORT SHALL BE PROVIDED AT THE TIME OF PLAN REVIEW.
7. AT THE TIME OF PLAN REVIEW, THE DESIGN PROFESSIONAL IN GENERAL RESPONSIBLE CHARGE SHALL SELECT A SOILS CLASS ON THE SITE-SPECIFIC PLANS BASED ON THE GEOTECHNICAL REPORT.

   HOLES MAY BE LEFT OPEN FOR ANY AMOUNT OF TIME AS LONG AS THEY ARE PROPERLY COVERED FOR OSHA STANDARDS.
8. DESIGN OF PC STRUCTURE ASSUMES A MAXIMUM LATERAL DISPLACEMENT OF 1/2" AT THE BASE; ALLOWABLE LATERAL BEARING VALUES THAT RESULT IN LARGER DISPLACEMENTS ARE NOT ACCEPTABLE FOR USE WITH THIS PC STRUCTURE
9. FOUNDATIONS ADJACENT TO SLOPED GROUND SURFACES SHALL BE SET BACK PER THE FOLLOWING FIGURE UNLESS OTHERWISE RECOMMENDED BY A SITE SPECIFIC GEOTECHNICAL REPORT.



LEGEND:
H = EFFECTIVE COLUMN HEIGHT
D = PIER DEPTH
d = PIER DIAMETER

BASE:
TOP OF 'USABLE SOIL PER GEOTECHNICAL REPORT'.
SEE DETAILS 1/S-7, 2/S-7, 3/S-7, 1/S-8, 2/S-8, 4/S-8 FOR BASE LOCATION.

PIER FOUNDATIONS - FINAL DESIGN VALUES [1,2,3,4,5]

USE	SOILS CLASS	VERTICAL BEARING PRESSURE (psf)	LATERAL BEARING PRESSURE (psf/ft)	MAXIMUM LATERAL BEARING (psf)	MIN. DOWNWARD SKIN FRICTION (psf)	MIN. UPWARD SKIN FRICTION (psf)
X	CLASS V	0	133	2,000	180	50
	CLASS W	0	267	4,000	240	100
	CLASS X	0	400	6,000	270	100
	CLASS Y	0	533	8,000	300	100
	CLASS Z	0	800	12,000	340	120

SPREAD FOOTINGS - FINAL DESIGN VALUES [1,2,3]

USE	SOILS CLASS	MIN. ALLOWABLE END BEARING (psf)	MIN. ALLOWABLE LATERAL BEARING (psf/ft)	MAX. LATERAL BEARING (psf)	SLIDING FRICTION μ
X	ALL	1,500	100	2,000	0.25

NOTES:

1. TABLE ALREADY TAKES INTO ACCOUNT 1/3 INCREASE AND DOUBLING OF THE PASSIVE PRESSURE WITHOUT ANY FURTHER INCREASES. GEOTECHNICAL ENGINEER IS REQUIRED TO SPECIFY THE SOILS CLASS WHERE FINAL VALUES WITH INCREASES ARE NOT ALLOWED TO EXCEED THESE VALUES)
2. DOUBLING THE PASSIVE PRESSURE DUE TO SOIL ARCHING EFFECTS IS NOT ALLOWED IN CONJUCTION WITH DOUBLING BASED ON THE 1/2" DEFLECTION AT THE SURFACE.
3. THE FOUNDATION DESIGNS FOR THIS PC ARE BASED ON 2022 CBC ALTERNATE BASIC LOAD COMBINATIONS PER SECTION 1605A.3.2 WHERE 1/3 INCREASES ARE ALLOWED.
4. END BEARING NOT USED FOR PIER FOUNDATION DESIGN.
5. WHEN NO GEOTECHNICAL REPORT IS PROVIDED USE SOIL CLASS V.

CONCRETE

1. CONCRETE MIN. 4,500 PSI AT 28 DAYS, WITH CEMENT TYPE V, AND WATER/CEMENT RATIO OF 0.45 UNLESS A SOILS REPORT IS PROVIDED THAT ALLOWS FOR ALOWER STRENGTH (4,000 PSI MIN.). BATCH PLANT INSPECTION NOT REQUIRED.
2. CONRETE SHALL MEET THE FOLLOWING MINIMUM REQUIREMENTS BASED ON EXPOSURE CLASS IN ACCORDANCE WITH ACI 318-19 TABLE 19.3.1.1 WHEN DETERMINED BY A SITE-SPECIFIC GEOTECHNICAL REPORT.

REQUIREMENTS FOR CONCRETE BASED ON EXPOSURE CLASS

USE	EXPOSURE CLASS ACI TABLE 19.3.1.1	MINIMUM CONCRETE STRENGTH F'_c	CEMENT TYPE ASTM C150	MAX. WATER/CEMENT RATIO W/M
X	NOT DETERMINED	4,500 PSI	TYPE V	0.45
	F0, S0, W0, W1, C0, C1	4,000 PSI	TYPE II	N/A
	S1, W2	4,000 PSI	TYPE II	0.50
	C2, F3	5,000 PSI	TYPE V	0.40
	ALL OTHER	4,500 PSI	TYPE V	0.45

3. CONCRETE EXPOSED TO THAW AND FREEZE CYCLE SHALL BE AIR ENTRAINED PER ACI 318-19 TABLE 19.3.3.1.
4. CONCRETE TO ATTAIN 1000 PSI PRIOR TO REMOVAL OF SHORING AND/OR INSTALLATION OF BEAMS AND PURLINS. (NOTE: A HIGHER COMPRESSIVE CONCRETE MAY BE USED TO ACHIEVE 1000 PSI SOONER. SUBMIT CONCRETE MIX DESIGN PREPARED BY A QUALIFIED LICENSED PROFESSIONAL ENGINEER FOR APPROVAL BY THE DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE PRIOR TO BEING PLACED.
5. CONCRETE TO REACH 4000 PSI PRIOR TO INSTALLATION OF ROOF DECK. (NOTE: A HIGHER COMPRESSIVE CONCRETE MAY BE USED TO ACHIEVE 4000 PSI SOONER. SUBMIT CONCRETE MIX DESIGN PREPARED BY A QUALIFIED LICENSED PROFESSIONAL ENGINEER FOR APPROVAL BY THE DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE PRIOR TO BEING PLACED.
6. REINFORCEMENT BARS SHALL BE ASTM A615, GR60 TYPICAL, U.N.O.
7. MINIMUM CONCRETE COVER SHALL BE 2½" TO EARTH (DRILLED PIER FOUNDATIONS ONLY), 3" TO EARTH ALL OTHER CONCRETE, 2" TO EXPOSED SURFACES PER CBC TABLE 1808A.8.2
8. ALL REINFORCING STEEL AND OTHER EMBEDDED ITEMS SHALL BE SECURELY POSITIONED PRIOR TO THE POURING OF CONCRETE.
9. ALL CONCRETE WORK SHALL COMPLY WITH ACI 301 & 318 STANDARDS.
10. AGGREGATE GRADATION AND QUALITY SHALL BE IN ACCORDANCE WITH ACI 302-IR.
11. COLD JOINTS SHALL HAVE A ROUGHENED SURFACE. BONDING AGENT SHALL COMPLY WITH ASTM C1059. A SUBMITTAL FOR CONCRETE BONDING AGENT SHALL BE APPROVED BY DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE PRIOR TO INSTALLATION. DSA INSPECTOR OF RECORD TO PERIODICALLY INSPECT INSTALLATION OF BONDING AGENT.
12. BATCH PLANT INSPECTION NOT REQUIRED PER CBC 1705A3.3.2. SUBJECT TO:
    - A LICENSED WEIGHMASTER SHALL POSITIVELY IDENTIFY QUANTITY OF MATERIALS AND CERTIFY EACH LOAD BY A BATCH TICKET.
    - BATCH TICKETS, INCLUDING MATERIAL QUANTITIES AND WEIGHTS SHALL ACCOMPANY THE LOAD, SHALL BE TRANSMITTED TO THE INSPECTOR OF RECORD BY THE TRUCK DRIVER WITH LOAD IDENTIFIED THEREON. THE LOAD SHALL NOT BE PLACED WITHOUT A BATCH TICKET IDENTIFYING THE MIX. THE INSPECTOR OF RECORD SHALL KEEP A DAILY RECORD OF PLACEMENTS, IDENTIFYING EACH TRUCK, ITS LOAD, AND TIME OF RECEIPT AT THE JOBSITE, AND APPROXIMATE LOCATION OF DEPOSIT IN THE STRUCTURE AND SHALL MAINTAIN A COPY OF THE DAILY RECORD AS REQUIRED BY THE ENFORCEMENT AGENCY.
13. CONCRETE MAY BE PUMPED, POURED, TAILGATED, OR OTHER SUCH METHODS INTO PLACE. CONCRETE SHALL BE ALLOWED TO FREE FALL THE ENTIRE DEPTH OF THE FOUNDATION, AS INDICATED IN ACI 304R-09, CHAPTER 5. PLACEMENT OF ANY FREE-FALL CONCRETE SHALL BE SUCH THAT THE CONCRETE DOES NOT ALTER THE EMBEDMENT DEPTH OR THE CLEARANCE OF THE REINFORCING BAR CAGE OR OTHER EMBEDDED MATERIALS.

STRUCTURAL STEEL

1. COLD FORMED STEEL SIZES ARE BASED ON BARE STEEL THICKNESS.
2. STRUCTURAL AND COLD FORMED STEEL PURLIN, BEAM AND COLUMN MEMBERS SHALL HAVE MINIMUM STEEL YIELD STRENGTH INDICATED.
3. EXPOSED STEEL FASTENERS INCLUDING CAST-IN-PLACE ANCHOR BOLTS SHALL BE EITHER HOT DIP GALVANIZED (ASTM A153, CLASS D MINIMUM), STAINLESS STEEL TYPE 304 MINIMUM OR PROTECTED WITH CORROSION PREVENTIVE COATING THAT DEMONSTRATED NO MORE THAN 2% OF RED RUST IN MINIMUM 1,000 HRS OF EXPOSURE TO SALT SPRAY TEST PER ASTM B117. ZINC-PLATED FASTENERS DO NOT COMPLY WITH THIS REQUIREMENT.
4. STEEL FABRICATION SHALL COMPLY WITH LATEST AISC SPECIFICATIONS.
5. HOLLOW STRUCTURAL STEEL (HSS) MEMBERS SHALL BE ASTM A1085 GRADE 50 UNLESS NOTED OTHERWISE. ASTM A1085 STEEL HAS THE SAME OR BETTER PROPERTIES AND WELDABILITY THAN ASTM A500 GRADE B.
6. HOT ROLLED WIDE FLANGE STEEL SECTIONS SHALL BE ASTM A992, F_y= 50 KSI.
7. COLD FORMED STEEL (CFS) PURLINS SHALL BE ASTM A653 SS GRADE 55 (F_y=55 ksi, F_u=70 ksi) OR ASTM A1011 SS GRADE 55 (F_y=55 KSI, F_u=70 ksi)..
8. STRUCTURAL STEEL SHALL BE HOT-DIP GALVANIZED (MINIMUM ASTM A123 OR A153 CLASS D, AS APPLICABLE) OR PAINTED WITH ZINC-RICH PRIMER, UNDERCOAT, AND FINISH COAT; OR EQUIVALENT PAINT SYSTEM. COLD-FORMED STEEL MEMBERS SHALL BE 55 PERCENT ALUMINUM-ZINC ALLOY COATED PER ASTM A792/A792M STANDARD IN ACCORDANCE TO AISI S240 TABLE A4-1, CP 90 COATING DESIGNATION.
9. BOLTS SHALL CONFORM TO THE ASTM A307 SPECIFICATIONS UNLESS NOTED OTHERWISE. INSPECTIONS ARE REQUIRED FOR ASTM VERIFICATION AND INSTALLATION. A307 BOLTS ARE NOT CONSIDERED HIGH STRENGTH BOLTS AND THUS HIGH STRENGTH BOLT TESTING IS NOT REQUIRED.
10. ASTM A307 BOLTS MAY BE SUBSTITUTED WITH THE SAME NUMBER AND SIZE OF SAE J429 GRADE 2 BOLTS.
11. BOLTS SHALL BE TIGHTENED TO SNUG-TIGHT CONDITION UNLESS NOTED OTHERWISE EXCEPT FOR A325-SC HIGH STRENGTH BOLTS.
12. A325-SC BOLTS SHALL BE PRE-TENSIONED PER AISC SPECIFICATIONS USING APPROVED LOAD INDICATOR METHODS INCLUDING BUT NOT LIMITED TO TURN-OF-THE NUT WITH MATCH MARKING, TWIST OFF TENSION CONTROL OR DIRECT TENSION INDICATOR BOLT BUT AND WASHER ASSEMBLIES.
13. BOLTS SHALL HAVE STANDARD WASHERS UNDER THE NUT & BOLT HEAD (F436 WASHERS NOT REQUIRED). STANDARD WASHERS DO NOT REQUIRE HARDNESS TEST.
14. STANDARD ROUND BOLT HOLES MAY BE USED WHERE SHORT HORIZONTALLY SLOTTED BOLT HOLES ARE SHOWN.
15. HOLES FOR 1/2" DIAMETER BOLTS SHALL BE STANDARD HOLES 9/16" Ø TYPICAL U.N.O.
16. ALL BOLTS SHALL BE PROVIDED WITH METHOD TO PREVENT NUTS FROM LOOSING. SAMPLE ACCEPTABLE METHODS ARE; LOCK WASHERS, NYLOCK NUT, SERRATED NUTS (IF NO WASHERS USED). ONLY ONE METHOD IS REQUIRED. CONTRACTOR TO IDENTIFY WHICH METHOD IS USED IN ALL SUBMITTALS TO THE DESIGN PROFESSIONAL IN GENERAL RESPONSIBLE CHARGE.
17. STRUCTURAL STEEL PLATES SHALL BE ASTM A572 GRADE 50 UNLESS NOTED OTHERWISE.

SPECIAL INSPECTION

1. SOILS
   - VERIFY THE SITE HAS BEEN PREPARED PROPERLY PRIOR TO PLACEMENT OF CONTROLLED FILL AND/OR EXCAVATIONS FOR FOUNDATIONS.
   - VERIFY THAT THE FOUNDATION EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL.
   - VERIFY THAT MATERIALS BELOW FOOTINGS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY.
2. DRILLED CONCRETE PIER FOUNDATIONS
   - INSPECT DRILLING OPERATIONS AND MAINTAIN COMPLETE AND ACCURATE RECORDS FOR EACH PIER.
   - VERIFY LOCATIONS OF PIERS.
3. CONCRETE
   - VERIFY USE OF REQUIRED DESIGN MIX, DETERMINE THE TEMPERATURE OF THE CONCRETE, AND (WHERE REQUIRED) PERFORM AIR CONTENT TEST.
   - TEST CONCRETE (COMPRESSION TEST).
   - INSPECT PLACEMENT OF FORM WORK, REINFORCING STEEL, EMBED ITEMS, AND CONCRETE. INSPECT CURING AND FORM REMOVAL.
   - SLUMP TEST SHALL BE PERFORMED PER SITE SPECIFIC DSA-103
4. STRUCTURAL STEEL
   - VERIFY THAT ALL MATERIALS ARE APPROPRIATELY MARKED AND THAT:
     a. MILL CERTIFICATES INDICATE MATERIAL PROPERTIES THAT COMPLY WITH REQUIREMENTS.
     b. MATERIAL SIZES, TYPES AND GRADES COMPLY WITH REQUIREMENTS.
   - TEST UNIDENTIFIED MATERIALS.
   - HIGH STRENGTH PRE-TENSIONED SLIP CRITICAL BOLTING.
   - VERIFY MEMBER LOCATIONS, BRACING AND ALL DETAILS CONSTRUCTED IN THE FIELD.
   - VERIFY STIFFENER LOCATIONS, CONNECTION TAB LOCATIONS, AND ALL CONSTRUCTION DETAILS FABRICATED IN THE SHOP.
   - VERIFY WELD FILLER MATERIAL IDENTIFICATION MARKINGS PER AWS DESIGNATION LISTED ON THE DSA APPROVED DOCUMENTS AND THE WPS.
   - VERIFY WELD FILLER MATERIAL MANUFACTURER'S CERTIFICATE OF COMPLIANCE.
   - VERIFY WPS, WELDER QUALIFICATIONS, AND EQUIPMENT.
   - INSPECT GROOVE, MULTI-PASS, AND FILLET WELDS > 5/16" (BOTH SHOP AND FIELD WELDS).
5. SHOP FABRICATION
   - VERIFY FABRICATOR'S FABRICATION AND QUALITY CONTROL PROCEDURES.
   - VERIFY ALL ASPECTS OF SHOP FABRICATION INCLUDING MEMBER LOCATIONS, DIMENSIONAL LAYOUT OF ALL PARTS , BOLTING, ETC.
6. REFER TO DSA APPROVED FORM 103 FOR ADDITIONAL REQUIREMENTS.

GENERAL NOTES

1. DESIGN PER 2022 C.B.C. AND ITS PRESCRIBED LOADING AND MATERIAL SPECIFICATIONS:
   - ASCE 7-16
   - 15TH EDITION AISC STEEL CONSTRUCTION MANUAL
   - 2016 AISI COLD FORMED STEEL STANDARD
   - ACI 318-19
   - AISC 341-16
2. THE PC STRUCTURES ARE NOT DESIGNED TO BE, NOR SHALL THEY BE, ENCLOSED.
3. ALL DIMENSIONS, CONDITIONS, AND ELEVATIONS ARE TO BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO COMMENCING WORK OR FABRICATION. IF ANY DISCREPANCIES ARE FOUND OR IF ANY CONDITION EXISTS NOT AS SHOWN ON THE DRAWINGS THE DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE SHALL BE NOTIFIED IMMEDIATELY.
4. OWNER TO SIGN AUTHORIZATION TO PROCEED PRIOR TO DRILLING.
   SEE EXAMPLE BELOW:

M BAR C CONSTRUCTION
"THE STRENGTH BETWEEN SUN AND SHADE"
674 Rancheros Drive
San Marcos, CA 92069
PH: 760.744.4131
FAX: 760.744.4449
CA LIC #869960

Authorization to Proceed

Project Name: _____ Foreman: _____
Site Name: _____ Contractor: _____

As an authorized representative of Contractor listed above, I,_____ agree to the following statements below:

_____(initial) **LAYOUT:** The onsite layout for installation of structural steel for carports and canopies has been inspected and is approved as is.

_____(initial) **ARRAY ORIENTATION/CONCRETE POUR:** The tilt and direction of the canopies have been verified and are approved as is.

ARRAYS:

_____
_____
_____
_____
_____

It is understood that additional costs will apply due to the following delays: re-layout not due to M Bar C, underground site conflicts (unmarked utility lines, including but not limited to water, sewer, fire, irrigation, electrical; encountered underground water; change in soils condition, including but not limited to hard drilling, caving soils, obstructions).

BY: _____ DATE: _____
(signature)

www.mbarconline.com

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 04-125584 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 09/01/2026

4 STEL ENGINEERING
26030 ACERO,
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M BAR C CONSTRUCTION INC.
1770 LA COSTA MEADOWS DRIVE
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(775) 787-8845

ENGINEER'S APPROVAL

REGISTERED PROFESSIONAL ENGINEER DUSTIN K. ROSEMAN S 5885 CIVIL STATE OF CALIFORNIA

BID INFORMATION
THE STRUCTURES AND DESIGNS IN THIS PC ARE PROPRIETARY TO M BAR C CONSTRUCTION, INC. AND 4 S.T.E.L. ENGINEERING, INC. ALL SITES USING THIS PC: M BAR C CONSTRUCTION, INC. SHALL BE THE STEEL CONTRACTOR & 4 S.T.E.L. ENGINEERING, INC. SHALL BE THE SEOR. SEE THE STANDARD NOTES FOR PC USE ON S-1 FOR ADDITIONAL REQUIREMENTS.

PRE-CHECK (PC) DOCUMENT
CODE: 2022 CBC
A SEPARATE PROJECT APPLICATION FOR CONSTRUCTION IS REQUIRED

~~APPROVED
DIV. OF THE STATE ARCHITECT
APP: 04-122015 PC
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑ CG ☐
DATE: 11/09/2023~~

SITE SPECIFIC INFORMATION

REVISIONS

MARK	DATE	DESCRIPTION

4 STEL JOB #	MC05-02-1
DATE	11-01-23
DRAWN BY	NML
CHECKED	CDL

GENERAL NOTES

S-3

NOTE: IF DWG. IS NOT 24 x 36, IT IS NOT FULL SIZE

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS, 2022 CBC

Application Number: 04-122015	**School Name:** M Bar C Inc Multipurpose Canopy 22 PC	**School District:** N/A
DSA File Number:	**Increment Number:**	**Date Created:** 2023-11-08 15:50:31

2022 CBC

IMPORTANT: This form is only a summary list of structural tests and some of the special inspections required for the project. Generally, the structural tests and special inspections noted on this form are those that will be performed by the Geotechnical Engineer of Record, Laboratory of Record, or Special Inspector. The actual complete test and inspection program must be performed as detailed on the DSA approved documents. The appendix at the bottom of this form identifies work NOT subject to DSA requirements for special inspection or structural testing. The project inspector is responsible for providing inspection of all facets of construction, including but not limited to, special inspections not listed on this form such as structural wood framing, high-load wood diaphragms, cold-formed steel framing, anchorage of non-structural components, etc., per Title 24, Part 2, Chapter 17A (2022 CBC).

****NOTE:** Undefined section and table references found in this document are from the CBC, or California Building Code.

Geotechnical Reports: Project has a geotechnical report, or CDs indicate soils special inspection is required by GE

	S1. GENERAL:			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☑	**a.** 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.	**Periodic**	**GE***	* By geotechnical engineer or his or her qualified representative. (See Appendix (end of this form) form for exemptions.)

	C1. CAST-IN-PLACE CONCRETE			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☑	**a.** Verify use of required design mix.	**Periodic**	**SI**	**Table 1705A.3 Item 5, 1910A.1.**
☑	**b.** Identifiy, sample, and test reinforcing steel.	**Test**	**LOR**	**1910A.2;** ACI 318-19 Ch.20 and Section 26.6.1.2; DSA IR 17-10. (See Appendix (end of this form) for exemptions.)
☑	**c.** During concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	**Test**	**LOR**	**Table 1705A.3 Item 6**; ACI 318-19 Sections 26.5 & 26.12.
☑	**d.** Test concrete (f'_c).	**Test**	**LOR**	**1905A.1.17;** ACI 318-19 Section 26.12.
☑	**e.** Batch plant inspection: **Periodic**	**See Notes**	**SI**	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 eliminated per **1705A.3.3.2.** See IR 17-13. (See Appendix (end of this form) for exemptions.)

	S/A1. STRUCTURAL STEEL, COLD-FORMED STEEL AND ALUMINUM USED FOR STRUCTURAL PURPOSES			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☑	**a.** Verify identification of all materials and: • Mill certificates indicate material properties that comply with requirements. • Material sizes, types and grades comply with requirements.	**Periodic**	*	**Table 1705A.2.1 Item 3a–3c.** 2202A.1; AISI S100-20 Section A3.1 & A3.2, AISI S240-20 Section A3 & A5, AISI S220-20 Sections A4 & A6. * By special inspector or qualified technician when performed off-site.
☑	**b.** Test unidentified materials	**Test**	**LOR**	**2202A.1.**
☑	**c.** Examine seam welds of HSS shapes	**Periodic**	**SI**	DSA IR 17-3.
☑	**d.** Verify and document steel fabrication per DSA-approved construction documents.	**Periodic**	**SI**	Not applicable to cold-formed steel light-frame construction, except for trusses (**1705A.2.4**).

	S/A2. HIGH-STRENGTH BOLTS:			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☑	**a.** Verify identification markings and manufacturer's certificates of compliance conform to ASTM standards specified in the DSA-approved documents.	**Periodic**	**SI**	**Table 1705A.2.1 Items 1a & 1b, 2202A.1;** AISC 360-16 Section A3.3, J3.1, and N3.2; RCSC 2014 Section 1.5 & 2.1; DSA IR 17-8 & DSA IR 17-9.
☑	**b.** Test high-strength bolts, nuts and washers.	**Test**	**LOR**	**Table 1705A.2.1 Item 1c, 2213A.1**; RCSC 2014 Section 7.2; DSA IR 17-8.
☑	**d.** Pretensioned and slip-critical connections.	*	**SI**	**Table 1705A.2.1 Items 2b & 2c, 1705A.2.6, 2204A.2;** AISC 360-16 J3.1, J3.2, M2.5 & N5.6; RCSC 2014 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	**Type**	**Performed By**	**Code References and Notes**
☑	**a.** Verify weld filler material identification markings per AWS designation listed on the DSA-approved documents and the WPS.	**Periodic**	**SI**	**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.
☑	**b.** Verify weld filler material manufacturer's certificate of compliance.	**Periodic**	**SI**	DSA IR 17-3.
☑	**c.** Verify WPS, welder qualifications and equipment.	**Periodic**	**SI**	DSA IR 17-3.

	S/A4. SHOP WELDING (IN ADDITION TO SECTION S/A3):			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☑	**a.** Inspect groove welds, multi-pass fillet welds, single pass fillet welds > 5/16", plug and slot welds.	**Continuous**	**SI**	**Table 1705A.2.1 Items 5a.1–4;** AISC 360-16 (and AISC 341-16 as applicable); DSA IR 17-3.
☑	**b.** Inspect single-pass fillet welds ≤ 5/16", floor and roof deck welds.	**Periodic**	**SI**	**1705A.2.2, Table 1705A.2.1 Items 5a.5 & 5a.6;** AISC 360-16 (and AISC 341-16 as applicable); DSA IR 17-3.

	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
	S/A5. FIELD WELDING (IN ADDITION TO SECTION S/A3):			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☑	**a.** Inspect groove welds, multi-pass fillet welds, single pass fillet welds > 5/16", plug and slot welds.	**Continuous**	**SI**	**Table 1705A.2.1 Items 5a.1–4;** AISC 360-16 (AISC 341-16 as applicable); DSA IR 17-3.
☑	**b.** Inspect single-pass fillet welds ≤ 5/16".	**Periodic**	**SI**	**Table 1705A.2.1 Item 5a.5;** AISC 360-16 (AISC 341-16 as applicable); DSA IR 17-3.

	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
	S/A6. NONDESTRUCTIVE TESTING:			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☑	**a.** Ultrasonic	**Test**	**LOR**	**1705A.2.1, 1705A.2.5;** AISC 341-16 J6.2, AISC 360-16 N5.5; AWS D1.1, AWS D1.8; DSA IR 17-2.
☑	**b.** Magnetic Particle	**Test**	**LOR**	**1705A.2.1, 1705A.2.5;** AISC 341-16 J6.2, AISC 360-16 N5.5; AWS D1.1, AWS D1.8; DSA IR 17-2.

1. Soils Testing and Inspection: Geotechnical Verified Report Form DSA 293
2. Structural Testing and Inspection: Laboratory Verified Report Form DSA 291
3. Concrete Batch Plant Inspection: Laboratory Verified Report Form DSA 291
4. Shop Welding Inspection: Laboratory Verified Report Form DSA 291, or, for independently contracting SI, Special Inspection Verified Report Form DSA 292
5. Field Welding Inspection: Laboratory Verified Report Form DSA 291, or, for independently contracting SI, Special Inspection Verified Report Form DSA 292
6. High-Strength Bolt Installation Inspection: Laboratory Verified Report Form DSA 291, or, for independently contracting SI, Special Inspection Verified Report Form DSA 292

1 / - SAMPLE DSA 103 - STRUCTURES WITH PIER OR SPREAD FOUNDATIONS

THE EXAMPLE DSA-103 FORMS SHOWN ON THIS SHEET ARE GUIDES ONLY FOR COMPLETING PROJECT SPECIFIC DSA-103 FORMS. FORM DSA-103 IS REQUIRED TO BE COMPLETED FOR EACH DSA APPLICATION THAT INCORPORATES THE PC AND ALL EXAMPLE DSA-103 FORMS ARE TO BE VOIDED ON THIS SHEET.

IDENTIFICATION STAMP
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APP: 04-125584 INC:
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SS ☑ FLS ☑ ACS ☑
DATE: 09/01/2026

4 STEL ENGINEERING
26030 ACERO,
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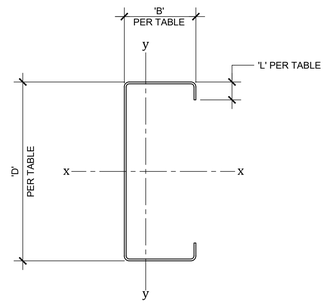
EXAMPLE DSA-103 FORMS

S-4

SECTION NAME	GA	D (in)	B (in)	L (in)	WT (lb/ft)	A (in^2)	AXIS X-X			AXIS Y-Y		
							I_x (in^4)	S_x (in^3)	r_x (in)	I_y (in^4)	$S_y^{(min)}$ (in^3)	r_y (in)
C 10 x 4 x 0.071	14	10	4	1.0	4.72	1.388	21.96	3.424	3.977	3.009	1.086	1.472

NOTES

1. COLD FORMED STEEL (CFS) PURLINS AND BEAMS MATERIAL SHALL CONFORM TO ASTM A653 SS GRADE 55 (F_Y = 55 KSI, F_U = 70 KSI) OR ASTM A1011 SS GRADE 55 (F_Y = 55 KSI,
2. COLD FORMED STEEL (CFS) DESIGNED PER 2016 AISI SPECIFICATIONS AND AISI COLD-FORMED STEEL DESIGN MANUAL.
3. CFS SECTION PROPERTIES LISTED ABOVE ARE MINIMUM SECTION PROPERTIES REQUIRED PER THE LATEST STEEL FRAMING INDUSTRY ASSOCIATION (SFIA) PRODUCT TECHNICAL GUIDE. ACTUAL MANUFACTURER'S PROPERTIES MUST MEET OR EXCEED SFIA PROPERTIES.



4 - PURLINS

N.T.S.

SECTION NAME	D (in)	B (in)	t_w (in)	t_f (in)	WT (lb/ft)	A (in^2)	AXIS X-X			AXIS Y-Y		
							I_x (in^4)	S_x (in^3)	r_x (in)	I_y (in^4)	S_y (in^3)	r_y (in)
[x] W12 x 40	11.9	8.01	0.295	0.515	40	11.70	307	51.5	5.13	44.1	11.0	1.94
[ ] W12 x 72	12.3	12	0.43	0.67	72	21.1	597	97.4	5.31	195	32.4	3.05

NOTES

1. WF BEAMS SHALL CONFORM TO ASTM A992, F_y = 50 ksi.

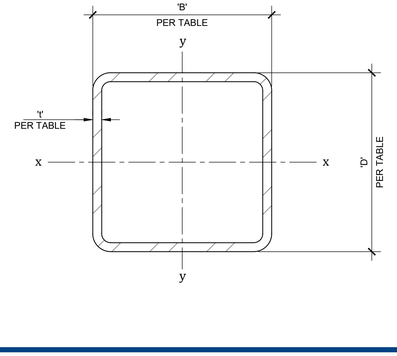
5 - BEAMS

N.T.S.

	SECTION NAME	D (in)	B (in)	t (in)	WT (lb/ft)	A (in^2)	AXIS X-X			AXIS Y-Y		
							I_x (in^4)	S_x (in^3)	r_x (in)	I_y (in^4)	S_y (in^3)	r_y (in)
[x]	HSS 10 x 10 x ¼	10	10	0.25	32.63	9.59	151	30.2	3.97	151	30.2	3.97
[ ]	HSS 10 x 10 x 5/16	10	10	0.3125	40.35	11.90	184	36.8	3.93	184	36.8	3.93
[ ]	HSS 12 x 12 x ⅜	12	12	0.375	58.10	17.10	380	63.3	4.71	380	63.3	4.71
[ ]	HSS 12 x 12 x ½	12	12	0.500	76.07	22.40	486	81.0	4.66	486	81.0	4.66

NOTES

1. HSS COLUMNS SHALL CONFORM TO ASTM A1085, F_y = 50 ksi.



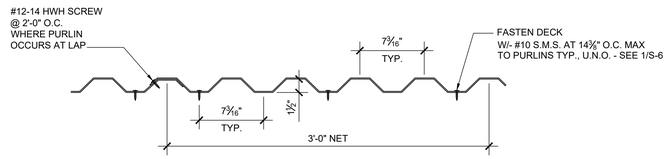
6 - COLUMNS

N.T.S.

ROOF DECK SPECIFICATIONS						
SECTION PROPERTIES			TOP IN COMPRESSION		BOTTOM IN COMPRESSION	
GA	F_y (ksi)	WEIGHT (psf)	I_x+ ($in.^4$/ft.)	S_x+ ($in.^3$/ft.)	I_x- ($in.^4$/ft.)	S_x- ($in.^3$/ft.)
26	80	0.93	0.0613	0.0676	0.0577	0.0575

NOTES:

1. MATERIAL AND SECTION PROPERTIES LISTED ABOVE ARE MINIMUM REQUIRED VALUES FOR METAL DECK BASED ON MCELROY MEGARIB 26 GA.
2. METAL ROOF DECK SHALL BE CLASS A PER CBC CHAPTERS 7A AND 15.
3. ACTUAL MANUFACTURER'S PROPERTIES MUST MEET OR EXCEED MCELROY STANDARD PROPERTIES.



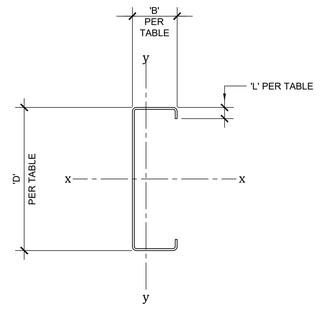
1 - DECK DETAIL

N.T.S.

SECTION NAME	GA	D (in)	B (in)	L (in)	WT (lb/ft)	A (in^2)	AXIS X-X			AXIS Y-Y		
							I_X (in^4)	S_{XE} (in^3)	r_X (in)	I_y (in^4)	S_y (in^3)	r_y (in)
CS7 x 2.5 x 0.057	16	7	2.5	0.625	2.471	0.726	5.462	1.288	2.743	0.590	0.334	0.902

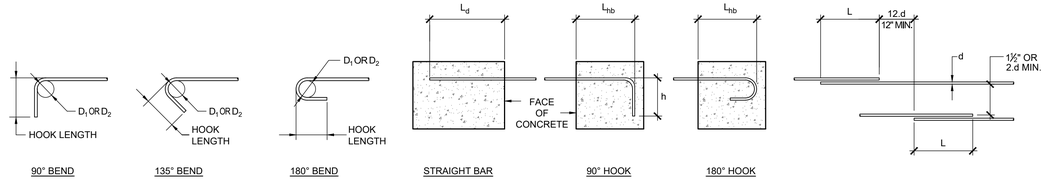
NOTES

1. COLD FORMED STEEL (CFS) PURLINS AND BEAMS MATERIAL SHALL CONFORM TO ASTM A653 SS GRADE 55 (F_y = 55 KSI, F_u = 70 KSI) OR ASTM A1011 SS GRADE 55 (F_y = 55 KSI, F_u = 70 KSI).
2. COLD FORMED STEEL (CFS) DESIGNED PER 2016 AISI SPECIFICATIONS AND COLD-FORMED STEEL DESIGN MANUAL.
3. CFS SECTION PROPERTIES LISTED ABOVE ARE MINIMUM SECTION PROPERTIES REQUIRED PER THE LATEST STEEL FRAMING INDUSTRY ASSOCIATION (SFIA) PRODUCT TECHNICAL GUIDE. ACTUAL MANUFACTURER'S PROPERTIES MUST MEET OR EXCEED SFIA PROPERTIES.



2 - PURLIN BLOCKING

N.T.S.



FINISHED BEND DIAMETERS		
BAR SIZE	D_1	D_2
#3	1½"	2¼"
#4	2"	3"
#5	2½"	3¾"
#6, #7, #8	6.d	6.d

"D_1" - FINISHED BEND DIA. FOR STIRRUP & TIE HOOKS.

"D_2" - BEND DIA. FOR STD HOOKS.

"d" - BAR DIAMETER

STANDARD HOOK LENGTHS				
BAR SIZE	MAIN REINFT.		STIRRUP & TIE HOOKS	
	90°	180°	90°	135°
#3	6"	4"	3½"	4¼"
#4	8"	4½"	4½"	4½"
#5	10"	5"	6"	6"
#6	12"	6"	12"	7½"
#7	14"	7"	14"	9"
#8	16"	8"	16"	10"

REINFORCEMENT DEVELOPMENT LENGTHS				
CONCRETE STRENGTH		F'C = 3,000 PSI		
NOMINAL BAR SIZE	h	L_d		L_{hb}
		TOP BARS	OTHER BARS	
#3	6"	1'-10"	1'-5"	9"
#4	8"	2'-5"	1'-10"	11"
#5	10"	3'-0"	2'-4"	1'-2"
#6	1'-0"	3'-7"	2'-9"	1'-5"
#7	1'-2"	5'-3"	4'-0"	1'-7"
#8	1'-4"	6'-0"	4'-7"	1'-10"

NOTES:

1. TOP BARS ARE HORIZONTAL BARS WITH MORE THAN 12 INCHES OF CONCRETE CAST BELOW.

REINFORCEMENT LAP SPLICE LENGTH 'L'		
CONCRETE STRENGTH	F'C=3,000 PSI	
NOMINAL BAR SIZE	TOP BARS	OTHER BARS
#3	2'-4"	1'-10"
#4	3'-2"	2'-5"
#5	3'-11"	3'-0"
#6	4'-8"	3'-7"
#7	6'-9"	5'-3"
#8	7'-9"	6'-0"

NOTES:

1. LAP SPLICE SHALL BE INCREASED 50% WHERE CLEAR SPACE BETWEEN BARS IS LESS THAN 2 BAR DIAMETERS AND/OR THE CLEAR COVER IS LESS THAN ONE BAR DIAMETER.

A - STANDARD HOOKS

B - DEVELOPMENT LENGTHS

C - OFFSETS AND LAP SPLICES

3 - TYPICAL REINFORCEMENT BAR BENDS AND LAPS

N.T.S.

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SS ☑ FLS ☑ ACS ☑
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4 STEEL ENGINEERING
26030 ACERO,
MISSION VIEJO, CA 92691
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ENGINEER'S APPROVAL

REGISTERED PROFESSIONAL ENGINEER
DUSTIN K. ROSEPINK
S 5885
CIVIL
STATE OF CALIFORNIA

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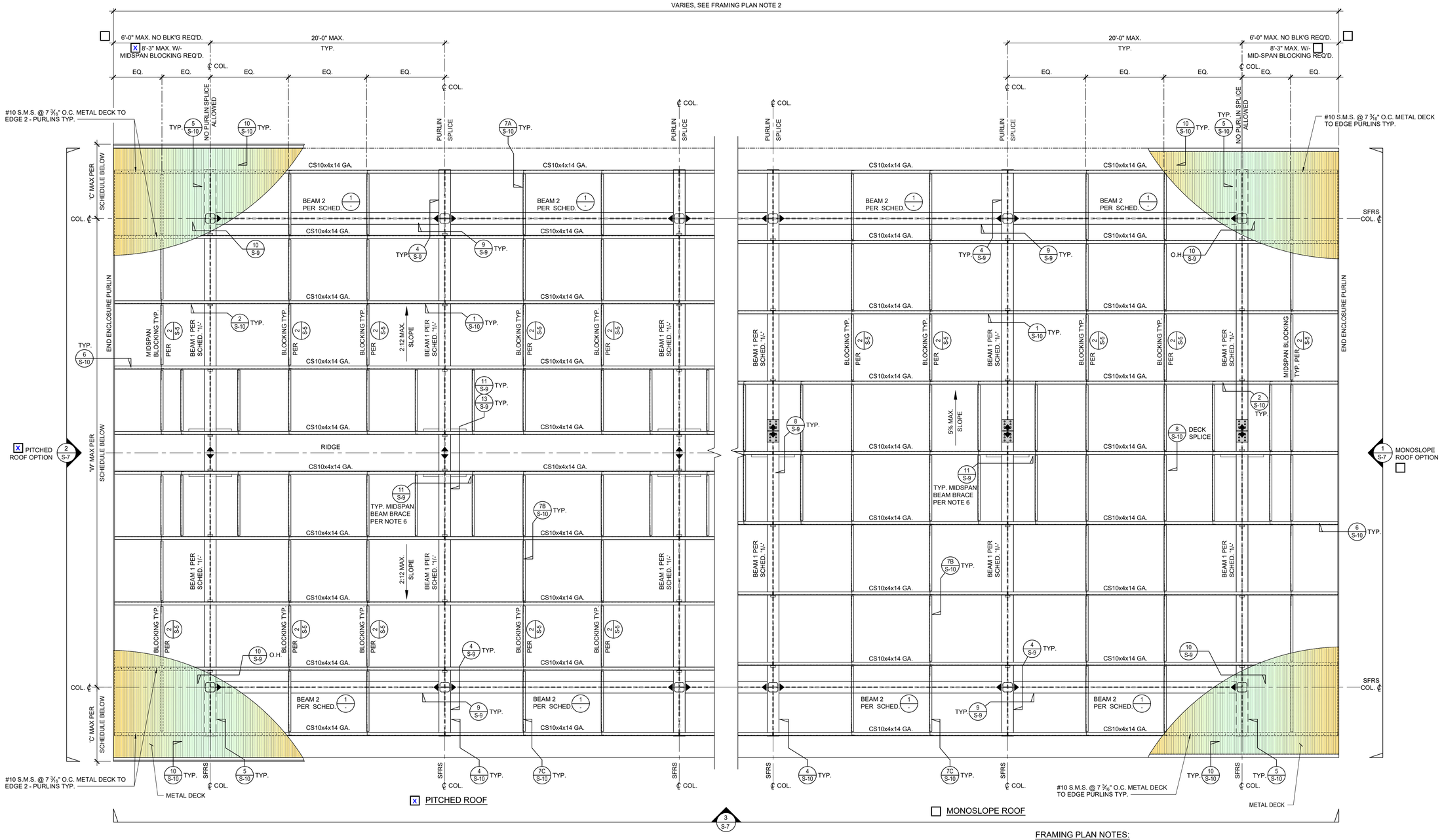
MARK	DATE	DESCRIPTION

4 STEL JOB #	MC05-02-1
DATE	11-01-23
DRAWN BY	NML
CHECKED	CDL

SECTION PROPERTIES & REBAR DETAILS

S-5

NOTE: IF DWG. IS NOT 24 x 36, IT IS NOT FULL SIZE



1 FRAMING PLAN

1/4"=1'-0"

1 BEAM & COLUMN SCHEDULE

	STRUCTURE OPTION ID#	'W' MAX.	'C' MAX.	MAX. COLUMN HEIGHT	BEAM 1 (6)	BEAM 2	COLUMN
X	M1	40'-0"	6'-0"	21'-0"	W12 x 40	W12 x 40	HSS 10 x 10 x ¼
☐	M2	40'-0"	6'-0"	23'-0"	W12 x 40	W12 x 40	HSS 10 x 10 x 5/16
☐	M3	66'-0"	10'-0"	21'-0"	W12 x 72	W12 x 72	HSS 12 x 12 x ⅜
☐	M4	66'-0"	10'-0"	23'-0"	W12 x 72	W12 x 72	HSS 12 x 12 x ½

FRAMING PLAN NOTES:

1. REFER TO SHEET 'S-2' FOR CANOPY CONSTRUCTION OPTIONS.
2. MAXIMUM CANOPY LENGTH SHALL BE SITE SPECIFIC DETERMINED TO CONFORM WITH CONSTRUCTION TYPE NOTES ON SHEET 'S-2'.
3. REFER TO SHEET S-5 FOR COLUMN, BEAM, PURLIN, AND BLOCKING SECTION PROPERTIES.
4. METAL ROOF DECK SHALL BE CLASS A PER CBC CHAPTERS 7A AND 15.
5. REFER TO DETAIL '12/S-10' FOR ALLOWABLE PURLIN PENETRATIONS.
6. BEAM MIDSPAN BRACE REQUIRED PER DETAIL '8/S-9', '11/S-9' AND '13/S-9'.
7. DECK MUST SPAN CONTINUOUSLY OVER FOUR OR MORE PURLINS WITH OR WITHOUT A CANTILEVER.
8. FASTEN DECK w/ #10 S.M.S. @ 14 3/4" O.C. TO PURLINS TYP. U.N.O.
9. PURLIN ATTACHMENT PER DETAILS 1/S-10, 2/S-10.

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ENGINEER'S APPROVAL

REGISTERED PROFESSIONAL ENGINEER DUSTIN K. ROSEPINK S 5885 STRUCTURAL

BID INFORMATION

THE STRUCTURES AND DESIGNS IN THIS PC ARE PROPRIETARY TO M BAR C CONSTRUCTION, INC. AND 4 S.T.E.L. ENGINEERING, INC. ALL SITES USING THIS PC: M BAR C CONSTRUCTION, INC. SHALL BE THE STEEL CONTRACTOR & 4 S.T.E.L. ENGINEERING, INC. SHALL BE THE SEOR. SEE THE STANDARD NOTES FOR PC USE ON S-1 FOR ADDITIONAL REQUIREMENTS.

PRE-CHECK (PC) DOCUMENT

CODE: 2022 CBC

A SEPARATE PROJECT APPLICATION FOR CONSTRUCTION IS REQUIRED

APPROVED
DIV. OF THE STATE ARCHITECT
APP: 04-122015 PC
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑ CG ☐
DATE: 11/09/2023

SITE SPECIFIC INFORMATION

REVISIONS

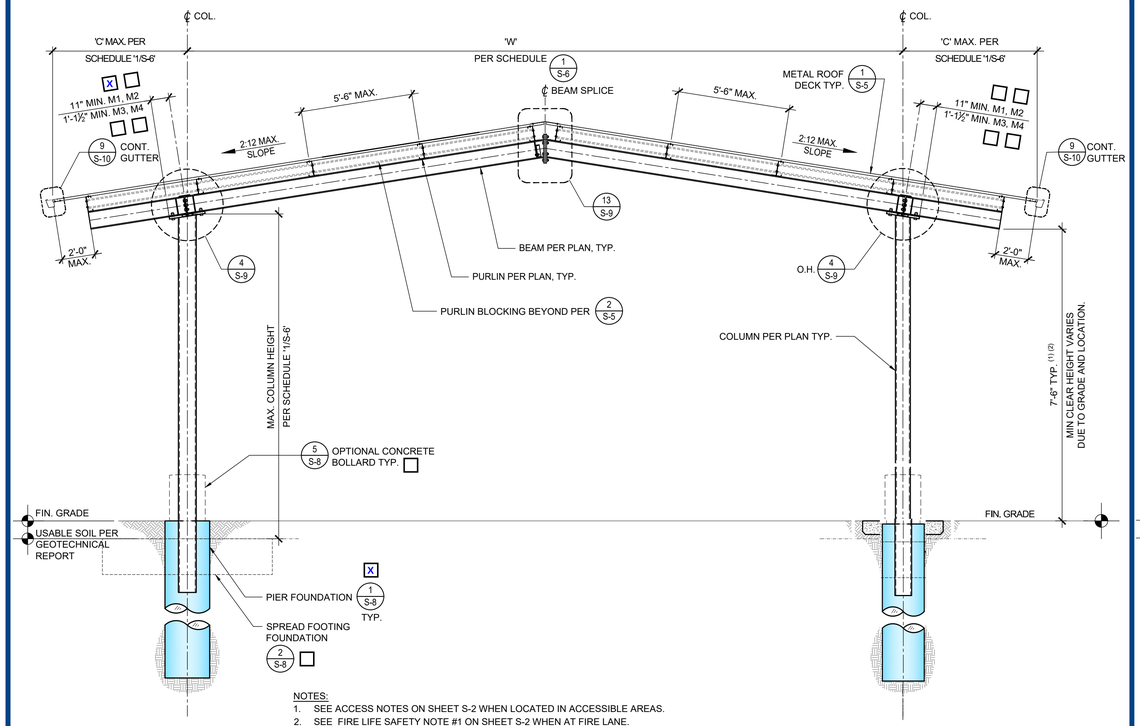
MARK	DATE	DESCRIPTION

4 STEL JOB #	MC05-02-1
DATE	11-01-23
DRAWN BY	NML
CHECKED	CDL

FRAMING PLAN

S-6

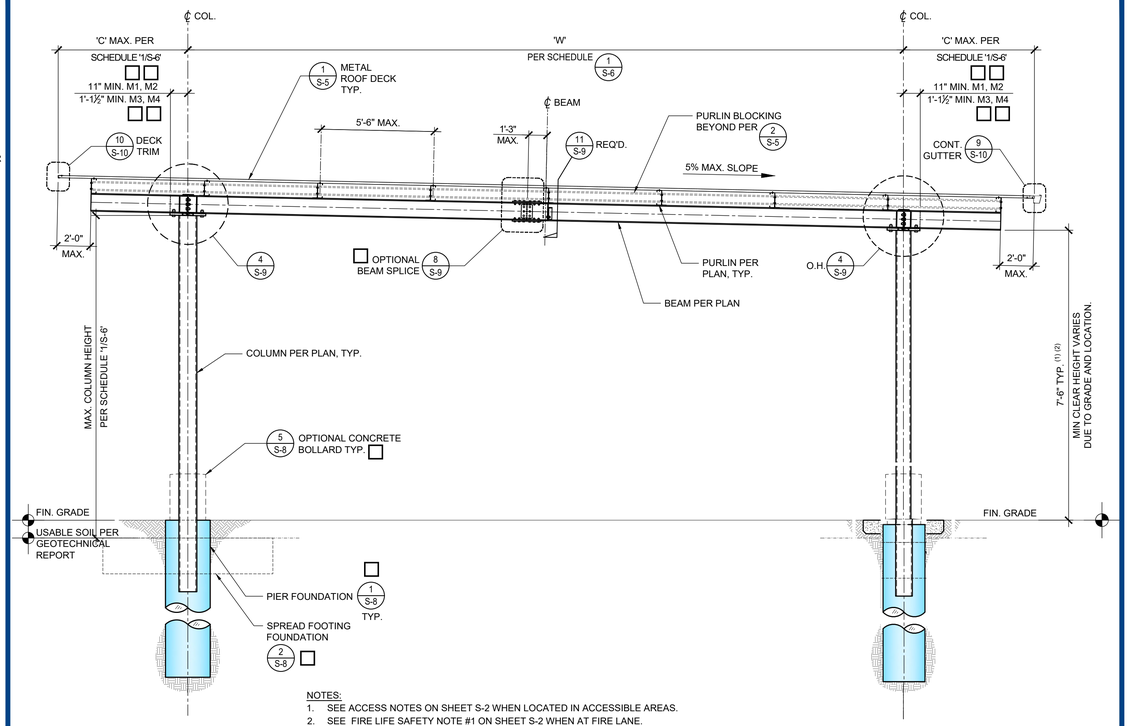
NOTE: IF DWG. IS NOT 24 x 36, IT IS NOT FULL SIZE



NOTES:
1. SEE ACCESS NOTES ON SHEET S-2 WHEN LOCATED IN ACCESSIBLE AREAS.
2. SEE FIRE LIFE SAFETY NOTE #1 ON SHEET S-2 WHEN AT FIRE LANE.

2 - END ELEVATION - PITCHED ROOF OPTION [X]

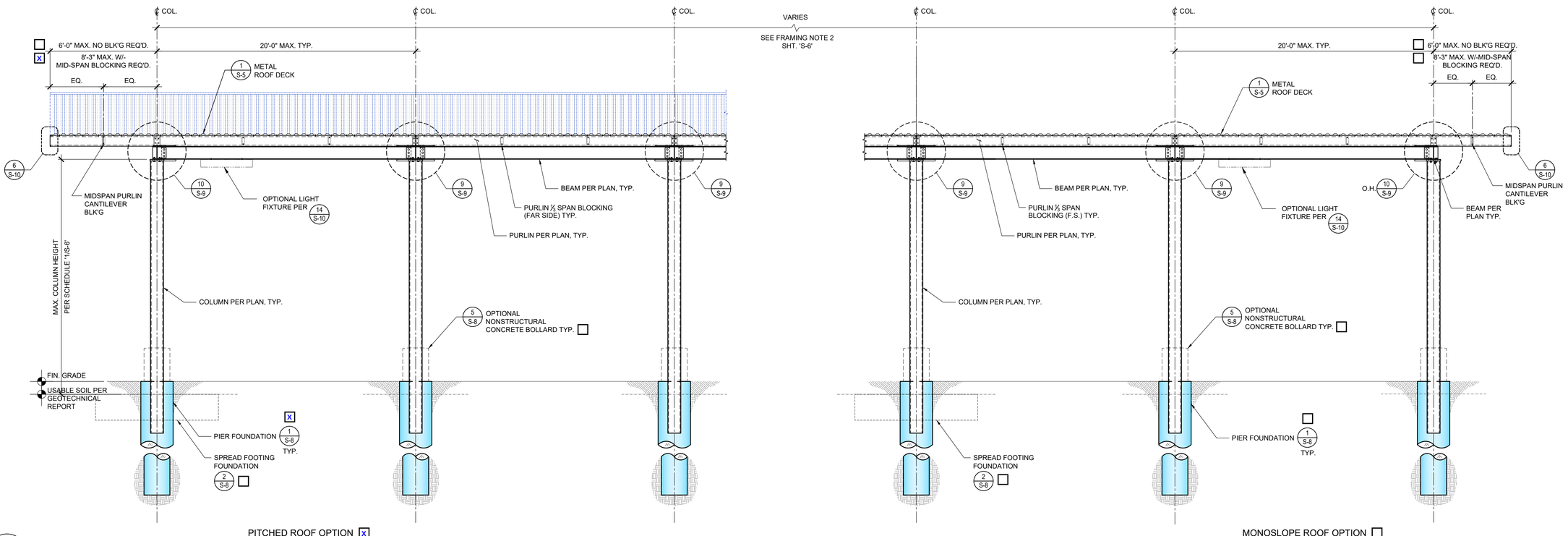
1/4"=1'-0"



NOTES:
1. SEE ACCESS NOTES ON SHEET S-2 WHEN LOCATED IN ACCESSIBLE AREAS.
2. SEE FIRE LIFE SAFETY NOTE #1 ON SHEET S-2 WHEN AT FIRE LANE.

1 - END ELEVATION - MONOSLOPE ROOF OPTION [ ]

1/4"=1'-0"



PITCHED ROOF OPTION [X]

MONOSLOPE ROOF OPTION [ ]

3 - TYPICAL SIDE ELEVATION

1/4"=1'-0"

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 04-125584 INC:
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DATE: 09/01/2026

4 STEEL ENGINEERING
26030 ACERO,
MISSION VIEJO, CA 92691
949.305.1150 | FAX 949.305.1420

M BAR C CONSTRUCTION INC.
1770 LA COSTA MEADOWS DRIVE, SAN MARCOS, CA 92078
ERIK KRIVOPOPICH
PHONE: (760) 744-4131
FAX: (760) 744-4449
ERIK@MBARCONLINE.COM
LIC # 869960 B AND C-57 (775) 787-8845

ENGINEER'S APPROVAL

REGISTERED PROFESSIONAL ENGINEER DUSTIN K. ROSENTRETER S 5885 STATE OF CALIFORNIA

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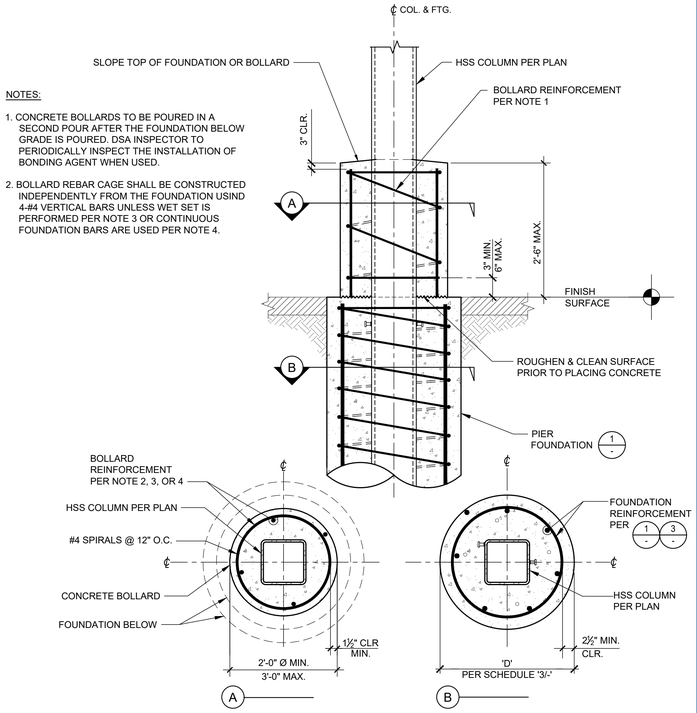
MARK	DATE	DESCRIPTION

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CHECKED	CDL

FRAMING ELEVATIONS

S-7

NOTE: IF DWG. IS NOT 24 x 36, IT IS NOT FULL SIZE



NOTES:

1. CONCRETE BOLLARDS TO BE POURED IN A SECOND POUR AFTER THE FOUNDATION BELOW GRADE IS POURED. DSA INSPECTOR TO PERIODICALLY INSPECT THE INSTALLATION OF BONDING AGENT WHEN USED.
2. BOLLARD REBAR CAGE SHALL BE CONSTRUCTED INDEPENDENTLY FROM THE FOUNDATION USIND 4-#4 VERTICAL BARS UNLESS WET SET IS PERFORMED PER NOTE 3 OR CONTINUOUS FOUNDATION BARS ARE USED PER NOTE 4.

5/- OPTIONAL NONSTRUCTURAL CONCRETE BOLLARD ☐

3/4"=1'-0"

DRILLED CONCRETE PIER FOUNDATION SCHEDULE (5, 6)

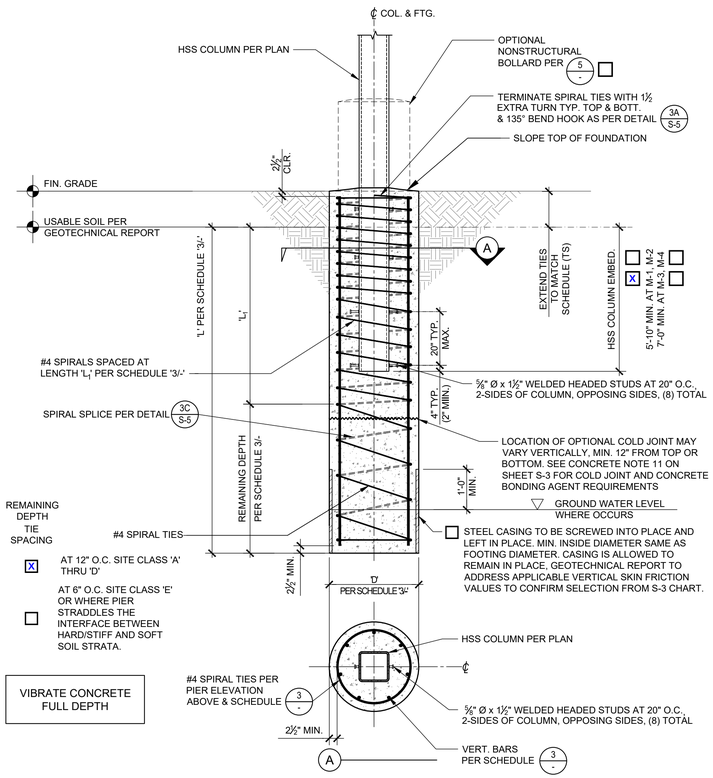
	I.D. #	DRILLED PIER DIAMETER D	DRILLED PIER DEPTH 'L' BELOW FINISH GRADE BY SOIL CLASS PER SHEET S-3 (5)					EMBEDDED COLUMN (2) VERTICAL REBAR	#4 SPIRAL TIES SPACING OVER 'L_1' SITE CLASS A-D		#4 SPIRAL TIES SPACING OVER REMAINING DEPTH	
			[X] V	☐ W	☐ X	☐ Y	☐ Z		'L_1' (3)	TIE SPACING	SITE CLASS [X] A~D	☐ E
[X]	M1	30 (in)	11' - 6"	8' - 9"	7' - 6"	6' - 9"	5' - 9"	6 - #8	7'-6"	6"	12"	6"
☐	M2	30 (in)	11' - 9"	9' - 0"	7' - 9"	7' - 0"	6' - 0"	6 - #8	7'-6"	6"	12"	6"
☐	M3	36 (in)	15' - 6"	11' - 9"	10' - 0"	9' - 0"	7' - 9"	7 - #8	9'-0"	6"	12"	6"
☐	M4	36 (in)	15' - 9"	12' - 0"	10' - 3"	9' - 3"	7' - 9"	7 - #8	9'-0"	6"	12"	6"

FOUNDATION SCHEDULE NOTES:

1. REFER TO FOUNDATION DETAILS ON THIS SHEET.
2. REINFORCING STEEL SHALL COMPLY WITH ASTM A615 GRADE 60.
[X] 3. DISTANCE 'L_1' FOR UPPER TIE SPACING DOES NOT EXCEED PIER DEPTH 'L'.
4. VERTICAL REBAR WHEN ANCHOR BOLT DETAIL 4/- IS USED.
5. MAXIMUM EMBEDMENT ALLOWED 'L':
   30 (in) = 20'-0"
   36 (in) = 24'-0"
[X] 6. WHEN NO GEOTECHNICAL REPORT IS PROVIDED USE SOIL CLASS V.

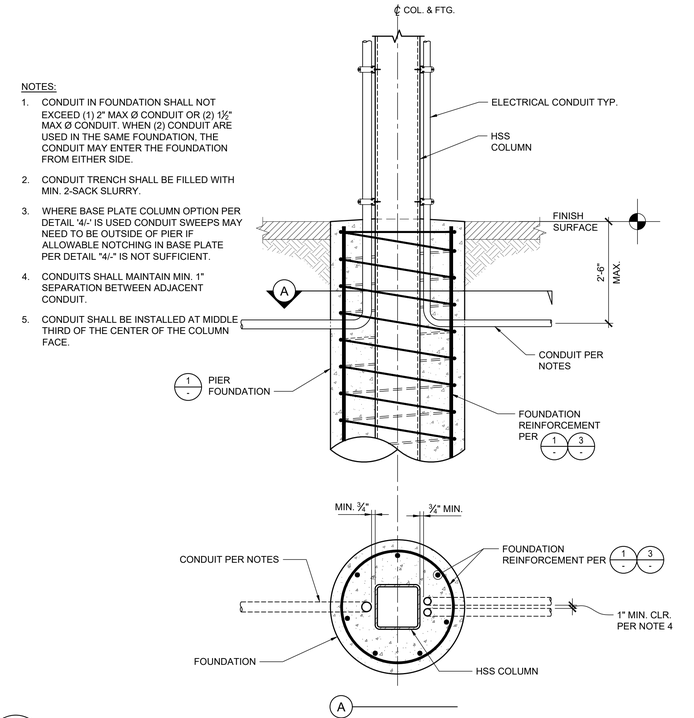
3/- DRILLED CONCRETE PIER FOUNDATION SCHEDULE ☐

NO SCALE



1/- DRILLED PIER FOUNDATION [X]

1/2"=1'-0"

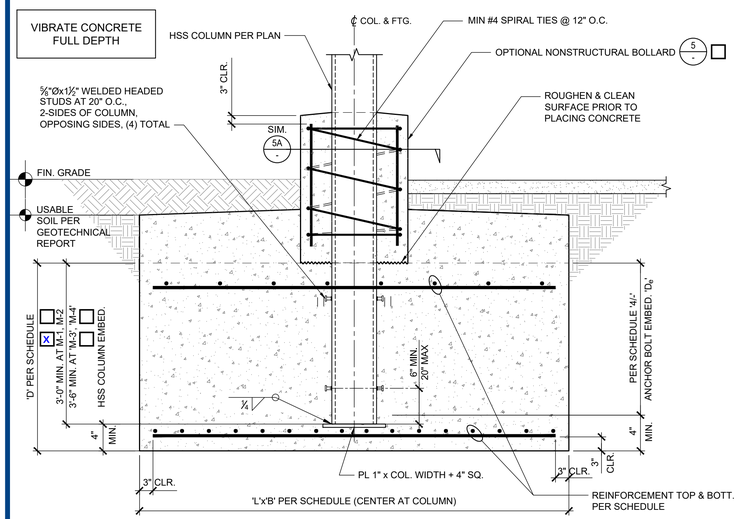


NOTES:

1. CONDUIT IN FOUNDATION SHALL NOT EXCEED (1) 2" MAX Ø CONDUIT OR (2) 1½" MAX Ø CONDUIT. WHEN (2) CONDUIT ARE USED IN THE SAME FOUNDATION, THE CONDUIT MAY ENTER THE FOUNDATION FROM EITHER SIDE.
2. CONDUIT TRENCH SHALL BE FILLED WITH MIN. 2-SACK SLURRY.
3. WHERE BASE PLATE COLUMN OPTION PER DETAIL '4/-' IS USED CONDUIT SWEEPS MAY NEED TO BE OUTSIDE OF PIER IF ALLOWABLE NOTCHING IN BASE PLATE PER DETAIL '4/-' IS NOT SUFFICIENT.
4. CONDUITS SHALL MAINTAIN MIN. 1" SEPARATION BETWEEN ADJACENT CONDUIT.
5. CONDUIT SHALL BE INSTALLED AT MIDDLE THIRD OF THE CENTER OF THE COLUMN FACE.

6/- CONDUIT IN FOUNDATION [X]

3/4"=1'-0"



ALTERNATIVE SPREAD FOOTING SCHEDULE

	ID#	'L' x 'B'	'D' (1)	REINFORCEMENT
[X]	M1, M2	7'-3" x 7'-3"	3'-6"	8 - #6 EA. WAY TOP 16 - #6 EA. WAY BOTT.
☐	M3, M4	10'-0" x 10'-0"	4'-0"	12 - #6 EA. WAY TOP 24 - #6 EA. WAY BOTT.

NOTES:

1. INCREASE FOOTING DEPTH TO PROVIDE 4" MINIMUM CONCRETE COVER BELOW BOTTOM OF EMBEDDED HSS COLUMN.

2/- ALTERNATE SPREAD FOOTING ☐

3/4"=1'-0"

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B AND C57
(760) 787-8845

ENGINEER'S APPROVAL

REGISTERED PROFESSIONAL ENGINEER DUSTIN K. ROSEPINK S 5885 STRUCTURAL CALIFORNIA

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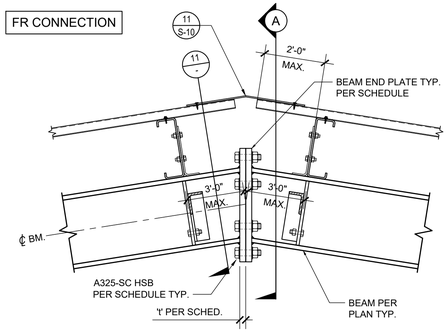
4 STEL JOB #	MC05-02-1
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FOUNDATION DETAILS

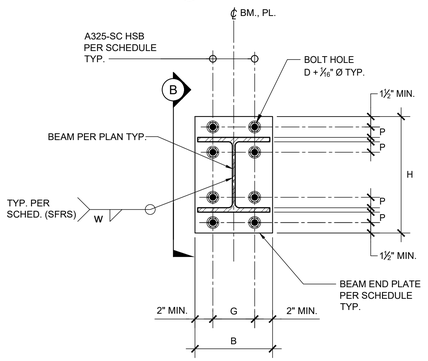
S-8

NOTE: IF DWG. IS NOT 24 x 36, IT IS NOT FULL SIZE

FR CONNECTION



B ELEVATION



A SECTION

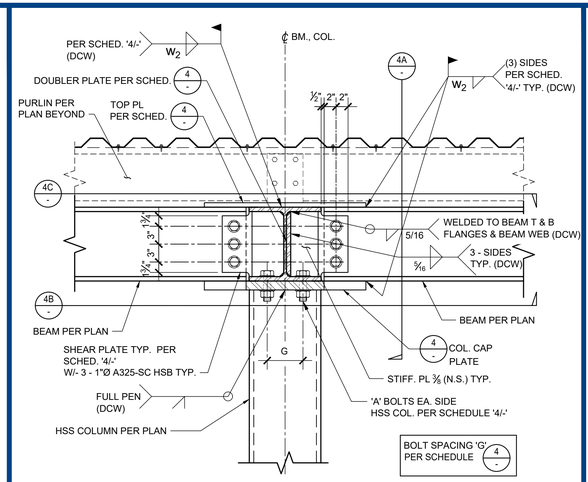
	I.D. #	CONNECTION PLATES					WELD SIZE	BOLTS
		t (in)	H (in)	B (in)	G (in)	P (in)	w (in)	TOP & BOTT. (8 BOLTS TOTAL)
X	M1, M2	¾	1'-8"	9	5	2	¼	4 - ¾" Ø A325-SC
☐	M3, M4	1	1'-8"	13	6	2	5/16	4 - 1" Ø A325-SC

NOTES:

1. BOLTS SHALL BE PRETENSIONED A325-SC (SLIP-CRITICAL) TYPE X (THREADS EXCLUDED FROM SHEAR PLANE) CLASS A FAYING SURFACE WITH STD NUTS PER ASTM A563 GRADE DH AND WASHERS PER ASTM F436 TYPICAL U.N.O.
2. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED.

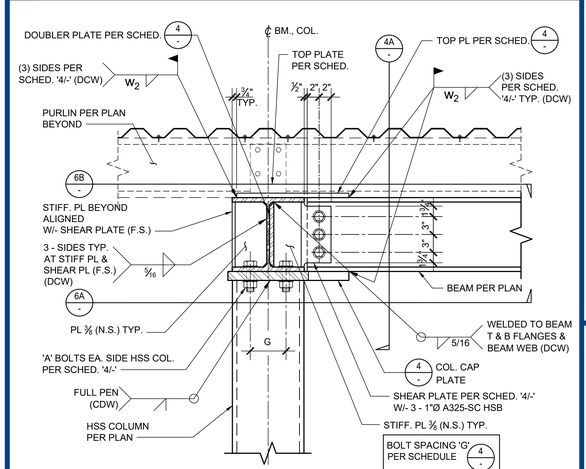
13 - PITCHED BEAM MIDSPAN SPLICE

1"=1'-0"



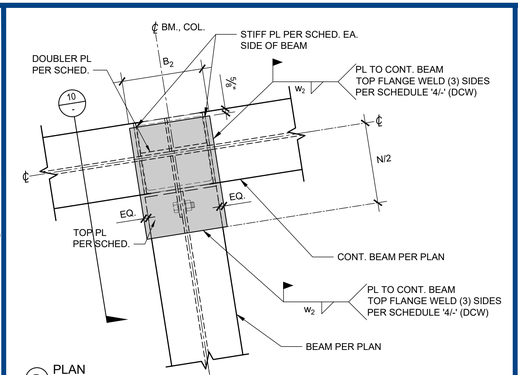
9 - BEAMS AT INTERIOR HSS COLUMN

1"=1'-0"

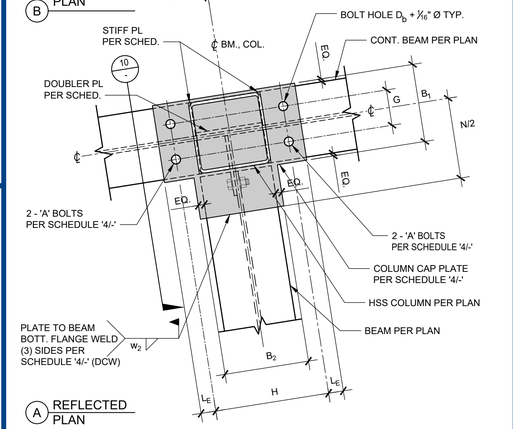


10 - BEAMS AT END HSS COLUMNS

1"=1'-0"



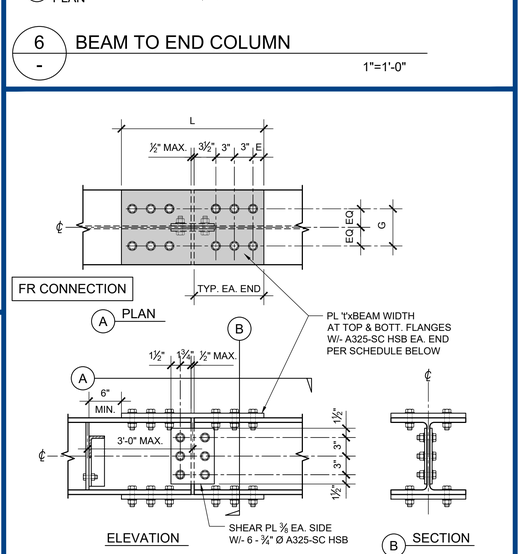
B PLAN



A REFLECTED PLAN

6 - BEAM TO END COLUMN

1"=1'-0"



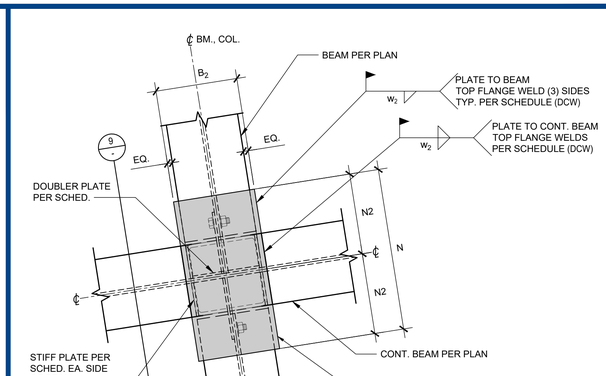
	I.D. #	TOP AND BOTTOM FLANGE PLATES				FLANGE BOLTS	
		t (in)	L (in)	E (in)	G (in)	BOLT SIZE	NO. OF A325-SC BOLTS EA. END
X	M1, M2	¾	22½	1½	5	¾	6
☐	M3, M4	1	23	1¾	6	⅞	6

NOTES:

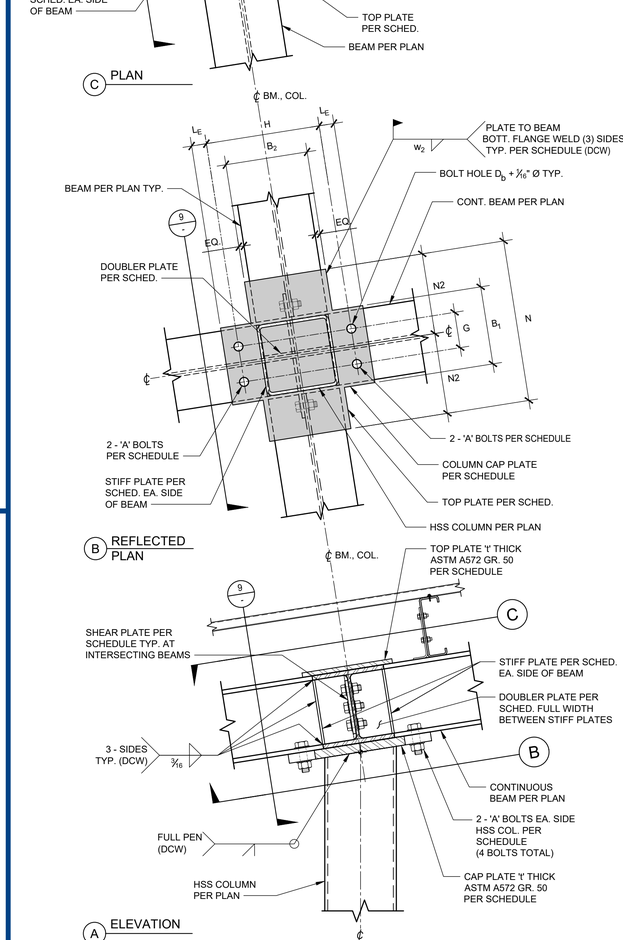
1. BOLTS SHALL BE PRETENSIONED A325-SC (SLIP-CRITICAL) TYPE X (THREADS EXCLUDED FROM SHEAR PLANE) CLASS A FAYING SURFACE WITH HEX NUTS PER ASTM A563 GRADE DH AND WASHERS PER ASTM F436 TYPICAL U.N.O.

8 - MONOSLOPE BEAM SPLICE

1"=1'-0"



C PLAN



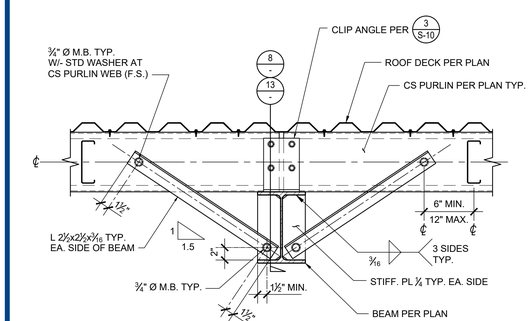
	I.D. #	COLUMN CAP & BEAM FLANGE PLATES								WELD SIZE		H.S. BOLTS (1) D_b (in)	SHEAR PLATE	TOP PLATE	DOUBLER PLATE
		t (in)	B_1 (in)	B_2 (in)	G (in)	H (in)	L_E (in)	N (in)	S (in)	w_1 (in)	w_2 (in)	'A' BOLTS	't' (in)	't' (in)	't' (in)
X	M1	1.25	11	11	5	18	2	25	4	¼	7/16	1⅛" Ø	½	¾	5/16
☐	M2	1.25	11	11	5	18	2	25	4	5/16	7/16	1⅛" Ø	½	¾	5/16
☐	M3	1.75	14	14	6	22	2.5	29.5	6	⅜	⅝	1¼" Ø	⅝	1	7/16
☐	M4	1.75	14	14	6	22	2.5	29.5	6	½	⅝	1¼" Ø	⅝	1	7/16

NOTES:

1. BOLTS SHALL BE PRETENSIONED A325-SC (SLIP-CRITICAL) TYPE X (THREADS EXCLUDED FROM SHEAR PLANE) CLASS A FAYING SURFACE WITH STANDARD NUTS PER ASTM A563 GRADE DH AND WASHERS PER ASTM F436 TYPICAL U.N.O.
2. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED.

4 - BEAM TO INTERIOR COLUMN

1"=1'-0"



11 - TYPICAL BEAM BRACE MIDSPAN

1"=1'-0"

4 STEL ENGINEERING
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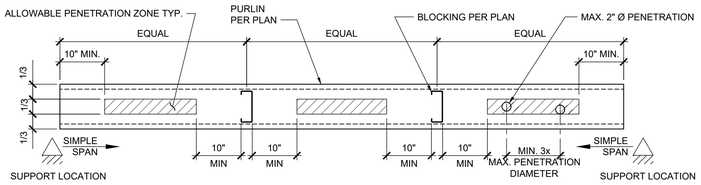
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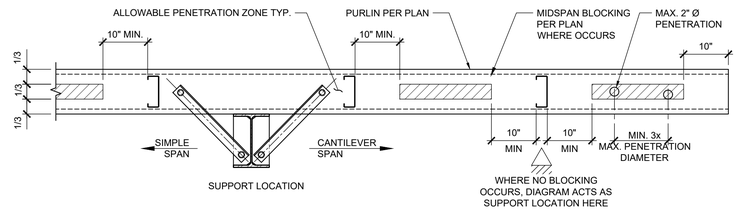
FRAMING CONNECTION DETAILS

S-9

NOTE: IF DWG. IS NOT 24 x 36, IT IS NOT FULL SIZE



SIMPLE SUPPORT SPAN

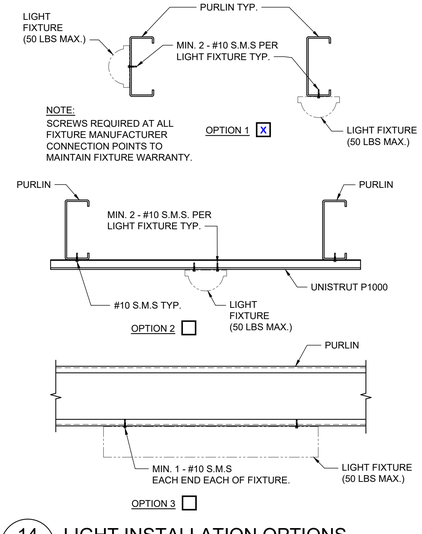


CANTILEVER SPAN

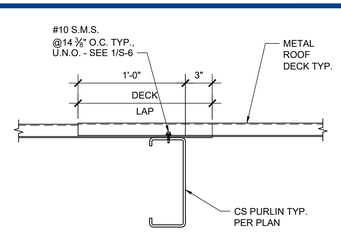
NOTE:
IF MORE THAN 5 PENETRATIONS PER SPAN ARE NEEDED, CONTRACTOR TO SUBMIT AN RFI TO DESIGN PROFESSIONAL IN GENERAL RESPONSIBLE CHARGE TO ENSURE REQUIREMENTS OF THIS DETAIL ARE MET AND TO JUSTIFY THE QUANTITY OF PENETRATIONS NEEDED. FOR PURLINS WITH ANGLE BRACING TO W-BEAMS, A MAXIMUM OF 2 PENETRATIONS IS PERMITTED, AND THERE SHALL BE 2 BLOCKINGS BETWEEN PENETRATION AND ANGLE BRACING.

12 - ALLOWABLE PURLIN PENETRATIONS
N.T.S.

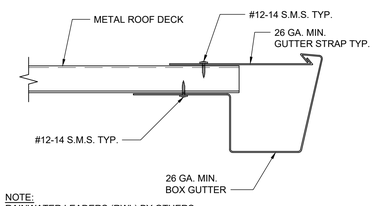
13 -



14 - LIGHT INSTALLATION OPTIONS
1"=1'-0"

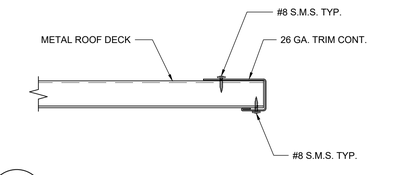


8 - ROOF DECK SPLICE
1-1/2"=1'-0"

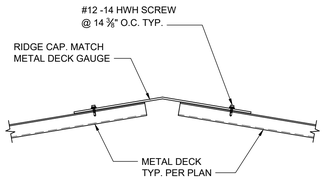


NOTE:
RAINWATER LEADERS (RWL) BY OTHERS

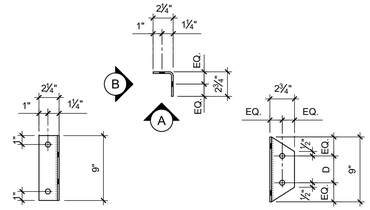
9 - ROOF DECK GUTTER X
3"=1'-0"



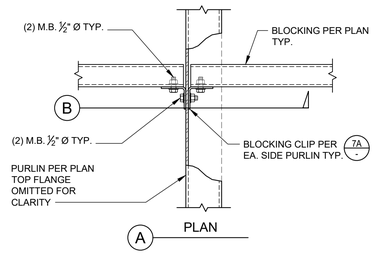
10 - ROOF DECK EDGE TRIM
3"=1'-0"



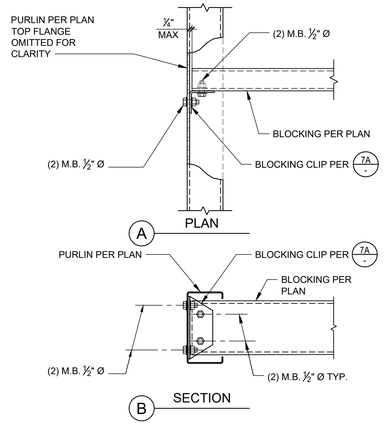
11 - ROOF DECK RIDGE CAP X
1-1/2"=1'-0"



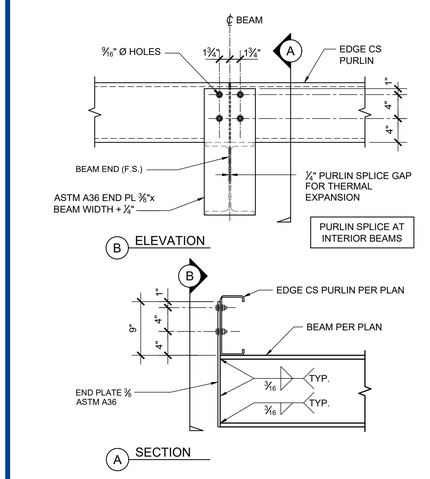
7A - PURLIN BLOCKING CLIP
1"=1'-0"



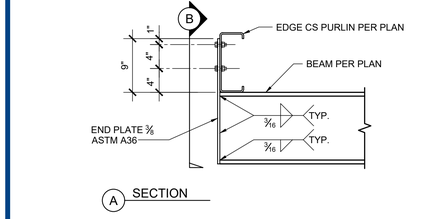
7B - PURLIN BLOCKING CONNECTION AT INTERIOR
1"=1'-0"



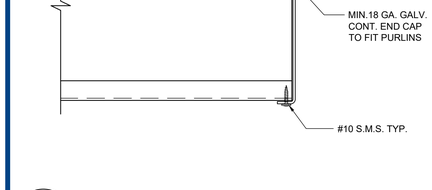
7C - PURLIN BLOCKING CONNECTION AT EXTERIOR
1"=1'-0"



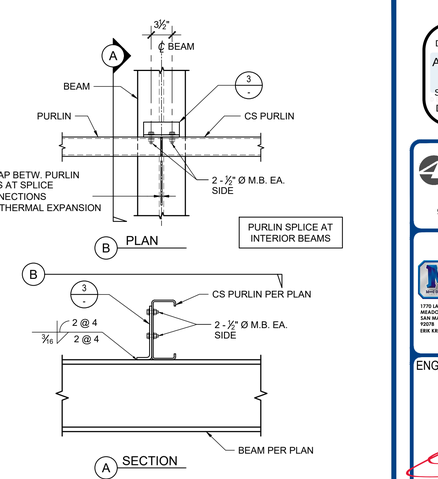
4 - TYPICAL BEAM END PLATE EXTERIOR PURLIN SPLICE
1"=1'-0"



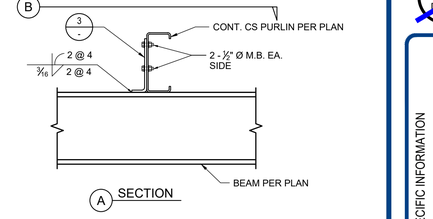
5 - TYPICAL BEAM END PLATE CONT. EXTERIOR PURLIN
1"=1'-0"



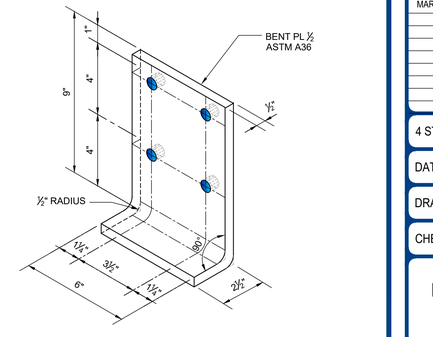
6 - TYP. PURLIN END ENCLOSURE
3'-0"=1'-0"



1 - TYPICAL PURLIN SPLICE AT BEAM
1"=1'-0"



2 - TYP. CONT. PURLIN TO BEAM
1"=1'-0"



3 - TYPICAL PURLIN CLIP ANGLE
3"=1'-0"

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 04-125584 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 09/01/2026

4 STEL ENGINEERING
26030 ACERO,
MISSION VIEJO, CA 92691
949.305.1150 | FAX 949.305.1420

M BAR C CONSTRUCTION INC.
1770 LA COSTA MEADOWS DRIVE
SAN MARCOS, CA 92078
ERIK KRIVOKOPICH
PHONE: (760) 744-4131
FAX: (760) 744-4449
ERIK@MBARCONLINE.COM
LIC # 869960
B AND C57
(770) 787-8845

ENGINEER'S APPROVAL

REGISTERED PROFESSIONAL ENGINEER DUSTIN K. ROSEPINK S 5885 STATE OF CALIFORNIA

BID INFORMATION

THE STRUCTURES AND DESIGNS IN THIS PC ARE PROPRIETARY TO M BAR C CONSTRUCTION, INC. AND 4 S.T.E.L. ENGINEERING, INC. ALL SITES USING THIS PC: M BAR C CONSTRUCTION, INC. SHALL BE THE STEEL CONTRACTOR & 4 S. T. E. L. ENGINEERING, INC. SHALL BE THE SEOR. SEE THE STANDARD NOTES FOR PC USE ON S-1 FOR ADDITIONAL REQUIREMENTS.

PRE-CHECK (PC) DOCUMENT
CODE: 2022 CBC
A SEPARATE PROJECT APPLICATION FOR CONSTRUCTION IS REQUIRED

APPROVED
DIV. OF THE STATE ARCHITECT
APP: 04-122015 PC
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑ CG ☐
DATE: 11/09/2023

SITE SPECIFIC INFORMATION

REVISIONS

MARK	DATE	DESCRIPTION

4 STEL JOB #	MC05-02-1
DATE	11-01-23
DRAWN BY	NML
CHECKED	CDL

PURLIN & ROOF DECK DETAILS

S-10

NOTE: IF DWG. IS NOT 24 x 36, IT IS NOT FULL SIZE

USASHADE & Fabric Structures, Inc.

FABRIC SHADE STRUCTURE

DSA P.C. 04-123501

✓	SHEET NO.	SHEET DESCRIPTION	UNIT STRUCTURE TYPE	MAX. UNIT SIZE	UNIT MODEL NUMBER
X	T-1.0	TITLE SHEET			
X	T-2.0	UNIT SELECTION			
X	T-3.0	T&I FORMS			
	1.1-1000	PRODUCT INFORMATION	HIP	20' x 30' x 15'	DSA4012030-22
	1.2-2000	REACTIONS	HIP	20' x 30' x 15'	DSA4012030-22
	2.1-1000	PRODUCT INFORMATION	HIP	30' x 30' x 15'	DSA4013030-22
	2.2-2000	REACTIONS	HIP	30' x 30' x 15'	DSA4013030-22
	3.1-1000	PRODUCT INFORMATION	HIP	30' x 40' x 15'	DSA4013040-22
	3.2-2000	REACTIONS	HIP	30' x 40' x 15'	DSA4013040-22
	4.1-1000	PRODUCT INFORMATION	HIP	40' x 40' x 15'	DSA4014040-22
	4.2-2000	REACTIONS	HIP	40' x 40' x 15'	DSA4014040-22
	5.1-1000	PRODUCT INFORMATION	HIP	20' x 30' x 12'	DSA401203012-22
	5.2-2000	REACTIONS	HIP	20' x 30' x 12'	DSA401203012-22
	6.1-1000	PRODUCT INFORMATION	HIP	30' x 30' x 12'	DSA401303012-22
	6.2-2000	REACTIONS	HIP	30' x 30' x 12'	DSA401303012-22
	7.1-1000	PRODUCT INFORMATION	HIP	30' x 40' x 12'	DSA401304012-22
	7.2-2000	REACTIONS	HIP	30' x 40' x 12'	DSA401304012-22
	8.1-1000	PRODUCT INFORMATION	HIP (20 psf SNOW LOAD)	20' x 30' x 15'	DSA401S2030-22
	8.2-2000	REACTIONS	HIP (20 psf SNOW LOAD)	20' x 30' x 15'	DSA401S2030-22
	9.1-1000	PRODUCT INFORMATION	JOINED HIPS	VARIES	DSA401J-22
	9.2-1001	DETAILS	JOINED HIPS	VARIES	DSA401J-22
	9.3-2000	REACTIONS	JOINED HIPS	VARIES	DSA401J-22
	10.1-1000	PRODUCT INFORMATION	QUAD JOINED HIPS	VARIES	DSA401Q-22
	10.2-1001	DETAILS	QUAD JOINED HIPS	VARIES	DSA401Q-22
	10.3-2000	REACTIONS	QUAD JOINED HIPS	VARIES	DSA401Q-22
	11.1-1000	PRODUCT INFORMATION	FULL CANTILEVER HIP SINGLE	20' x 30' x 15'	DSA2022030-22
	11.2-2000	REACTIONS	FULL CANTILEVER HIP SINGLE	20' x 30' x 15'	DSA2022030-22
	12.1-1000	PRODUCT INFORMATION	FULL CANTILEVER HIP JOINED	20' x 200' x 15'	DSA3022060-22
	12.2-2000	REACTIONS	FULL CANTILEVER HIP JOINED	20' x 200' x 15'	DSA3022060-22
	13.1-1000	PRODUCT INFORMATION	SINGLE POST PYRAMID	14' x 14' x 12'	DSA1031414-22
	13.2-2000	REACTIONS	SINGLE POST PYRAMID	14' x 14' x 12'	DSA1031414-22
	14.1-1000	PRODUCT INFORMATION	SINGLE POST PYRAMID	20' x 20' x 12'	DSA1032020-22
	14.2-2000	REACTIONS	SINGLE POST PYRAMID	20' x 20' x 12'	DSA1032020-22
	15.1-1000	PRODUCT INFORMATION	SINGLE POST PYRAMID CANTILEVER	14' x 14' x 12'	DSA1241414-22
	15.2-2000	REACTIONS	SINGLE POST PYRAMID CANTILEVER	14' x 14' x 12'	DSA1241414-22
	16.1-1000	PRODUCT INFORMATION	SINGLE POST PYRAMID CANTILEVER	20' x 20' x 12'	DSA1242020-22
	16.2-2000	REACTIONS	SINGLE POST PYRAMID CANTILEVER	20' x 20' x 12'	DSA1242020-22
	17.1-1000	PRODUCT INFORMATION	MARINER PEAK	30' x 30' x 15'	DSA4073030-22
	17.2-2000	REACTIONS	MARINER PEAK	30' x 30' x 15'	DSA4073030-22
	18.1-1000	PRODUCT INFORMATION	MARINER PEAK	30' x 40' x 18'	DSA4073040-22
	18.2-2000	REACTIONS	MARINER PEAK	30' x 40' x 18'	DSA4073040-22
X	19.1-1000	PRODUCT INFORMATION	MARINER PEAK JOINED	30' x 133' x 15'	DSA407J3060-22
X	19.2-2000	REACTIONS	MARINER PEAK JOINED	30' x 133' x 15'	DSA407J3060-22
	20.1-1000	PRODUCT INFORMATION	MARINER PEAK QUAD	60' x 60' x 15'	DSA407Q6060-22
	20.2-2000	REACTIONS	MARINER PEAK QUAD	60' x 60' x 15'	DSA407Q6060-22
	21.1-1000	PRODUCT INFORMATION	TRI TRUSS HIP SINGLE WIDE	20' x 30' x 15'	DSA2062030-22
	21.2-2000	REACTIONS	TRI TRUSS HIP SINGLE WIDE	20' x 30' x 15'	DSA2062030-22
	22.1-1000	PRODUCT INFORMATION	TRI TRUSS HIP JOINED	20' x 200' x 15'	DSA3052060-22
	22.2-2000	REACTIONS	TRI TRUSS HIP JOINED	20' x 200' x 15'	DSA3052060-22
	23.1-1000	PRODUCT INFORMATION	TENSION SAILS THREE POINT	30' x 133' x 15'	DSA30730-22
	23.2-2000	REACTIONS	TENSION SAILS THREE POINT	30' x 133' x 15'	DSA30730-22
	24.1-1000	PRODUCT INFORMATION	TENSIONS SAILS FOUR POINT	20' x 200' x 15'	DSA4182020-22
	24.2-2000	REACTIONS	TENSIONS SAILS FOUR POINT	20' x 200' x 15'	DSA4182020-22
	25.1-1000	PRODUCT INFORMATION	TENSIONS SAILS FOUR POINT	30' x 133' x 15'	DSA4183030-22
	25.2-2000	REACTIONS	TENSIONS SAILS FOUR POINT	30' x 133' x 15'	DSA4183030-22
	26.1-1000	PRODUCT INFORMATION	TRIANGLE	25' x 25' x 15'	DSA30125-22
	26.2-2000	REACTIONS	TRIANGLE	25' x 25' x 15'	DSA30125-22
	27.1-1000	PRODUCT INFORMATION	TRIANGLE	40' x 40' x 15'	DSA30140-22
	27.2-2000	REACTIONS	TRIANGLE	40' x 40' x 15'	DSA30140-22
	28.1-1000	PRODUCT INFORMATION	HEXAGON	Ø40' X 15'	DSA60340-22
	28.2-2000	REACTIONS	HEXAGON	Ø40' X 15'	DSA60340-22
	29.1-1000	PRODUCT INFORMATION	HEXAGON	Ø60' X 15'	DSA60360-22
	29.2-2000	REACTIONS	HEXAGON	Ø60' X 15'	DSA60360-22

TOTAL SHEET COUNT: 63 SHEETS

SHEET INDEX

GENERAL NOTES:

1. ALL WORK SHALL CONFORM TO THE 2022 EDITION OF THE TITLE 24, CALIFORNIA CODE OF REGULATIONS (CCR).
2. ALL WORK SHALL BE IN COMPLIANCE WITH CFC CHAPTER 33 - FIRE SAFETY DURING CONSTRUCTION AND DEMOLITION.
3. SEE INDIVIDUAL STRUCTURAL DRAWINGS FOR SPECIFIC DESIGN NOTES AND LOADING.
4. PRIOR TO SUBMITTAL ARCHITECT OF RECORD SHALL IDENTIFY PC MODEL(S) SELECTED BY END USER ON SHEETS T-1.0 AND T-2.0 BY CHECKING THE APPROPRIATE BOX ASSOCIATED WITH SELECTED PC MODEL(S). EXCLUDE SHEETS FOR MODELS NOT SELECTED.

PLANS FOR SPECIFIC APPLICATION SHALL INCLUDE THE FOLLOWING:

1. COMPLETE SCOPE OF WORK INCLUDING THE SHADE STRUCTURE MODEL NUMBER, P.C. NUMBER, AND SPECIFIC SIZE OF THE SHADE STRUCTURE(S).
2. PROVIDE A CODE ANALYSIS, INCLUDING ACTUAL SHADE STRUCTURE AREA (SQ. FT.), OCCUPANCY TYPE (A-3), AND TYPE OF CONSTRUCTIONS (V-B). INDICATE OCCUPANT LOAD FACTOR (2022 CBC, SECTION 1004).
3. ACTUAL DIMENSIONS OF SHADE STRUCTURES.
4. DIMENSIONS FROM ADJACENT STRUCTURES AND PROXIMITY OF ASSUMED OR ACTUAL PROPERTY LINES.
5. INDICATE LOCATIONS OF FIRE EXTINGUISHERS WITHIN 75 FEET.
6. SHOW LOCATION OF AUDIBLE FIRE ALARM.
7. ALL SADDLES, CLAMPS AND FITTINGS SHALL CONFORM TO THE GUIDELINES AS SPECIFIED IN APPENDICES "A, B, & C", RESPECTIVELY, IN ASCE/SEI 19-16, "STRUCTURAL APPLICATIONS OF STEEL CABLES FOR BUILDINGS."
8. ARCHITECTS OF RECORD TO DETERMINE IF SPECIFIC SITE IS LOCATED IN A MAPPED GEOLOGIC HAZARD ZONE. GEOHAZARD REPORTS REQUIREMENTS SHALL COMPLY WITH DSA IR A-4.
9. ARCHITECTS OF RECORD TO DETERMINE IF SPECIFIC SITE IS LOCATED IN A MAPPED FIRE HAZARD SEVERITY ZONE OR WILDLAND INTERFACE AREA.

FOR SNOW LOAD MODELS ONLY:

10. INDICATE DIMENSIONS FROM THE ROOF TO THE HIGHER STRUCTURE OR TERRAIN FEATURE. MINIMUM DIMENSION OF 20'-0" FOR SNOW LOAD MODEL (ASCE 7-16).
11. ACTUAL SITE ELEVATION (FEET) TO DETERMINE IF THE SITE OCCURS AT OR BELOW THE UPPER ELEVATION LIMIT FOR THE GROUND SNOW LOAD SHOWN IN ASCE 7-16.

P.C. NOTES

PLANS FOR SPECIFIC APPLICATION SHALL INCLUDE THE FOLLOWING:

LIST OF APPLICABLE 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 (CEC), PART 6, TITLE 24 C.C.R.
- 2022 CALIFORNIA FIRE CODE, PART 9, TITLE 24 C.C.R.
- 2022 CALIFORNIA EXISTING BUILDING CODE (CEBC), PART 10, TITLE 24 C.C.R.
- 2022 CALIFORNIA GREEN BUILDING STANDARDS CODE (CALGREEN), 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

APPLICABLE STANDARDS:

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

APPLICABLE CODES

SITE SPECIFIC PARAMETERS

INSTRUCTIONS: DESIGN PROFFESIONAL SHALL CHECK THE APPROPRIATE SELECTION BOXES BELOW AND ENTER THE DESIGN PARAMETERS APPLICABLE TO THE SPECIFIC PROJECT SITE

SEISMIC

SELECT ONE

- [X] DESIGN BASED ON SITE CLASS $D_{default}$
  NO GEOTECHNICAL INVESTIGATION REQUIRED
  Ss = 1.73 Fa = 1.2
- [ ] DESIGN BASED ON SITE CLASS DETERMINED PER CHAPTER 20 OF ASCE 7-16
  GEOTECHNICAL INVESTIGATION PROVIDED
  SITE CLASS: ☐ C ☐ D
  Ss = _____ Fa = _____ PER ASCE 7-16 SUPPL 3, TABLE 11.4-1
- [ ] DESIGN BASED ON SITE CLASS SPECIFIC GROUND MOTION HAZARD ANALYSIS PER CHAPTER 21 OF ASCE 7-16
  SHORT-PERIOD DESIGN SPECTRAL RESPONSE PARAMETER, S_{DS}, SHALL BE AS SPECIFIED IN GEOTECHNICAL INVESTIGATION
  CGS APPROVAL REQUIRED
  NOT ELIGIBLE FOR OTC REVIEW
  SITE CLASS: ☐ C ☐ D

$S_{DS} = 2/3\ Fa\ Ss =$ 1.39 ≤ 2.0

Cs = 1.6 USED IN DESIGN

SEISMIC DESIGN CATEGORY: [X] D ☐ E

CODE ANALYSIS			
OCCUPANCY GROUP	OCCUPANT LOAD FACTOR	TOTAL OCCUPANT LOAD	SHADE STRUCTURE AREA (ft^2)
E	20	90	1,800

SITE SPECIFIC PARAMETERS

MANUFACTURER:

USA SHADE & FABRIC STRUCTURES
2580 ESTERS BOUVLEVARD, SUITE 100
DFW AIRPORT, TEXAS 75261
PH. 800-966-5005
W. www.usa-shade.com

ARCHITECT:

HIGGINSON ARCHITECTS, INC.
DAVID HIGGINSON, AIA, PRINCIPAL ARCHITECT
34247 YUCAIPA BOULEVARD, SUITE D
YUCAIPA, CALIFORNIA 92399
PH. 909-499-0058
E. dhiggInson@higgInsonarchitects.com
W. www.hIggInsonarchitects.com

LICENSED ARCHITECT — DAVID HIGGINSON — C19168 — 10-31-25 RENEWAL DATE — STATE OF CALIFORNIA

8/19/24

STRUCTURAL ENGINEER:

MARK LOWE, S.E.
c/o USA SHADE AND FABRIC STRUCTURES

REGISTERED PROFESSIONAL ENGINEER — MARK ALBERT LOWE — No. 3693 — STRUCTURAL — STATE OF CALIFORNIA

8/23/2024

ARCHITECT / ENGINEER

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 04-125584 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 09/01/2026

THESE PLANS AND SPECIFICATIONS ARE THE PROPERTY OF USA SHADE AND FABRIC STRUCTURES AND SHALL NOT BE REPRODUCED WITHOUT THEIR WRITTEN

USASHADE & Fabric Structures®
CORPORATE HEADQUARTERS
2580 ESTERS BLVD. SUITE 100
DFW AIRPORT, TX, 75261
800-966-5005

CERTIFICATIONS:
IAS CERTIFICATION No: FA-428
CLARK COUNTY MANUFACTURER CERTIFICATION NUMBER (NEVADA): 355

CUSTOMER:
Lake Elsinore U.S.D.

PROJECT NAME:
William Collier Elementary

LOCATION:
20150 Mayhall Drive
Wildomar, CA 92595

MODEL NUMBER:

~~IDENTIFICATION STAMP~~
~~DIV. OF THE STATE ARCHITECT~~
~~APP: 04-123501 PC~~
~~REVIEWED FOR~~
~~SS ☑ FLS ☑ ACS ☐ CG ☐~~
~~DATE: 12/11/2024~~

STRUCTURE TYPE:

SCALE : VARIES

DRAWING SIZE:
D

PRE-CHECK (PC) DOCUMENT
Code : 2022 CBC
A separate project application for construction is required.

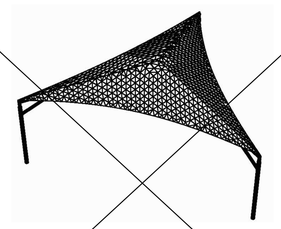
Eng. By :	DWH	8/19/23
Design By :	DWH	8/19/23
Approved By :	DWH	8/19/23

DRAWING DESCRIPTION:

DWG.
TITLE SHEET

SHEET
T-1.0

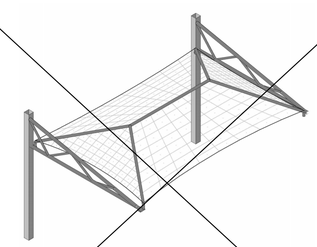
REV.



STRUCTURE MODEL:	DSA30125-22	SEE SHEET 26.1-1000
MAX. SIZE:	25' x 25' x 15'	
MAX. AREA:	271 SQ. FT.	
MAX. OCCUPANCY:	18 PERSONS	
STRUCTURE MODEL:	DSA30140-22	SEE SHEET 27.1-1000
MAX. SIZE:	40' x 40' x 15'	
MAX. AREA:	692 SQ. FT.	
MAX. OCCUPANCY:	46 PERSONS	

FOR DSA 103 TESTING & INSPECTIONS SAMPLE, SEE PC T-3.0

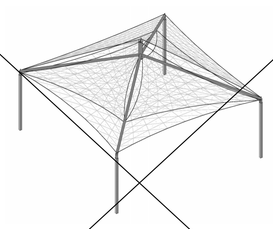
TRIANGLE



STRUCTURE MODEL:	DSA2062030-22	SEE SHEET 21.1-1000
MAX. SIZE:	20' x 30' x 15'	
MAX. AREA:	600 SQ. FT.	
MAX. OCCUPANCY:	40 PERSONS	

FOR DSA 103 TESTING & INSPECTIONS SAMPLE, SEE PC T-3.0

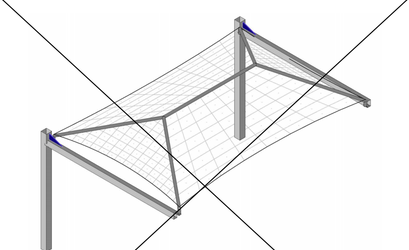
TRI-TRUSS HIP SINGLE WIDE



STRUCTURE MODEL:	DSA4073030-22	SEE SHEET 17.1-1000
MAX. SIZE:	30' x 30' x 15'	
MAX. AREA:	900 SQ. FT.	
MAX. OCCUPANCY:	60 PERSONS	
STRUCTURE MODEL:	DSA4073040-22	SEE SHEET 18.1-1000
MAX. SIZE:	30' x 40' x 15'	
MAX. AREA:	1,200 SQ. FT.	
MAX. OCCUPANCY:	80 PERSONS	

FOR DSA 103 TESTING & INSPECTIONS SAMPLE, SEE PC T-3.0

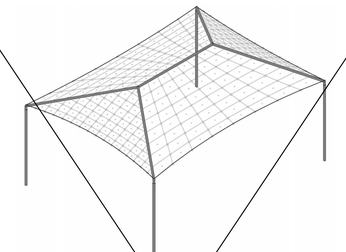
MARINER PEAK



STRUCTURE MODEL:	DSA2022030-22	SEE SHEET 11.1-1000
MAX. SIZE:	20' x 30' x 15'	
MAX. AREA:	600 SQ. FT.	
MAX. OCCUPANCY:	40 PERSONS	

FOR DSA 103 TESTING & INSPECTIONS SAMPLE, SEE PC T-3.0

FULL CANTILEVER HIP SINGLE



STRUCTURE MODEL:	DSA4012030-22	SEE SHEET 1.1-1000
MAX. SIZE:	20' x 30' x 15'	
MAX. AREA:	600 SQ. FT.	
MAX. OCCUPANCY:	40 PERSONS	
STRUCTURE MODEL:	DSA4013030-22	SEE SHEET 2.1-1000
MAX. SIZE:	30' x 30' x 15'	
MAX. AREA:	900 SQ. FT.	
MAX. OCCUPANCY:	60 PERSONS	
STRUCTURE MODEL:	DSA4013040-22	SEE SHEET 3.1-1000
MAX. SIZE:	30' x 40' x 15'	
MAX. AREA:	1,200 SQ. FT.	
MAX. OCCUPANCY:	80 PERSONS	
STRUCTURE MODEL:	DSA4014040-22	SEE SHEET 4.1-1000
MAX. SIZE:	40' x 40' x 15'	
MAX. AREA:	1,600 SQ. FT.	
MAX. OCCUPANCY:	106 PERSONS	
STRUCTURE MODEL:	DSA401203012-22	SEE SHEET 5.1-1000
MAX. SIZE:	20' x 30' x 12'	
MAX. AREA:	600 SQ. FT.	
MAX. OCCUPANCY:	40 PERSONS	
STRUCTURE MODEL:	DSA401303012-22	SEE SHEET 6.1-1000
MAX. SIZE:	30' x 30' x 12'	
MAX. AREA:	900 SQ. FT.	
MAX. OCCUPANCY:	60 PERSONS	
STRUCTURE MODEL:	DSA401304012-22	SEE SHEET 7.1-1000
MAX. SIZE:	30' x 40' x 12'	
MAX. AREA:	1,200 SQ. FT.	
MAX. OCCUPANCY:	80 PERSONS	
STRUCTURE MODEL:	DSA401S2030-22 (20 psf SNOW LOAD)	SEE SHEET 8.1-1000
MAX. SIZE:	20' x 30' x 15'	
MAX. AREA:	600 SQ. FT.	
MAX. OCCUPANCY:	40 PERSONS	

FOR DSA 103 TESTING & INSPECTIONS SAMPLE, SEE PC T-3.0

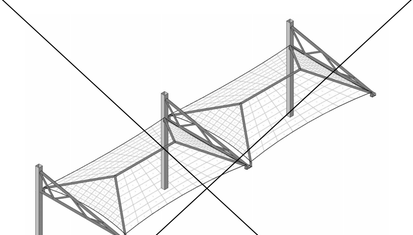
HIP



STRUCTURE MODEL:	DSA60340-22	SEE SHEET 28.1-1000
MAX. SIZE:	040' x 15'	
MAX. AREA:	1,040 SQ. FT.	
MAX. OCCUPANCY:	69 PERSONS	
STRUCTURE MODEL:	DSA60360-22	SEE SHEET 29.1-1000
MAX. SIZE:	060' x 15'	
MAX. AREA:	2,338 SQ. FT.	
MAX. OCCUPANCY:	156 PERSONS	

FOR DSA 103 TESTING & INSPECTIONS SAMPLE, SEE PC T-3.0

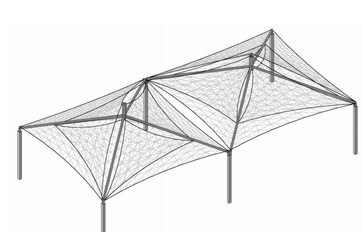
HEXAGON



STRUCTURE MODEL:	DSA3052060-22	SEE SHEET 22.1-1000
MAX. SIZE:	20' x 200' x 15'	
MAX. AREA:	4,000 SQ. FT.	
MAX. OCCUPANCY:	266 PERSONS	

FOR DSA 103 TESTING & INSPECTIONS SAMPLE, SEE PC T-3.0

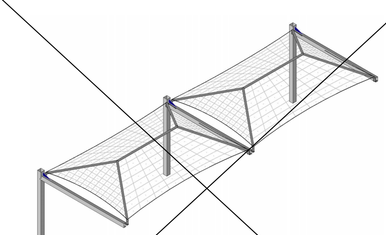
TRI-TRUSS HIP JOINED



X STRUCTURE MODEL:	DSA407J3060-22	SEE SHEET 19.1-1000
MAX. SIZE:	30' x 133' x 15'	
MAX. AREA:	3,990 SQ. FT.	
MAX. OCCUPANCY:	266 PERSONS	

FOR DSA 103 TESTING & INSPECTIONS SAMPLE, SEE PC T-3.0

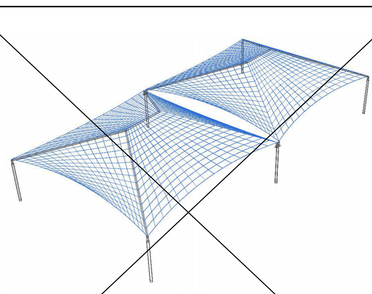
MARINER PEAK JOINED



STRUCTURE MODEL:	DSA3022060-22	SEE SHEET 12.1-1000
MAX. SIZE:	20' x 200' x 15'	
MAX. AREA:	4,000 SQ. FT.	
MAX. OCCUPANCY:	266 PERSONS	

FOR DSA 103 TESTING & INSPECTIONS SAMPLE, SEE PC T-3.0

FULL CANTILEVER HIP JOINED

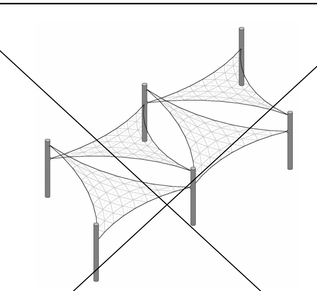


STRUCTURE MODEL:	DSA401J-22	SEE SHEET 9.1-1000
MAX. SIZE:	VARIES, SEE JOINED HIP UNIT SHEET	
MAX. AREA:	VARIES	
MAX. OCCUPANCY:	VARIES	

FOR DSA 103 TESTING & INSPECTIONS SAMPLE, SEE PC T-3.0

JOINED HIP

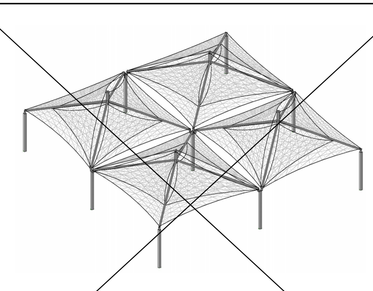
NOT USED



STRUCTURE MODEL:	DSA30730-22	SEE SHEET 23.1-1000
MAX. SIZE:	30' x 133' x 15'	
MAX. AREA:	3,990 SQ. FT.	
MAX. OCCUPANCY:	266 PERSONS	

FOR DSA 103 TESTING & INSPECTIONS SAMPLE, SEE PC T-3.0

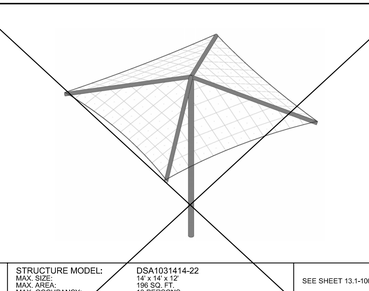
TENSIONS SAILS THREE-POINT



STRUCTURE MODEL:	DSA407Q6060-22	SEE SHEET 20.1-1000
MAX. SIZE:	60' x 60' x 15'	
MAX. AREA:	3,600 SQ. FT.	
MAX. OCCUPANCY:	240 PERSONS	

FOR DSA 103 TESTING & INSPECTIONS SAMPLE, SEE PC T-3.0

MARINER PEAK QUAD



STRUCTURE MODEL:	DSA1031414-22	SEE SHEET 13.1-1000
MAX. SIZE:	14' x 14' x 12'	
MAX. AREA:	196 SQ. FT.	
MAX. OCCUPANCY:	13 PERSONS	
STRUCTURE MODEL:	DSA1032020-22	SEE SHEET 14.1-1000
MAX. SIZE:	20' x 20' x 12'	
MAX. AREA:	400 SQ. FT.	
MAX. OCCUPANCY:	26 PERSONS	

FOR DSA 103 TESTING & INSPECTIONS SAMPLE, SEE PC T-3.0

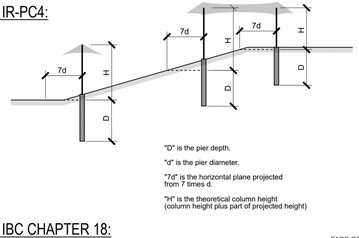
SINGLE POST PYRAMID

STRUCTURE MODEL:	DSA401Q-22	SEE SHEET 10.1-1000
MAX. SIZE:	VARIES, SEE QUAD HIP UNIT SHEET	
MAX. AREA:	VARIES	
MAX. OCCUPANCY:	VARIES	

FOR DSA 103 TESTING & INSPECTIONS SAMPLE, SEE PC T-3.0

QUAD HIP

PER IR-PC4:



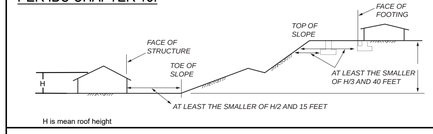
"D" is the pier depth.

"d" is the pier diameter.

"7d" is the horizontal plane projected from 7 times d.

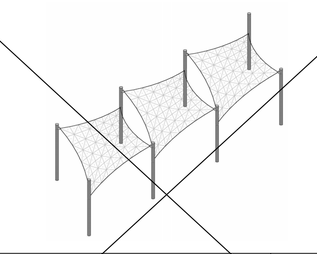
"H" is the theoretical column height (column height plus part of projected height)

PER IBC CHAPTER 18:



H is mean roof height

PC SLOPE DESIGN PARAMETERS

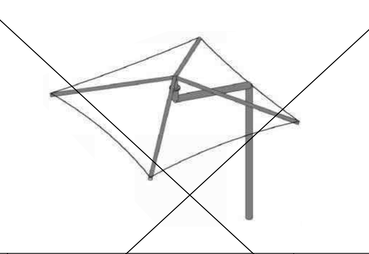


STRUCTURE MODEL:	DSA4182020-22	SEE SHEET 24.1-1000
MAX. SIZE:	20' x 200' x 15'	
MAX. AREA:	4,000 SQ. FT.	
MAX. OCCUPANCY:	266 PERSONS	
STRUCTURE MODEL:	DSA4183030-22	SEE SHEET 25.1-1000
MAX. SIZE:	30' x 133' x 15'	
MAX. AREA:	3,990 SQ. FT.	
MAX. OCCUPANCY:	266 PERSONS	

FOR DSA 103 TESTING & INSPECTIONS SAMPLE, SEE PC T-3.0

TENSIONS SAILS FOUR-POINT

NOT USED



STRUCTURE MODEL:	DSA1241414-22	SEE SHEET 15.1-1000
MAX. SIZE:	14' x 14' x 12'	
MAX. AREA:	196 SQ. FT.	
MAX. OCCUPANCY:	13 PERSONS	
STRUCTURE MODEL:	DSA1242020-22	SEE SHEET 16.1-1000
MAX. SIZE:	20' x 20' x 12'	
MAX. AREA:	400 SQ. FT.	
MAX. OCCUPANCY:	26 PERSONS	

FOR DSA 103 TESTING & INSPECTIONS SAMPLE, SEE PC T-3.0

SINGLE POST PYRAMID CANTILEVER

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 04-125584 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 09/01/2026

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 04-123501 PC
REVIEWED FOR
SS ☑ FLS ☑ ACS ☐ CG ☐
DATE: 12/11/2024

THESE PLANS AND SPECIFICATIONS ARE THE PROPERTY OF USA SHADE AND FABRIC STRUCTURES AND SHALL NOT BE REPRODUCED WITHOUT THEIR WRITTEN

USA SHADE & Fabric Structures®

CORPORATE HEADQUARTERS
2580 ESTERS BLVD. SUITE 100
DFW AIRPORT, TX, 75261
800-966-5005

CERTIFICATIONS:

IAS CERTIFICATION No: FA-428

CLARK COUNTY MANUFACTURER CERTIFICATION NUMBER (NEVADA): 355

CUSTOMER:
Lake Elsinore U.S.D.

PROJECT NAME:
William Collier Elementary

LOCATION:
20150 Mayhall Drive
Wildomar, CA 92595

MODEL NUMBER:

STRUCTURE TYPE:

SCALE : VARIES

DRAWING SIZE:
D

PRE-CHECK (PC) DOCUMENT
Code : 2022 CBC
A separate project application for construction is required.

Eng. By :	DWH	8/19/23
Design By :	DWH	8/19/23
Approved By :	DWH	8/19/23

DRAWING DESCRIPTION:

DWG.
UNIT SELECTION

SHEET
T-2.0

REV.

LICENSED ARCHITECT DAVID HIGGINSON C19168 10-31-25 RENEWAL DATE STATE OF CALIFORNIA
8/19/24

REGISTERED PROFESSIONAL ENGINEER MARK ALBERT LOWE No. 3693 STRUCTURAL STATE OF CALIFORNIA
8/23/2024

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS, 2022 CBC
General

Application Number:	School Name:	School District:
04-123501	PCC FABRIC SHADE STRUCTURES	USA SHADE AND FABRIC STRUCTURES
DSA File Number:	Increment Number:	Date Created:
PC-140		2024-08-06 15:16:59

IMPORTANT: This form is only a summary list of structural tests and some of the special inspections required for the project. Generally, the structural tests and special inspections noted on this form are those that will be performed by the Geotechnical Engineer of Record, Laboratory of Record, or Special Inspector. The actual complete test and inspection program must be performed as detailed on the DSA approved documents. The appendix at the bottom of this form identifies work NOT subject to DSA requirements for special inspection or structural testing. The project inspector is responsible for providing inspection of all facets of construction, including but not limited to, special inspections not listed on this form such as structural wood framing, high-load wood diaphragms, cold-formed steel framing, anchorage of non-structural components, etc., per Title 24, Part 2, Chapter 17A (2022 CBC).

****NOTE:** Undefined section and table references found in this document are from the CBC, or California Building Code.

KEY TO COLUMNS

1. TYPE	2. PERFORMED BY
Continuous – Indicates that a continuous special inspection is required **Periodic –** Indicates that a periodic special inspection is required **Test –** Indicates that a test is required	**GE (Geotechnical Engineer) –** Indicates that the special inspection shall be performed by a registered geotechnical engineer or his or her authorized representative. **LOR (Laboratory of Record) –** Indicates that the test or special inspection shall be performed by a testing laboratory accepted in the DSA Laboratory Evaluation and Acceptance (LEA) Program. See CAC Section 4-335. **PI (Project Inspector) –** Indicates that the special inspection may be performed by a project inspector when specifically approved by DSA. **SI (Special Inspection) –** Indicates that the special inspection shall be performed by an appropriately qualified/approved special inspector.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC
Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number:	School Name:	School District:
04-123501	PCC FABRIC SHADE STRUCTURES	USA SHADE AND FABRIC STRUCTURES
DSA File Number:	Increment Number:	Date Created:
PC-140		2024-08-06 15:16:59

Geotechnical Reports: Project does NOT have and does NOT require a geotechnical report

	S1. GENERAL:			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☑	**a.** 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 must not contain loose material, mud, organic silt, organic clays, or peat.	See Notes	PI	Refer to specific items identified in the Appendix listing exemptions for limitations. Placement of controlled fill exceeding 12" depth under foundations and/or within the building envelope is not permitted without a geotechnical report.

	S2. SOIL COMPACTION AND FILL:	see T&I Note #7 for additional information		
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Perform classification and testing of fill materials.	Test	LOR*	* Under the supervision of the geotechnical engineer.
☐	**b.** Verify use of proper materials, densities and inspect lift thicknesses, placement and compaction during placement of fill.	Continuous	LOR*	* Under the supervision of a geotechnical engineer or LOR's engineering manager. Refer to specific items identified in the Appendix listing exemptions for limitations.
☐	**c.** Compaction testing.	Test	LOR*	* Under the supervision of a geotechnical engineer or LOR's engineering manager. Refer to specific items identified in the Appendix listing exemptions for limitations.

	S3. DRIVEN DEEP FOUNDATIONS (PILES):			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Verify pile materials, sizes and lengths comply with the requirements.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC
Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number:	School Name:	School District:
04-123501	PCC FABRIC SHADE STRUCTURES	USA SHADE AND FABRIC STRUCTURES
DSA File Number:	Increment Number:	Date Created:
PC-140		2024-08-06 15:16:59

	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**b.** Determine capacities of test piles and conduct additional load tests as required.	Test	LOR*	* Under the supervision of the geotechnical engineer.
☐	**c.** Inspect driving operations and maintain complete and accurate records for each pile.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
☐	**d.** 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.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
☐	**e.** Steel piles.	Provide tests and inspections per STEEL section below.		
☐	**f.** Concrete piles and concrete filled piles.	Provide tests and inspections per CONCRETE section below.		
☐	**g.** 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):	see T&I Note #8 for additional information		
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Note**
☑	**a.** Inspect drilling operations and maintain complete and accurate records for each pier.	Continuous	PI	Continuous inspection to be provided by project inspector. Refer to specific items identified in the Appendix listing exemptions for limitations.
☑	**b.** Verify pier locations, diameters, plumbness and lengths.Record concrete or grout volumes.	Continuous	PI	Continuous inspection to be provided by project inspector. Refer to specific items identified in the Appendix listing exemptions for limitations.
☑	**c.** Concrete piers.	Provide tests and inspections per CONCRETE section below.		

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC
Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number:	School Name:	School District:
04-123501	PCC FABRIC SHADE STRUCTURES	USA SHADE AND FABRIC STRUCTURES
DSA File Number:	Increment Number:	Date Created:
PC-140		2024-08-06 15:16:59

	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
	S5. RETAINING WALLS:			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Placement, compaction and inspection of backfill.	Continuous	GE*	**1705A.6.1.** * By geotechnical engineer or his or her qualified representative. (See section S2 above).
☐	**b.** Placement of soil reinforcement and/or drainage devices.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
☐	**c.** Segmental retaining walls; inspect placement of units, dowels, connectors, etc.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative. See DSA IR 18-2.
☐	**d.** Concrete retaining walls.	Provide tests and inspections per CONCRETE section below.		
☐	**e.** Masonry retaining walls.	Provide tests and inspections per MASONRY section below.		

	S6. OTHER SOILS:			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Soil Improvements	Test	GE*	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.
☐	**b.** Inspection of Soil Improvements	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
☐	**c.**			

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (CONCRETE), 2022 CBC
Table 1705A.3; ACI 318-19 Sections 26.12 & 26.13

Application Number:	School Name:	School District:
04-123501	PCC FABRIC SHADE STRUCTURES	USA SHADE AND FABRIC STRUCTURES
DSA File Number:	Increment Number:	Date Created:
PC-140		2024-08-06 15:16:59

	C1. CAST-IN-PLACE CONCRETE			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☑	**a.** Verify use of required design mix.	Continuous	SI	**Table 1705A.3 Item 5, 1910A.1.**
☑	**b.** Identifiy, sample, and test reinforcing steel.	Test	LOR	**1910A.2;** ACI 318-19 Ch.20 and Section 26.6.1.2; DSA IR 17-10. (See Appendix (end of this form) for exemptions.)
☑	**c.** During concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	Test	LOR	**Table 1705A.3 Item 6**; ACI 318-19 Sections 26.5 & 26.12.
☑	**d.** Test concrete (f'_c).	Test	LOR	**1905A.1.17;** ACI 318-19 Section 26.12.
☑	**e.** Batch plant inspection: **Not Required**	See Notes	SI	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.)
☐	**f.** Welding of reinforcing steel.	Provide special inspection per STEEL, Category S/A4(d) & (e) and/or S/A5(g) & (h) below.		

	C2. PRESTRESSED / POST-TENSIONED CONCRETE (IN ADDITION TO SECTION C1):			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Sample and test prestressing tendons and anchorages.	Test	LOR	**1705A.3.4, 1910A.3**
☐	**b.** Inspect placement of prestressing tendons.	Periodic	SI	**1705A.3.4, Table 1705A.3 Items 1 & 9.**

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (CONCRETE), 2022 CBC
Table 1705A.3; ACI 318-19 Sections 26.12 & 26.13

Application Number:	School Name:	School District:
04-123501	PCC FABRIC SHADE STRUCTURES	USA SHADE AND FABRIC STRUCTURES
DSA File Number:	Increment Number:	Date Created:
PC-140		2024-08-06 15:16:59

	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**c.** Verify in-situ concrete strength prior to stressing of post-tensioning tendons.	Periodic	SI	**Table 1705A.3 Item 13.** Special inspector to verify specified concrete strength test prior to stressing.
☐	**d.** Inspect application of post-tensioning or prestressing forces and grouting of bonded prestressing tendons.	Continuous	SI	**1705A.3.4, Table 1705A.3 Item 9;** ACI 318-19 Section 26.13

	C3. PRECAST CONCRETE (IN ADDITION TO SECTION C1):			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Inspect fabrication of precast concrete members.	Continuous	SI	ACI 318-19 Section 26.13, and PCI MNL-128 and -130.
☐	**b.** Inspect erection of precast concrete members.	Periodic	SI*	**Table 1705A.3 Item 10.** * May be performed by PI when specifically approved by DSA.
☐	**c.** 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.	Continuous	SI	Table 1705A.3; ACI 318-19 Section 26.13.1.3; ACI 550.5
☐	**d.** Inspect installation tolerances of precast concrete diaphragm connections for compliance with ACI 550.5.	Periodic	SI	Table 1705A.3; ACI 318-19 Section 26.13.1.3; ACI 550.5

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (CONCRETE), 2022 CBC
Table 1705A.3; ACI 318-19 Sections 26.12 & 26.13

Application Number:	School Name:	School District:
04-123501	PCC FABRIC SHADE STRUCTURES	USA SHADE AND FABRIC STRUCTURES
DSA File Number:	Increment Number:	Date Created:
PC-140		2024-08-06 15:16:59

	C4. SHOTCRETE (IN ADDITION TO SECTION C1):			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Inspect shotcrete placement for proper application techniques.	Continuous	SI	**1705A.3.9, Table 1705A.3 Item 7, 1908A.1, 1908A.2, 1908A.3.** See ACI 506.2-13 Section 3.4, ACI 506R-16.
☐	**b.** Sample and test shotcrete (f'_c).	Test	LOR	**1908A.2, 1705A.3.9**

	C5. POST-INSTALLED ANCHORS:			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Inspect installation of post-installed anchors	See Notes	SI*	**1617A.1.19, Table 1705A.3 Item 4a (Continuous) & 4b (Periodic), 1705A.3.8** (See Appendix (end of this form) for exemptions). ACI 318-19 Section 26.13. * May be performed by the project inspector when specifically approved by DSA.
☐	**b.** Test post-installed anchors.	Test	LOR	**1910A.5.** (See Appendix (end of this form) for exemptions.)

	C6. OTHER CONCRETE:			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.**			

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMINNUM), 2022 CBC
1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number:	School Name:	School District:
04-123501	PCC FABRIC SHADE STRUCTURES	USA SHADE AND FABRIC STRUCTURES
DSA File Number:	Increment Number:	Date Created:
PC-140		2024-08-06 15:16:59

	S/A1. STRUCTURAL STEEL, COLD-FORMED STEEL AND ALUMINUM USED FOR STRUCTURAL PURPOSES			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☑	**a.** Verify identification of all materials and: • Mill certificates indicate material properties that comply with requirements. •Material sizes, types and grades comply with requirements.	Periodic	*	**Table 1705A.2.1 Item 3a–3c.** 2202A.1; AISI S100-20 Section A3.1 & A3.2, AISI S240-20 Section A3 & A5, AISI S220-20 Sections A4 & A6. * By special inspector or qualified technician when performed off-site.
☑	**b.** Test unidentified materials	Test	LOR	**2202A.1.**
☑	**c.** Examine seam welds of HSS shapes	Periodic	SI	DSA IR 17-3.
☑	**d.** Verify and document steel fabrication per DSA-approved construction documents.	Periodic	SI	Not applicable to cold-formed steel light-frame construction, except for trusses (**1705A.2.4**).
☐	**e.** Buckling restrained braces.	Test	LOR	Testing and special inspections in accordance with IR 22-4.

	S/A2. HIGH-STRENGTH BOLTS:	see Testing Matrix table for additional information		
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☑	**a.** Verify identification markings and manufacturer's certificates of compliance conform to ASTM standards specified in the DSA-approved documents.	Periodic	SI	**Table 1705A.2.1 Items 1a & 1b, 2202A.1;** AISC 360-16 Section A3.3, J3.1, and N3.2; RCSC 2014 Section 1.5 & 2.1; DSA IR 17-8 & DSA IR 17-9.
☑	**b.** Test high-strength bolts, nuts and washers.	Test	LOR	**Table 1705A.2.1 Item 1c, 2213A.1**; RCSC 2014 Section 7.2; DSA IR 17-8.
☑	**c.** Bearing-type ("snug tight") connections.	Periodic	SI	**Table 1705A.2.1 Item 2a, 1705A.2.6, 2204A.2**; AISC 360-16 J3.1, J3.2, M2.5 & N5.6; RCSC 2014 Section 9.1; DSA IR 17-9.
☑	**d.** Pretensioned and slip-critical connections.	*	SI	**Table 1705A.2.1 Items 2b & 2c, 1705A.2.6, 2204A.2**; AISC 360-16 J3.1, J3.2, M2.5 & N5.6; RCSC 2014 Sections 9.2 & 9.3; DSA IR 17-9. *"Continuous" or "Periodic" depends on the tightening method used.

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1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

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	S/A3. WELDING:			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☑	**a.** Verify weld filler material identification markings per AWS designation listed on the DSA-approved documents and the WPS.	Periodic	SI	**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.
☑	b. Verify weld filler material manufacturer's certificate of compliance.	Periodic	SI	DSA IR 17-3.
☑	**c.** Verify WPS, welder qualifications and equipment.	Periodic	SI	DSA IR 17-3.

	S/A4. SHOP WELDING (IN ADDITION TO SECTION S/A3):			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☑	**a.** Inspect groove welds, multi-pass fillet welds, single pass fillet welds > 5/16", plug and slot welds.	Continuous	SI	**Table 1705A.2.1 Items 5a.1–4;** AISC 360-16 (and AISC 341-16 as applicable); DSA IR 17-3.
☑	b. Inspect single-pass fillet welds ≤ 5/16", floor and roof deck welds.	Periodic	SI	**1705A.2.2, Table 1705A.2.1 Items 5a.5 & 5a.6;** AISC 360-16 (and AISC 341-16 as applicable); DSA IR 17-3.
☐	**c.** Inspect welding of stairs and railing systems.	Periodic	SI	**1705A.2.1**; AISC 360-16 (and AISC 341-16 as applicable); AWS D1.1 & D1.3; DSA IR 17-3.
☐	**d.** Verification of reinforcing steel weldability other than ASTM A706.	Periodic	SI	**1705A.3.1**; AWS D1.4; DSA IR 17-3. Verify carbon equivalent reported on mill certificates.
☐	**e.** Inspect welding of reinforcing steel.	Continuous	SI	**Table 1705A.2.1 Item 5b, 1705A.3.1, Table 1705A.3 Item 2, 1903A.8;** AWS D1.4; DSA IR 17-3.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC
1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

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	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
	S/A5. FIELD WELDING (IN ADDITION TO SECTION S/A3):			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Inspect groove welds, multi-pass fillet welds, single pass fillet welds > 5/16", plug and slot welds.	Continuous	SI	**Table 1705A.2.1 Items 5a.1–4;** AISC 360-16 (AISC 341-16 as applicable); DSA IR 17-3.
☐	b. Inspect single-pass fillet welds ≤ 5/16".	Periodic	SI	**Table 1705A.2.1 Item 5a.5**; AISC 360-16 (AISC 341-16 as applicable); DSA IR 17-3.
☐	**c.** Inspect end-welded studs (ASTM A-108) installation (including bend test).	Periodic	SI	**2213A.2**; AISC 360-16 (AISC 341-16 as applicable); AWS D1.1; DSA IR 17-3.
☐	**d.** Inspect floor and roof deck welds.	Periodic	SI	**1705A.2.2, Table 1705A.2.1 Item 5a.6;** AISC 360-16 (AISC 341-16 as applicable); AWS D1.3; DSA IR 17-3.
☐	**e.** Inspect welding of structural cold-formed steel.	Periodic	SI*	**1705A.2.5; AWS D1.3; DSA IR 17-3.** The quality control provisions of AISI S240-20 Chapter D shall also apply. * May be performed by the project inspector when specifically approved by DSA.
☐	**f.** Inspect welding of stairs and railing systems.	Periodic	SI*	**1705A.2.1**; AISC 360-16 (AISC 341-16 as applicable); AWS D1.1 & D1.3; DSA IR 17-3. * May be performed by the project inspector when specifically approved by DSA.
☐	**g.** Verification of reinforcing steel weldability.	Periodic	SI	**1705A.3.1**; AWS D1.4; DSA IR 17-3. Verify carbon equivalent reported on mill certificates.
☐	**h.** Inspect welding of reinforcing steel.	Continuous	SI	**Table 1705A.2.1 Item 5b, 1705A.3.1, Table 1705A.3 Item 2, 1903A.8;** AWS D1.4; DSA IR 17-3.

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1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

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	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
	S/A6. NONDESTRUCTIVE TESTING:			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Ultrasonic	Test	LOR	**1705A.2.1, 1705A.2.5;** AISC 341-16 J6.2, AISC 360-16 N5.5; AWS D1.1, AWS D1.8; DSA IR 17-2.
☐	**b.** Magnetic Particle	Test	LOR	**1705A.2.1, 1705A.2.5;** AISC 341-16 J6.2, AISC 360-16 N5.5; AWS D1.1, AWS D1.8; DSA IR 17-2.
☐	**c.**	Test	LOR	

	S/A7. STEEL JOISTS AND TRUSSES:			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** 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.	Continuous	SI	**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.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC
1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

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	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
	S/A8. SPRAYED FIRE-RESISTANT MATERIALS:			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Examine structural steel surface conditions, inspect application, take samples, measure thickness and verify compliance of all aspects of application with DSA-approved documents.	Periodic	SI	**1705A.15, 1705A.15.1, 1705A.15.2, 1705A.15.3, 1705A.15.4, 1705A.15.5, 1705A.15.6.**
☐	**b.** Test density.	Test	LOR	**1705A.15.1, 1705A.15.5, ASTM E605**
☐	**c.** Bond strength adhesion/cohesion.	Test	LOR	**1705A.15.1, 1705A.15.6, ASTM E736**

	S/A9. ANCHOR BOLTS AND ANCHOR RODS:	see T&I Note #9 for additional information		
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☑	**a.** Anchor Bolts and Anchor Rods	Test	LOR	Identify, sample and test anchor bolts and anchor rods **not** meeting exemptions identified in Section 1 of IR 17-11.
☑	**b.** Threaded rod not used for foundation anchorage.	Test	LOR	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	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Materials used, to verify compliance with one or more of the material test reports in accordance with the approved construction documents.	Periodic	SI	Table 1705A.13.7
☐	**b.** Fabricated storage rack elements.	Periodic	SI	1704A.2.5; Table 1705A.13.7

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1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

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	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**c.** Storage rack anchorage installation.	Periodic	SI	ANSI/MH16.1 Section 7.3.2; Table 1705A.13.7
☐	**d.** Completed storage rack system to indicate compliance with the approved construction documents.	Periodic	SI*	Table 1705A.13.7; * May be preformed by the project inspector when specifically approved by DSA.

	S/A11. Other Steel			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.**			

GENERAL DSA-103 NOTES:

1. THE SAMPLE DSA-103 FORM PROVIDED ON THIS SHEET IS FOR ILLUSTRATIVE PURPOSES ONLY TO ASSIST IN THE COMPLETION OF SPECIFIC DSA-103 FORMS FOR FUTURE PROJECTS.
2. A CURRENT DSA-103 FORM IS TO BE COMPLETED FOR EACH APPLICATION THAT THIS P.C. DOCUMENT IS BEING INCORPORATED INTO AND ALL SAMPLE DSA-103 SHEETS ARE TO BE CROSSED OUT ON THIS SHEET

TESTING AND INSPECTION NOTES:

1. THE PROJECT INSPECTOR AND TESTING AGENCY SHALL BE SELECTED BY THE SCHOOL DISTRICT AND APPROVED BY DSA AND THE ARCHITECT OF RECORD.
2. THE SITE PROJECT INSPECTOR SHALL BE CLASS 2. IF THE TOTAL AREA OF THE SHADE STRUCTURE(S) IS LESS THAN 2,000 SQ. FT. WITH NO FIELD WELDING OR HIGH-STRENGTH FASTENERS THEN THE SITE PROJECT INSPECTOR MAY BE A CLASS 3.
3. THE COSTS OF THE PROJECT INSPECTOR AND TESTING AGENCY SHALL BE BORN BY THE SCHOOL DISTRICT.
4. COPIES OF THE VERIFIED REPORTS SHALL BE SENT TO DSA, THE ARCHITECT, THE SCHOOL DISTRICT, THE CONTRACTOR, AND THE PROJECT INSPECTOR.
5. THE IN-PLANT INSPECTOR SHALL BE A WELDING SPECIAL INSPECTOR FOR MATERIAL VERIFICATION AND WELDING.
6. PER 2022 CBC, SECTION 1705A.3.3, BATCH PLANT INSPECTION MAY BE WAIVED WHEN THE FOLLOWING REQUIREMENTS ARE MET:
   6.1. A LICENSED WEIGHMASTER SHALL POSITIVELY IDENTIFY QUANTITY OF MATERIALS AND CERTIFY EACH LOAD BY A BATCH TICKET.
   6.2. BATCH TICKETS, INCLUDING MATERIAL QUANTITIES AND WEIGHTS SHALL ACCOMPANY THE LOAD, SHALL BE TRANSMITTED TO THE INSPECTOR OF RECORD BY THE TRUCK DRIVER WITH LOAD IDENTIFIED THEREON. THE LOAD SHALL NOT BE PLACED WITHOUT A BATCH TICKET IDENTIFYING THE MIX. THE INSPECTOR OF RECORD SHALL KEEP A DAILY RECORD OF PLACEMENTS, IDENTIFYING EACH TRUCK, IT'S LOAD, TIME OF RECEIPT AT THE JOBSITE, AND APPROXIMATE LOCATION OF DEPOSIT IN THE STRUCTURE AND SHALL MAINTAIN A COPY OF THE DAILY RECORD AS REQUIRED BY THE ENFORCING AGENCY.
7. INCLUDE SECTION S2 - SOIL COMPACTION AND FILL WHEN OVER-EX AND RE-COMPACTING OCCURS.
8. S4 - CAST-IN-PLACE DEEP FOUNDATIONS (PIERS): NOT REQUIRED IF SPREAD FOOTING OPTION IS CHOSEN.
9. S/A9 - ANCHOR BOLT AND ANCHOR ROD: NOT REQUIRED IF EMBEDDED BASE PLATE OPTION IS CHOSEN.

HIGH-STRENGTH BOLTS (S/A2) SPECIAL INSPECTIONS TESTING MATRIX FOR SPECIFIC MODELS

✓	MODEL	SHEET	HIGH STRENGTH BOLTS	PRETENSIONED / SLIP-CRITICAL CONNECTIONS
	DSA2022030-22	11.1-1000	YES	-
	DSA3022060-22	12.1-1000	YES	-
	DSA1031414-22	13.1-1000	YES	YES
	DSA1032020-22	14.1-1000	YES	YES
	DSA1241414-22	15.1-1000	YES	YES
	DSA1242020-22	16.1-1000	YES	YES
	DSA2062030-22	21.1-1000	YES	-
	DSA3052060-22	22.1-1000	YES	-

LICENSED ARCHITECT — DAVID HIGGINSON — C19168 — 10-31-25 RENEWAL DATE — STATE OF CALIFORNIA
8/19/24

REGISTERED PROFESSIONAL ENGINEER — MARK ALBERT LOWE — No. 3693 — STRUCTURAL — STATE OF CALIFORNIA
8/23/2024

DSA 103 (SAMPLE) - STATEMENT OF STRUCTURAL TESTS AND INSPECTIONS

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 04-125584 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 09/01/2026

THESE PLANS AND SPECIFICATIONS ARE THE PROPERTY OF USA SHADE AND FABRIC STRUCTURES AND SHALL NOT BE REPRODUCED WITHOUT THEIR WRITTEN

USASHADE & Fabric Structures®

CORPORATE HEADQUARTERS
2580 ESTERS BLVD. SUITE 100
DFW AIRPORT, TX, 75261
800-966-5005

CERTIFICATIONS:
IAS CERTIFICATION No: FA-428
CLARK COUNTY MANUFACTURER CERTIFICATION NUMBER (NEVADA): 355

CUSTOMER:
Lake Elsinore U.S.D.

PROJECT NAME:

LOCATION:
William Collier Elementary
20150 Mayhall Drive
Wildomar, CA 92595

MODEL NUMBER:

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 04-123501 PC
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑ CG ☐
DATE: 12/11/2024

STRUCTURE TYPE:

SCALE : VARIES

DRAWING SIZE: D

PRE-CHECK (PC) DOCUMENT
Code : 2022 CBC
A separate project application for construction is required.

Eng. By :	DWH	8/19/23
Design By :	DWH	8/19/23
Approved By :	DWH	8/19/23

DRAWING DESCRIPTION:

DWG. T&I FORMS

SHEET T-3.0

REV.

GENERAL NOTES

1.- SPECIAL INSPECTION REQUIREMENTS SHALL FOLLOW THE ATTACHED SAMPLE TEST AND INSPECTION LIST (T & I LIST) APPROVED BY DSA. THE SHOP WELDING INSPECTION SHALL INCLUDE WELDING OF ALL STEEL MEMBERS AND IDENTIFICATION OF STEEL THROUGH MILL CERTIFICATE OR MATERIAL TESTING, UNCERTIFIED STEEL SHALL BE TESTED TO THE REQUIREMENTS OF CBC 2022 CHAPTER 17A. THE FIELD SPECIAL INSPECTION SHALL INCLUDE COMPRESSION CYLINDER TESTS FOR THE CONCRETE FOUNDATION.

2.- STRUCTURE SHALL BE IN THE LOCATION SHOWN ON THE SITE SPECIFIC DSA APPLICATION DRAWING.

3.- FOUNDATION DESIGN BASED ON CBC 2022, TABLE 1806A.2, SOIL CLASS 5 (ALLOWABLE FOUNDATION PRESSURE 1500 PSF)

4.- DESIGN PER FOLLOWING CODES: CBC 2022 (CHAPTER 35), ASCE 7-16, AISC 360-16, AISC 341-16, ACI 318-19, ASCE 55-16 & ASCE 19-16

STRUCTURAL STEEL

1.- FABRICATION OF THE STEEL STRUCTURES SHALL BE PERFORMED BY SHADE STRUCTURES OR AN AUTHORIZED LICENSEE. MATERIAL TESTING (OR MILL CERTIFICATES) AND INSPECTION OF WELDING SHALL BE CONDUCTED PER CBC 2022 SECTIONS 1704A, 1705A, 1705A.2, AND TABLE 1705A.2.1.

2.- ONLY CALIFORNIA LICENSED CONTRACTORS AUTHORIZED BY SHADE STRUCTURES SHALL INSTALL THE SHADE STRUCTURES.

3.- ALL WORK SHALL CONFORM TO CBC 2022 EDITION, TITLE 24, CALIFORNIA CODE OF REGULATIONS (CCR)

4.- ALL GALVANIZED STEEL TUBE PRODUCTS MANUFACTURED BY ALLIED TUBE & CONDUIT FOR THIS STRUCTURE SHALL BE, AND CONFORM TO ASTM A500 GRADE C, IN ITS' ENTIRETY.
TYPICAL MECHANICAL PROPERTIES ARE:
ROUND TUBE GRADE C 50,000 PSI YIELD STRESS MINIMUM / 62,000 PSI TENSILE STRESS MINIMUM

5.- ALL STRUCTURAL SHAPES SHALL BE COLD FORMED HSS ASTM A500 GRADE C, UNLESS OTHERWISE NOTED. TYPICAL MECHANICAL PROPERTIES ACHIEVED FOR HSS PRODUCTS:
SQUARE AND RECTANGULAR 50,000 PSI YIELD STRESS / 62,000 PSI TENSILE STRESS
ROUND PIPE 50,000 PSI YIELD STRESS / 62,000 PSI TENSILE STRESS

6.- ALL PLATES PRODUCTS SHALL COMPLY WITH ASTM A572 GRADE 50.

7.- STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH A.I.S.C. SPECIFICATIONS.

8.- ALL WELDING TO CONFORM WITH AMERICAN WELDING SOCIETY STANDARDS AND SHALL BE INSPECTED BY AN AWS/CWI INSPECTOR. AWS D1.1 FOR HOT ROLLED. AWS D1.3 FOR SHEET/COLD FORMED. AWS D1.8 SEISMIC SUPPLEMENT.

9.- ALL FULL PENETRATION WELD SHALL BE CONTINUOUSLY INSPECTED PER AWS D1.1 & D1.8.

10.- SHOP CONNECTIONS SHALL BE WELDED UNLESS NOTED OTHERWISE. ALL FILLET WELDS SHALL BE A MINIMUM OF 3/16" ER70SX ELECTRODES UNLESS OTHERWISE NOTED. GMAW IS ACCEPTABLE.

11.- ALL STAINLESS STEEL BOLTS SHALL COMPLY WITH ASTM F-593, YIELD STRENGTH= 45 KSI, TENSILE STRENGTH=85 KSI MINIMUM, ALLOY GROUP 2, CONDITION CW2. ALL NUTS SHALL COMPLY WITH ASTM F-594 ALLOY GROUP 2, CONDITION CW2. REFERRING TO RCSC, ASTM F-593 IS NOT CONSIDERED AS HIGH STRENGTH BOLTS. BOLTS SHALL BE TIGHTENED TO A SNUG TIGHT CONDITION (ST).

12.- ALL STRUCTURAL STEEL (ITEMS FROM NOTE 5) SHALL BE POWDER COATED WITH ONE SHOP COAT (2.5 MILS MIN.) OF ZINC-RICH PRIMER, UNDERCOAT, AND FINISH COAT, OR EQUIVALENT PAINT SYSTEM. THIS COAT IS A WEATHER RESISTANT POWDER COATING BASED ON POLYESTER TGIC (MANUFACTURED BY SHERWIN WILLIAMS, ASKO NOBEL, PPG OR TIGER DRYLAC). TO ACHIEVE OPTIMUM ADHESION, IT IS RECOMMENDED THAT THE PROPER TREATMENT AND DRYING TAKE PLACE BEFORE COATING. POLYESTER POWDER (TGIC) SPECIFICATIONS SHALL BE AS FOLLOWS:
- PENCIL HARDNESS (ASTM D-3363). - HUMIDITY (ASTM D-2247).
- SOLVENT RESISTANCE (PCI METHOD) - 50 DBL RUBS SL. SOFTNESS.

13.- ALL STEEL ROUND TUBING (ITEMS FROM NOTE 4) SHALL BE TRIPLE COATED FOR RUST PROTECTION USING THE IN-LINE ELECTROPLATING COAT PROCESS. TUBING SHALL BE INTERNALLY COATED WITH ZINC AND ORGANIC COATINGS TO PREVENT CORROSION AS MANUFACTURED BY ALLIED TUBE & CONDUIT.

14.- ALL EXPOSED STEEL FASTENERS SHALL BE STAINLESS STEEL (TYPE 304 MINIMUM). HOT DIP GALVANIZED (ASTM A153, CLASS D MINIMUM OR ASTM F2329) AS APPLICABLE, OR PROTECTED WITH CORROSION PREVENTIVE COATING THAT DEMONSTRATED NO MORE THAN 2% OF RED RUST IN MINIMUM 1,000 HOURS OF EXPOSURE IN SALT SPRAY TEST PER ASTM B117. ZINC-PLATED FASTENERS DO NOT COMPLY WITH THIS REQUIREMENT.

CONCRETE SPECIFICATION

1.- CONCRETE SHALL BE SAMPLED AND TESTED PER CBC 2022 SECTION 1903A & SHALL BE INSPECTED PER SECTION 1903A.

2.- CONCRETE TO BE F'c= 4500 PSI, TYPE V CEMENT PLUS POZZOLAN OR SLAG CEMENT. MAXIMUM WATER/CEMENT RATIO

GRADE 60 AND TO BE Fy=
60000 PSI , MIN. GR. 60.

3.- ALL ANCHOR BOLTS SET IN NEW CONCRETE (WHEN APPLICABLE) SHALL COMPLY WITH ASTM F-1554 GRADE 36 (GALVANIZED PER ASTM A153, CLASS D MINIMUM OR ASTM F2329).
ANCHOR BOLT'S DIAMETER NEEDS TO BE AS FOLLOW:
A) ANCHOR BOLT Ø1 1/4"

4.- CERTIFIED MILL TEST REPORTS ARE TO BE PROVIDED FOR EACH SHIPMENT OF REINFORCEMENT.

5.- ALL NON-SHRINK GROUT SHALL HAVE A MINIMUM 28 DAYS COMPRESSIVE STRENGTH OF 5000 PSI, AND SHALL COMPLY THE REQUIREMENTS OF ASTM C109, ASTM C939, ASTM C1090, ASTM C1107, WHEN APPLICABLE.

6.- CONCRETE EXPOSED TO FREEZING-AND-THAWING CYCLES SHALL BE AIR ENTRAINED PER ACI 318 SECTION 19.3.3.

FABRIC SPECIFICATION

1.- FABRIC SHALL BE MANUFACTURED BY MULTIKNIT LTD., WHICH MEETS THE SPECIFICATIONS LISTED ON PAGE 2000, AND SHALL BE FABRICATED FROM POLYETHYLENE MATERIALS. MINIMUM SEAM LENGTH 3/4".

2.- THE FABRIC SHALL RETAIN 80% OF ITS TENSILE AND TEARING STRENGTH AFTER ULTRAVIOLET EXPOSURE PER ASTM G53 USING A 313 NM LIGHT SOURCE FOR 500 HOURS WHILE MOISTENED FOR 1 HOUR EVERY 12 HOURS.

3.- PROVIDE CERTIFICATION BY MANUFACTURER AND STATE FIRE MARSHAL TO SCHOOL'S DISTRICT INSPECTOR OF RECORD AT SITE SPECIFIC INSTALLATION. COPY OF FIRE CERTIFICATION SHALL BE SENT TO DSA.

4.- FABRIC SHALL REQUIRE ANNUAL INSPECTION AND MAINTENANCE BY THE DISTRICT. FIRE TEST ON FABRIC: NFPA 701 TEST 2 AND ASTM E 84 EXTENDED 30 MINUTES TEST, FLAME SPREAD INDEX (FSI): 10. SMOKE DEVELOPED INDEX (SDI): 50. FABRIC IS ACCEPTABLE FOR USE IN WILDLIFE URBAN INTERFACE AREA.

5.- FABRIC TOP NEEDS TO BE REMOVED IF SNOW EXCEEDING 5 PSF ARE ANTICIPATED, FABRIC TOP NEEDS TO BE REMOVED IF WINDS EXCEEDING 115 MPH ARE ANTICIPATED.

6.- A VISUAL INSPECTION LOOKING FOR TEAR AND ABNORMAL WEAR IN FABRIC MATERIAL AND THREAD IS REQUIRED PRIOR TO RE-INSTALLATION. USA SHADE & FABRIC STRUCTURES SHALL BE NOTIFIED IF SIGNIFICANT DAMAGE IS PRESENT BEFORE RE-INSTALLATION.

AIRCRAFT CABLE

1.- FOR FABRIC ATTACHMENT USE 3/8" 7x19 GALV. CABLE PER ASTM A1023/A1023M, WITH A BREAKING STRENGTH VALUE OF 14,400 LBS. CABLE SHALL BE TENSIONED TO 300 LBS MINIMUM AND 500 LBS MAXIMUM.THE MAXIMUM CALCULATED CABLE ALLOWABLE CAPACITY IS Sa=4,909 LB.

2.- CABLES SHALL BE FED THROUGH THE FABRIC SLEEVES AROUND THE PERIMETER OF THE CANOPY AND TENSIONED UNTIL THE FABRIC PANELS (DESIGNED PURPOSELY UNDERSIZED) REACH A TAUT APPEARANCE. ANY LONG TERM CABLE SAG SHALL BE MINIMIZED DURING THE MAINTENANCE RE-TIGHTING VISITS AS REQUIRED.

MAXIMUM OCCUPANT LOAD (PER CBC 2022 TABLE 1604A.5)

-K-12:	250 PERSONS
-PUBLIC ASSEMBLY:	300 PERSONS
-EDUCATIONAL OCCUPANCIES ABOVE 12TH GRADE:	500 PERSONS

CBC PC DESIGN NOTES

BUILDING CODE	CBC 2022 (BASED ON IBC 2021)
FLOOR LIVE LOAD	N/A
ROOF LIVE LOAD	RLL 5 PSF

ALLOWABLE SOIL PRESSURE:

DL + LL (CONC FTG)	1500 PSF
DL + LL + SEISMIC (CONC FTG)	1500 PSF
LATERAL BEARING DESIGN VALUE	100 PSF/FT BELOW NATURAL GRADE, PER TABLE 1806A.2

TWO TIMES THE TABULAR VALUE IS USED (200 PSF/FT)
PER CBC SECTION 1806A.3.4.
ALLOWABLE PIER FRICTIONAL RESISTANCE 250 PSF MAXIMUM
BASED ON SECTION 1810A.3.3.1.4 (ONE-SIXTH OF THE BEARING VALUE).
UPLIFT FRICTIONAL RESISTANCE HAVE A SAFETY FACTOR OF 3.

ROOF SNOW LOAD	5 PSF
ICE LOAD	ZERO PSF
FLOOD HAZARD AREA	ZONE X

WHEN A SITE SPECIFIC PROJECT IS LOCATED IN A FLOOD ZONE OTHER THAN ZONE X, A LETTER STAMPED AND SIGNED FROM A SOILS ENGINEER IS NEEDED TO VALIDATE THE ALLOWABLE SOIL VALUES SPECIFIED IN THE PC ARE STILL APPLICABLE.

WIND DESIGN DIRECTIONAL PROCEDURE: ASCE 7-16, SECTION 27.3.2
NOTE:WIND DESIGN IS LIMITED TO UNOBSTRUCTED CLEAR FLOW CONDITION

-BASIC DESIGN WIND SPEED (3 SEC GUST)	V	115 MPH
-ASD WIND LOAD (CBC 2022 SEC. 1603A.1.4)	V_{ASD}	90 MPH
-WIND EXPOSURE FACTOR	C	
-TOPOGRAPHIC FACTOR	Kzt	1
-RISK CATEGORY	II	
-VELOCITY PRESSURE EXPOSURE COEFFICIENT	Kz	0.90
-VELOCITY PRESSURE	qz	25.90 PSF

SEISMIC DESIGN:
-SITE CLASS D
NOTE: UNLESS A SITE-SPECIFIC GROUND MOTION HAZARD ANALYSIS IS PERFORMED, THE SM1 VALUE INCREASED BY 50% SHALL BE LESS THAN THE DESIGN CRITERIA STATED HEREIN.

-SPECTRAL RESPONSE COEFFICIENTS	SS	3.00g
	S1	1.389g
	SDS	2.00
	SD1	1.39
-LATERAL FORCE RESISTING SYSTEM G.2 ORDINARY CANTILEVERED COLUMN SYSTEM.		
-SEISMIC IMPORTANCE FACTOR	Ie	1.0
-DESIGN BASE SHEAR AT BASE	V	18483 LB
-SEISMIC RESPONSE COEFFICIENTS	Cs	1.6
-RESPONSE MODIFICATION FACTOR	R	1.25
-ANALYSIS PROCEDURE		EQUIVALENT LATERAL FORCE
-RISK CATEGORY	II	
-SEISMIC DESIGN CATEGORY		E
-SITE COEFFICIENT CATEGORY	Fa	1.2
	Fv	1.5
-REDUNDANCY FACTOR	ρ	1.3

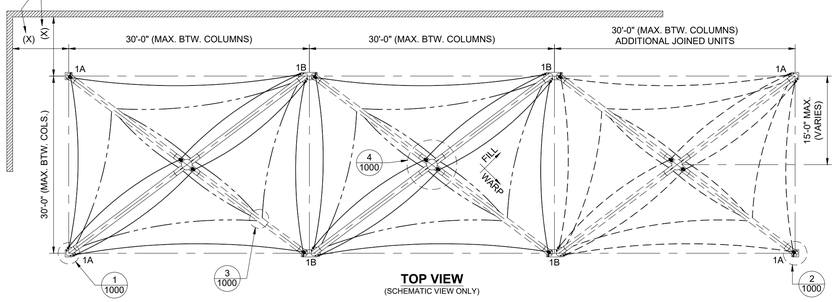
GEOHAZARD REPORT IS NOT REQUIRED FOR OPEN FABRIC STRUCTURES 1,600 SQF OR LESS COMPLYING WITH THE REQUIREMENTS OF IR A-4 SECTION 3.1.1. OPEN FABRIC SHADE STRUCTURES GREATER THAN 1,600 SQUARE FEET UP TO A MAXIMUM OF 4,000 SQUARE FEET AND COMPLYING WITH THE REQUIREMENTS NOTED IN IR A-4 SECTION 3.1.1 DO NOT REQUIRE A GEOHAZARD REPORT PROVIDED A GEOTECHNICAL REPORT INDICATES THAT NO LIQUEFACTION POTENTIAL EXISTS.

ARCHITECT OF RECORD TO DETERMINE IF SPECIFIC SITE IS IN GEOLOGIC HAZARD ZONE. GEOHAZARD REPORT REQUIREMENTS PER DSA IR A-4.

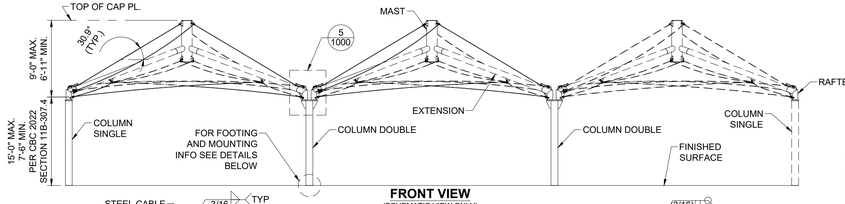
PC OPTIONS SHALL NOT INCLUDE LIQUEFIABLE SOIL (EXCEPTION: OPEN FABRIC SHADE STRUCTURES 1,600 SQUARE FEET OR LESS COMPLYING WITH REQUIREMENTS OF IR A-4 SECTION 3.1.1). IF STRUCTURE IS LOCATED IN AN AREA WITH LIQUEFIABLE SOIL OR SITE CLASS F, OVER-THE-COUNTER SUBMITTAL IS NOT ALLOWED AND REGULAR PROJECT SUBMITTAL IS REQUIRED. IF SITE IS NOT IN A MAPPED LIQUEFACTION HAZARD ZONE, IT MAY BE PRESUMED THAT NO LIQUEFACTION HAZARD EXISTS ON THAT SITE UNLESS A SITE-SPECIFIC GEOTECHNICAL REPORT IDENTIFIES SUCH HAZARD.

MINIMUM FOUNDATION SETBACK LIMIT IN ADJACENT SLOPE: THE DEPTH OF REQUIRED PIER EMBEDMENT SHALL START FROM AN ELEVATION THAT CORRESPONDS WITH A HORIZONTAL CLEAR DISTANCE OF 17'-6" FEET THAT INTERSECT WITH THE SLOPE (DAYLIGHTING). IF SETBACK LIMITS ARE SMALLER THAN CBC REQUIRES, A SITE-SPECIFIC SOILS REPORT IS REQUIRED.

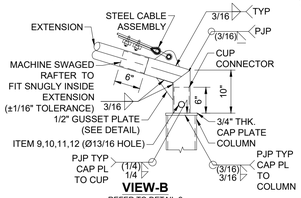
STRUCTURE SHALL BE INSTALLED A MIN. OF 20'-0" AWAY FROM ADJACENT BUILDING, UNLESS OTHERWISE APPROVED BY D.S.A. ON A JOB SPECIFIC BASIS.



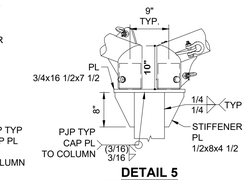
TOP VIEW
(SCHEMATIC VIEW ONLY)



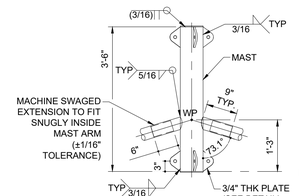
FRONT VIEW
(SCHEMATIC VIEW ONLY)



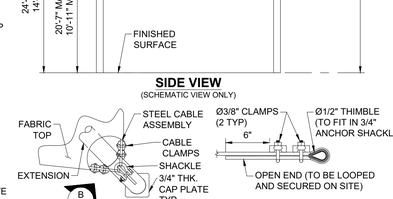
VIEW-B
REFER TO DETAIL-2



DETAIL 5
REFER TO FRONT VIEW



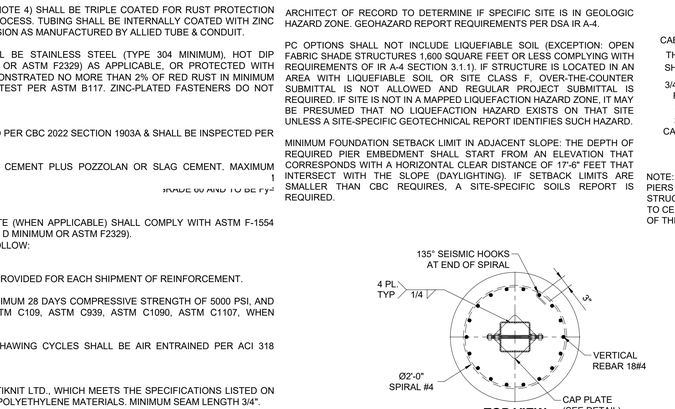
VIEW C-C
REFER TO DETAIL 4



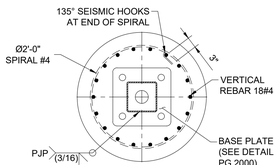
SIDE VIEW
(SCHEMATIC VIEW ONLY)

DETAIL-2
REFER TO TOP VIEW

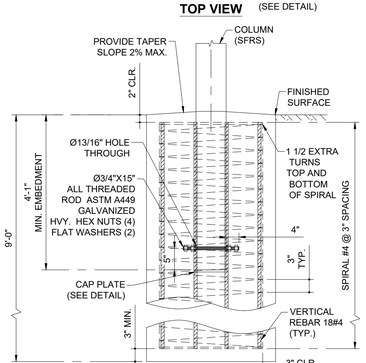
Ø3/8" CABLE ASSEMBLY
(TYPICAL)



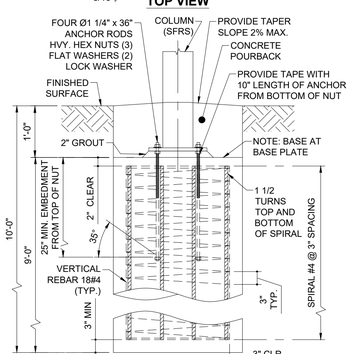
TOP VIEW



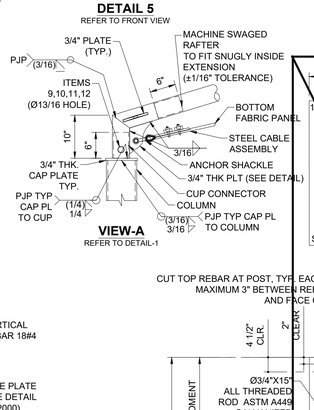
TOP VIEW



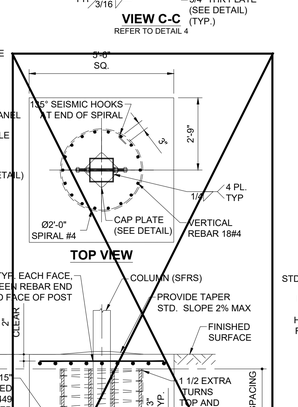
X DRILLED PIER FOOTING-PIH
(EMBEDDED, PIH)
(USE FOR NON-CONSTRAINED CASES)



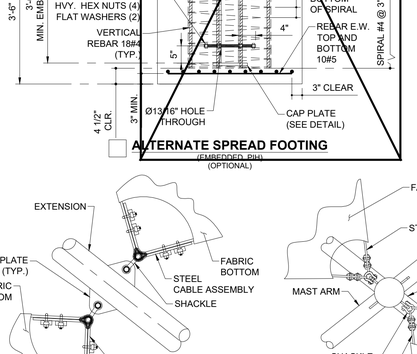
DRILLED PIER FOOTING-RBP
(RECESSED BASE PLATE, RBP)
(USE FOR NON-CONSTRAINED CASES)
(OPTIONAL)



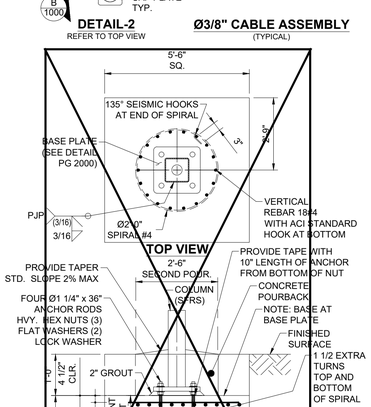
VIEW-A
REFER TO DETAIL-1



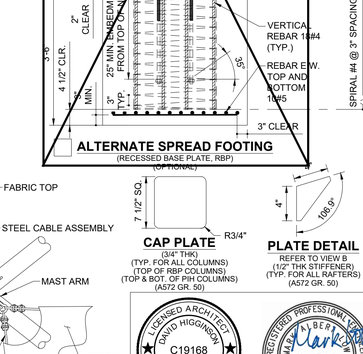
TOP VIEW



ALTERNATE SPREAD FOOTING
(EMBEDDED, PIH)
(OPTIONAL)

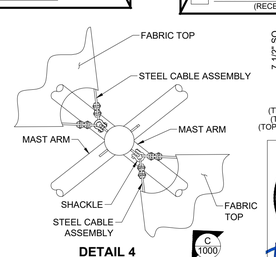


TOP VIEW



ALTERNATE SPREAD FOOTING
(RECESSED BASE PLATE, RBP)
(OPTIONAL)

DETAIL 3
REFER TO TOP VIEW



DETAIL 4
REFER TO TOP VIEW

CAP PLATE
(3/4" THK)
(TYP. FOR ALL COLUMNS)
(TOP OF RBP COLUMNS)
(TOP & BOT. OF PIH COLUMNS)
(A572 GR. 50)

PLATE DETAIL
REFER TO VIEW B
(1/2" THK STIFFENER)
(TYP. FOR ALL RAFTERS)
(A572 GR. 50)

LIST OF MATERIALS

ITEM	QTY	DESCRIPTION	MATERIAL
1A	TBD	COLUMN SINGLE	HSS 7 x 7 x 0.250
1B	TBD	COLUMN DOUBLE	HSS 7 x 7 x 0.250
2	TBD	CUP CONNECTOR (6" LG)	HSS 5.0 x 0.375
2A	TBD	RAFTER M1	HSS 5.563 x 0.258
2B	TBD	RAFTER M2	HSS 5.563 x 0.258
3A	TBD	EXTENSION M1	HSS 5.563 x 0.258
3B	TBD	EXTENSION M2	HSS 5.563 x 0.258
4	TBD	MAST	HSS 10.75 x 0.375
5A	TBD	TOP FABRIC PANEL	FR COLOURSHADE 190/F5
5B	TBD	TOP FABRIC PANEL	FR COLOURSHADE 190/F5
6A	TBD	BOTTOM FABRIC PANEL	FR COLOURSHADE 190/F5
6B	TBD	BOTTOM FABRIC PANEL	FR COLOURSHADE 190/F5
7A	TBD	Ø3/8" CABLE (TOP FABRIC)	GALVANIZED STEEL
7B	TBD	Ø3/8" CABLE (BOTTOM FABRIC)	GALVANIZED STEEL
8	TBD	Ø3/8" CABLE CLAMP	GALVANIZED STEEL
9	TBD	Ø3/4"-10NC x 7" HEX BOLT (ST)	316 SS
10	TBD	Ø3/4"-10NC HEX NUT	316 SS
11	TBD	Ø3/4" SPLIT LOCK WASHER	316 SS
12	TBD	Ø3/4" FLAT WASHER	316 SS
13	TBD	3/4" ANCHOR SHACKLE	GALVANIZED
14	TBD	Ø1/2" THIMBLE	GALVANIZED

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 04-125584 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 09/01/2026

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USASHADE & Fabric Structures
CORPORATE HEADQUARTERS
2580 ESTERS BLVD. SUITE 100
DFW AIRPORT, TX, 75261
800-966-5005

CERTIFICATIONS:
IAS CERTIFICATION No: FA-428
CLARK COUNTY MANUFACTURER CERTIFICATION NUMBER (NEVADA): 355

CUSTOMER:
Lake Elsinore U.S.D.

PROJECT NAME:
William Collier Elementary

LOCATION:
20150 Mayhall Drive
Wildomar, CA 92595

MODEL NUMBER:
DSA407J3060-22

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 04-122501 PC
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑ CG ☐
DATE: 12/11/2024

STRUCTURE TYPE:
MARINER PEAK JOINED DSA

SIZE: MAXIMUM
30' x 133' x 15'e MAX.

SCALE : NONE

DRAWING SIZE:
D

PRE-CHECK (PC) DOCUMENT
Code : 2022 CBC
A separate project application for construction is required.

Eng. By :	HH	12/01/22
Design By :	OS	12/01/22
Approved By :	MB	12/01/22

DRAWING DESCRIPTION:
PRODUCT INFORMATION

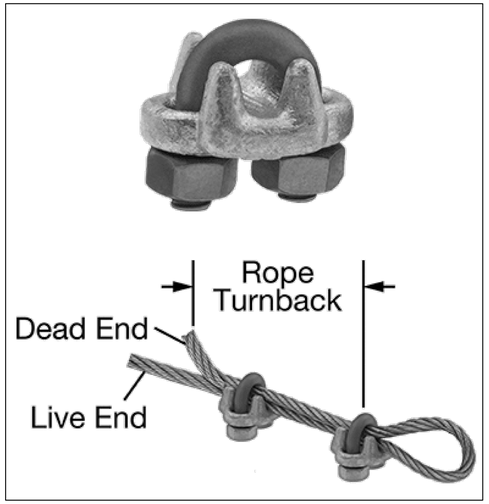
DWG.
DSA407J3060-22

SHEET
19.1-1000

REV.
NC

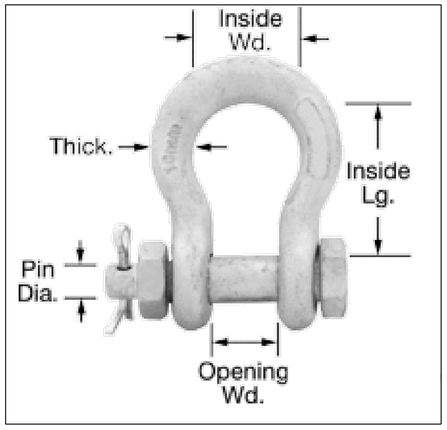
LICENSED ARCHITECT DAVID HIGGINSON C19168 10-31-25 RENEWAL DATE STATE OF CALIFORNIA
8/19/24

REGISTERED PROFESSIONAL ENGINEER MARK BERNARD STRUCTURAL No. 3693 STATE OF CALIFORNIA
6/28/2024



FORGED WIRE ROPE CLAMP

FITTING TYPE ROPE CLAMP
FABRICATION: FORGED
MATERIAL: GALVANIZED STEEL
FOR WIRE ROPE DIAMETER 3/8"
NUMBER OF CLAMPS REQUIRED: 2
ROPE TURNBACK: 6 1/2"
FOR WIRE ROPE CONSTRUCTION 7 × 19
ATTACHMENT TYPE: LOOP
CLAMP:WIDTH 2", HEIGHT 1 15/16", THICKNESS 1 11/16"
REQUIRED INSTALLATION TOOL TORQUE WRENCH
REQUIRED TORQUE 45 FT.-LBS.
CAPACITY 80% OF THE ROPE'S CAPACITY
SPECIFICATIONS MET ASME B30.26, FED. SPEC. FF-C-450

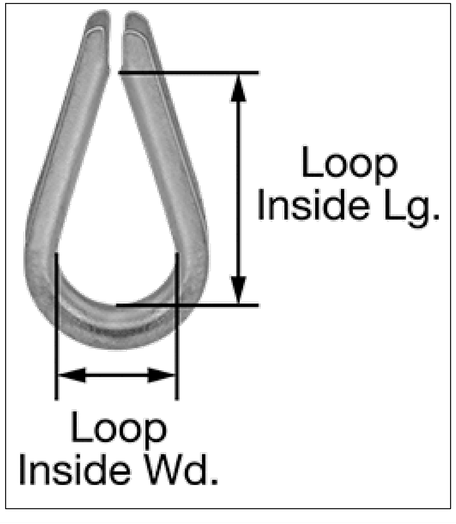


3/4" GALVANIZED STEEL SAFETY-PIN SHACKLE

MATERIAL: GALVANIZED STEEL
THICKNESS: 3/4"
OPENING WIDTH: 1 1/4"
PIN DIAMETER" 29/32"
INSIDE LENGTH: 2 13/16"
INSIDE WIDTH: 2"
CAPACITY: 10,400 LBS.
FABRICATION: FORGED
PIN TYPE: SAFETY
SPECIFICATIONS MET ASME B30.26, FED. SPEC. RR-C-271F
FITTING TYPE: SHACKLE
APPLICATION: FOR LIFTING
ATTACHMENT TYPE: CLEVIS

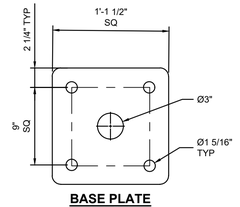
A BOLT FASTENED WITH A NUT AND COTTER PIN MAKES THESE SHACKLES MORE SECURE THAN SCREW-PIN SHACKLES. ALSO KNOWN AS ANCHOR AND BOW SHACKLES, THE WIDE BODY PROVIDES ROOM TO ATTACH MULTIPLE CONNECTORS.

GALVANIZED STEEL SHACKLES HAVE A THICK COATING FOR CORROSION RESISTANCE.

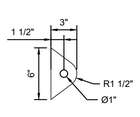


WIRE ROPE THIMBLE

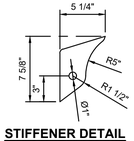
FITTING TYPE: THIMBLE
MATERIAL: GALVANIZED STEEL
FOR WIRE ROPE DIAMETER: 1/2"
LOOP
INSIDE LENGTH: 1 7/8"
INSIDE WIDTH: 1 1/8"
SPECIFICATIONS MET FED. SPEC. FF-T-276B



BASE PLATE
(1 1/4" THK)
(TYP. FOR RBP COLUMNS)



TAB PLATE DETAIL
REFER TO VIEW C-C PG 1000
(3/4" THK PLATE)
(A572 GR. 50)



STIFFENER DETAIL
REFER TO VIEW A-A PG 1000
(3/4" THK PLATE)
(A572 GR. 50)

FLAME RETARDANT

Fabric Registration

LICENSE NUMBER: F-052001

COLOURSHADE 190/F5

Product Marketed by:

MULTIKNIT (PTY) LTD
BOX 798 WHITE RIVER 1240
MPUMALANGA SOUTH AFRICA, ,

Issue Date : 04/29/2026
Expiration Date : 06/30/2027

This product meets the minimum requirements of flame resistance established by the California State Fire Marshal for products identified in Section 13115, California Health and Safety Code. The scope of the approved use of this product is provided in the current edition of the CALIFORNIA APPROVED LIST OF FLAME RETARDANT CHEMICALS AND FABRICS, GENERAL AND LIMITED APPLICATIONS CONCERNS published by the California State Fire Marshal.

Issued By Cortney Walker
Fire Engineering License Manager
Fire Engineering & Investigations Division

Reviewed and Approved By Jeff Schwartz
Acting Program Coordinator
Fire Engineering & Investigations Division

OFFICE OF THE STATE FIRE MARSHAL

Please visit uatcalfire.govmotus.org for more information on Licensing and Permitting with CAL FIRE

Page 1 of 1

Aircraft Cable

Preformed, made in accordance with commercial specifications military and federal specification rope available.

Carbon Steel (Aircraft Cable) - Galvanized cable has the highest strength and greatest fatigue life of the materials offered. It has good to fair corrosion resistance in rural to industrial atmosphere environments. This material is most widely used for small diameter cables. Tin over galvanized cable offers greater corrosion resistance and reduced friction over pulleys.



7 x 19

7 x 19		Galvanized Min.
Dia. (In)	Approx. Wt 1000 Ft/lbs	Breaking Strengths (lbs)
3/32	17.	1,000
1/8	29.	2,000
5/32	45.	2,800
3/16	65.	4,200
7/32	86.	5,600
1/4	110.	7,000
9/32	139.	8,000
5/16	173.	9,800
3/8	243.	14,400

190/F5 Fire rated specifications

Multiknit INTERNATIONAL

Standard range

Revision 0 28-Oct-12

Colour	Shade %	UV Block %	Average GSM	Average Warp break strength kgs	Average Elongation %	Average Weft break strength kgs	Average Elongation %	Average Burst Kpa	Average Burst to Mass ratio
Desert Sand	80	92	185	50	40	72	73	156	0.84
Blue	80	85	185	50	40	72	73	156	0.84
Brown	85		185	50	40	72	73	156	0.84
Green	80	85	185	50	40	72	73	156	0.84
Red	80	86	185	50	40	72	73	156	0.84
Silver	80	81	185	50	40	72	73	156	0.84
Terracotta	75	82	185	50	40	72	73	156	0.84
Yellow	80	89	185	50	40	72	73	156	0.84
				110 LB		159 LB		3258 PSF	

CONVERSION TO IMPERIAL UNITS:
185 GSM = .0378 psf
50 KGS = 110 Lb
72 KGS = 159 Lb
156 Kpa = 3258 psf

Notes:
- 190/F5 conforms to The California State Fire Marshal Title 19 Test for Small scale Fabrics
- Tear tests are done using a 50mm wide strip and a cross head speed of 500mm/min
- This report has been compiled using the mean results from all tests conducted on the given sample by our Quality Control Laboratory. the information provided is considered to be a good reflection of the relevant properties of the fabric tested. These results must only be used as an indication of the quality and characteristics of the fabric tested.
Company cannot be held responsible or liable in any way whatsoever should this information differ to that of a registered testing institution.

pp.
Deon Joubert
General Manager - Multiknit (Pty) Ltd

Tommy Rogers
Managing Director - Multiknit (Pty) Ltd

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USASHADE & Fabric Structures
CORPORATE HEADQUARTERS
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800-966-5005

CERTIFICATIONS:
IAS CERTIFICATION No: FA-428
CLARK COUNTY MANUFACTURER CERTIFICATION NUMBER (NEVADA): 355

CUSTOMER:
Lake Elsinore U.S.D.

PROJECT NAME:
William Collier Elementary

LOCATION:
20150 Mayhall Drive
Wildomar, CA 92595

MODEL NUMBER:
DSA407J3060-22

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REVIEWED FOR
SS ☑ FLS ☑ ACS ☑ CG ☐
DATE: 12/11/2024

STRUCTURE TYPE:
MARINER PEAK JOINED DSA

SIZE: **MAXIMUM**
30' x 133' x 15'e MAX.

SCALE : NONE

DRAWING SIZE:
D

PRE-CHECK (PC) DOCUMENT
Code : 2022 CBC
A separate project application for construction is required.

Eng. By :	HH	12/01/22
Design By :	OS	12/01/22
Approved By :	MB	12/01/22

DRAWING DESCRIPTION:
SPECIFICATIONS

DWG.
DSA407J3060-22

SHEET
19.2-2000

REV.
NC

LICENSED ARCHITECT
DAVID HIGGINDON
C19168
10-31-25
RENEWAL DATE
STATE OF CALIFORNIA
8/19/24

REGISTERED PROFESSIONAL ENGINEER
MARK ALBERT BERNSTEIN
No. 3693
STRUCTURAL
STATE OF CALIFORNIA
6/28/2024

William Collier Elementary School Shade Structure and Playground Improvements

tBP Project No. 24006.00
DSA #04 – 125584 File # 33-15
Bid No:

Lake Elsinore Unified School District
Lake Elsinore, California

PROJECT MANUAL

Divisions 00 - 33
August 2026

Architect:
tBP/Architecture
4611 Teller Ave. Newport Beach, CA 92660-2104
949. 673. 0300

tBP
Architecture
Planning
Interiors
Management

SECTION 00 01 01
PROJECT TITLE PAGE

WILLIAM COLLIER ES SHADE STRUCTURE AND PLAYGROUND IMPROVEMENTS

DISTRICT

LAKE ELSINORE UNIFIED SCHOOL DISTRICT

545 CHANEY STREET, LAKE ELSINORE, CA 92530

951.253.7000

WWW.LEUSD.K12.CA.US

PROJECT LOCATION

WILLIAM COLLIER ELEMENTARY SCHOOL

20150 MAYHALL DRIVE

WILDOMAR, CALIFORNIA 92595

PREPARED BY:

ARCHITECT

TBP/ARCHITECTURE

4611 Teller Avenue, Newport Beach, CA 92660

949.673.0300

www.tbparchitecture.com

Architect's Project Number: 24006.00.

NOTICE: This Project Manual, is an unpublished instrument of service of the authors. It is prepared for use only on this Project and in conjunction with the authors' interpretations, observations, decisions and administration, as described in the Conditions of the Contract. Desired results without these services cannot be assured. Use in whole or in part, without the authors' services and expressed written consent may violate Act 17 U.S.C. par. 301 (1991).

END OF PROJECT TITLE PAGE

SECTION 00 01 02
PROJECT INFORMATION

PART 1 GENERAL

1.01 PROJECT IDENTIFICATION

A. Architect's Project Number: 24006.00.

William Collier Elementary School.

20150 Mayhall Drive.

Wildomar, California 92595.

B. The Owner, hereinafter referred to as District:

Lake Elsinore Unified School District

545 Chaney Street, Lake Elsinore, CA 92530

Owner's Address

951.253.7000

1.02 NOTICE TO PROSPECTIVE BIDDERS

A. These documents constitute an Invitation to Bid to and request for qualifications from General Contractors for the construction of the project described below.

1.03 PROJECT DESCRIPTION

A. Summary Project Description: removal and replacement of existing playground and shade structure.

B. Contract Scope: Construction, demolition, and renovation.

C. Contract Terms: Lump sum (fixed price, stipulated sum).

1.04 PROJECT CONSULTANTS

A. The Architect, hereinafter referred to as Architect: **tBP/Architecture**

4611 Teller Avenue, Newport Beach, CA 92660

www.tbparchitecture.com

949.673.0300

1.05 PROCUREMENT TIMETABLE

A. Last Request for Substitution Due: 14 days prior to due date of bids. Unless stated otherwise in Bid Documents.

B. Last Request for Information Due: 14 days prior to due date of bids. Unless stated otherwise in Bid Documents.

C. Contract Time: To be stated in bid documents.

D. The District reserves the right to change the schedule or terminate the entire procurement process at any time.

1.06 PROCUREMENT DOCUMENTS

A. Availability of Documents: Complete sets of procurement documents may be obtained:

1. From District at the Project Manager's address listed above.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 04-125584 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 09/01/2026

SECTION 00 01 07
SEALS PAGE

ARCHITECT OF RECORD (AOR)

TBP/ARCHITECTURE

4611 Teller Avenue, Newport Beach, CA 92660

Hung Cheng C-34187



ELECTRICAL ENGINEER OF RECORD (EEOR)

YOWANTO ENGINEERING, INC.

2705 N. Towne Avenue #C, Pomona, CA 91767

Irwan Yowanto, P.E., LC, RCDD

CIVIL ENGINEER OF RECORD (CEOR)

FPL & ASSOCIATES

30 Corporate Park, Suite 401, Irvine, California 92606

Alan Wing-Chi Lee, CE C-34971



END OF SECTION

SECTION 00 01 10
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PROCUREMENT AND CONTRACTING REQUIREMENTS

DIVISION 00 -- PROCUREMENT AND CONTRACTING REQUIREMENTS

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00 01 02 - Project Information

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00 01 10 - Table of Contents

00 40 25 - Request for Information (PreBid)

00 43 25 - Substitution Request Form - During Procurement

00 63 25 - Substitution Request Form - During Construction

The provisions in the following Division 01 Sections are subject to the provisions of all Division 00 Documents, including the Contract Agreement, General Conditions, and cannot contradict (but can supplement) Division 00 Documents.

"Substantial Completion" is the same as “Final Inspection” in this project manual.

SPECIFICATIONS

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01 30 00 - Administrative Requirements

01 30 00.01 - Request for Interpretation (Information)

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01 41 00 - Regulatory Requirements

01 45 33 - Code-Required Special Inspections and Procedures

01 50 00 - Temporary Facilities and Controls

01 57 23 - Temporary Storm Water Pollution Control

01 60 00 - Product Requirements

01 61 16 - Volatile Organic Compound (VOC) Content Restrictions

01 61 16.01 - Accessory Material VOC Content Certification Form

01 70 00 - Execution and Closeout Requirements

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01 74 19 - Construction Waste Management and Disposal
01 78 00 - Closeout Submittals
01 78 00.01 - Warranty Form Letter
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DIVISION 06 -- WOOD, PLASTICS, AND COMPOSITES
06 05 73 - Wood Treatment
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06 41 00 - Architectural Wood Casework

DIVISION 07 -- THERMAL AND MOISTURE PROTECTION
07 05 53 - Fire and Smoke Assembly Identification
07 62 00 - Sheet Metal Flashing and Trim
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DIVISION 08 -- OPENINGS
08 06 71 - Door Hardware Schedule
08 11 13 - Hollow Metal Doors and Frames
08 31 00 - Access Doors and Panels
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DIVISION 09 -- FINISHES
09 05 61 - Common Work Results for Flooring Preparation
09 21 16 - Gypsum Board Assemblies
09 22 36 - Lath
09 24 00 - Cement Plastering
09 30 00 - Tiling

09 65 00 - Resilient Flooring
09 91 13 - Exterior Painting
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10 21 13.19 - Plastic Toilet Compartments
10 28 00 - Toilet Accessories
10 73 16.13 - Metal Canopies

DIVISION 12 -- FURNISHINGS

12 36 00 - Countertops

DIVISION 13 -- SPECIAL CONSTRUCTION

13 31 00 - Fabric Structures

DIVISION 22 -- PLUMBING

22 05 18 - Escutcheons for Plumbing Piping
22 05 23 - General-Duty Valves for Plumbing Piping
22 05 29 - Hangers and Supports for Plumbing Piping and Equipment
22 05 53 - Identification for Plumbing Piping and Equipment
22 07 19 - Plumbing Piping Insulation
22 11 16 - Domestic Water Piping
22 11 19 - Domestic Water Piping Specialties
22 13 16 - Sanitary Waste and Vent Piping
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22 33 00 - Electric, Domestic-Water Heaters
22 42 13 13 - Commercial Water Closets
22 42 16 13 - Commercial Lavatories

DIVISION 23 -- HEATING, VENTILATING, AND AIR-CONDITIONING (HVAC)

23 05 29 - Hangers and Supports for HVAC Piping and Equipment
23 05 53 - Identification for HVAC Piping and Equipment
23 05 93 - Testing, Adjusting, and Balancing for HVAC
23 07 13 - Duct Insulation
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26 05 00 - Common Work Results for Electrcial

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END OF SECTION

SECTION 00 40 25
REQUEST FOR INFORMATION (PREBID)

RFI NUMBER: _____ DATE: _____

PROJECT NAME: WILLIAM COLLIER ES SHADE STRUCTURE AND PLAYGROUND IMPROVEMENTS
PROJECT NO.: 24006.00

TO: TBP/ARCHITECTURE
4611 Teller Avenue, Newport Beach, CA 92660
Attention: _____
Contractor: _____
Address: _____

Request By: _____ Date: _____

BRIEF SUMMARY OF RFI:

Drawing No. _____ Detail No. _____

Specification Section No. __ __ __ Title _____

Article / Paragraph _____ Page _____

DETAILS OF THIS RFI:

Attachments:

RESPONSE WILL BE INCLUDED IN AN ADDENDUM

END OF RFI

SECTION 00 43 25
SUBSTITUTION REQUEST FORM - DURING PROCUREMENT

SUBSTITUTION REQUEST NO. _____

DATE: _____

The provisions in this Division 00 Document are subject to the provisions of all Division 00 Documents, including the Contract Agreement, General Conditions, and cannot contradict (but can supplement) Division 00 Documents.

PROJECT NAME: WILLIAM COLLIER ES SHADE STRUCTURE AND PLAYGROUND IMPROVEMENTS

PROJECT NUMBER: 24006.00

TO: TBP/ARCHITECTURE

4611 Teller Avenue, Newport Beach, CA 92660

From: _____

We hereby submit for your consideration the following product comparisons of the specified product and the proposed substitution. The undersigned fully understands that failure to answer any item below may be cause for rejection of request for substitution.

Request for substitution shall only be made during bidding (not later than 7 days prior to bid opening for inclusion by Addendum) except under conditions beyond control of Contractor.

SPECIFIED PRODUCT: _____

Specification Section No. __ __ __ Title _____

Article / Paragraph _____ Page _____

Drawing No. _____ Detail No. _____

PROPOSED SUBSTITUTION: _____

Manufacturer: _____ Tel: _____

A. Is the point-by-point comparative data attached? **REQUIRED BY A/E** - No__ Yes__

B. Reason request for substitution is being submitted:

DIFFERENCES BETWEEN PROPOSED SUBSTITUTION AND SPECIFIED PRODUCT

A. Does proposed substitution affect in any way the Structural Safety, Access Compliance, or Fire & Life Safety portions of the project? No__ Yes__

Explain:

B. Does proposed substitution affect dimensions, gages, weights, etc. on Drawing? No__ Yes__

Explain:

C. Does proposed substitution require changes in Drawings or design and installation changes? No___ Yes___ *(If yes, cost of Architect and Engineer document changes are the responsibility of the Contractor.*)

Explain:

D. Does proposed substitution affect product cost, delivery time, or construction schedule? No___Yes___ Explain _____

E. Does proposed substitution comply with specified ICC Number, UL Rating, ASTM Numbers? No___ Yes___ Explain _____

F. Does proposed substitution affect other trades and systems such as wiring, piping, ductwork, structure, etc.? No ____ Yes ____ (*Explain which and how*)

G. Does proposed substitution product guarantee differ from that of the specified product? No___ Yes___ Explain

Attach a listing of 3 similar projects (one in service for at least 3 years) using the proposed substitution.

Substantiating Data: Attach product data/brochures and Vendor qualifications for both specified and substitute product. Provide samples for both specified and substitute products, if applicable.

Certification: Undersigned has examined Construction Documents, is familiar with specified product, understands indicated application of product, and understands design intent of the Architect caused by the requested substitution.

Submitted by: _____ _____ _____

(Type Name) (Signature) (Date)

Signature must be made by person having legal authority to bind his firm to the above terms.

END OF SECTION

SECTION 00 63 25
SUBSTITUTION REQUEST FORM - DURING CONSTRUCTION

SUBSTITUTION REQUEST NO. _____

DATE: _____

The provisions in this Division 00 Document are subject to the provisions of all Division 00 Documents, including the Contract Agreement, General Conditions, and cannot contradict (but can supplement) Division 00 Documents.

PROJECT NAME: WILLIAM COLLIER ES SHADE STRUCTURE AND PLAYGROUND IMPROVEMENTS

PROJECT NUMBER: 24006.00

TO: TBP/ARCHITECTURE

4611 Teller Avenue, Newport Beach, CA 92660

From: _____

We hereby submit for your consideration the following product comparisons of the specified product and the proposed substitution. The undersigned fully understands that failure to answer any item below may be cause for rejection of request for substitution.

This request for substitution form shall only be used after the end of the bidding period under conditions beyond control of Contractor.

SPECIFIED PRODUCT: _____

Specification Section No. __ __ __ Title _____

Article / Paragraph _____ Page _____

Drawing No. _____ Detail No. _____

PROPOSED SUBSTITUTION: _____

Manufacturer: _____ Tel: _____

A. Reason request for substitution is being submitted:

DIFFERENCES BETWEEN PROPOSED SUBSTITUTION AND SPECIFIED PRODUCT

A. Does proposed substitution affect in any way the Structural Safety, Access Compliance, or Fire & Life Safety portions of the project? No__ Yes__

Explain

B. Does proposed substitution affect dimensions, gages, weights, etc. on Drawing? No__ Yes__

Explain

C. Does proposed substitution require changes in Drawings or design and installation changes? No___ Yes___ (*If yes, cost of Architect and Engineer document changes are the responsibility of the Contractor.*)

Explain:

D. Does proposed substitution affect product cost, delivery time, or construction schedule? No___Yes___ Explain _____

E. Does proposed substitution comply with specified ICC Number, UL Rating, ASTM Numbers? No___ Yes___ Explain _____

F. Does proposed substitution affect other trades and systems such as wiring, piping, ductwork, structure, etc.? No ____ Yes ____ (*Explain which and how*)

1. If yes, has impact on their work been included in price of proposed substitution? No__ Yes__.

G. Does proposed substitution product guarantee differ from that of the specified product? No___ Yes___ Explain

If the substitution request is accepted, it will result in:

No cost impact ____ Improve Schedule ____ Credit of $_____

Attach a listing of 3 projects (one in service for at least 3 years) using the proposed substitution.

Substantiating Data: Attach product data/brochures and Vendor qualifications for both specified and substitute product. Provide samples for both specified and substitute products, if applicable.

Certification: Undersigned has examined Construction Documents, is familiar with specified product, understands indicated application of product, and understands design intent of the Architect caused by the requested substitution.

Submitted by: _____ _____ _____

(Type Name) (Signature) (Date)

Signature must be made by person having legal authority to bind his firm to the above terms.

Architect's Comments:

____	Accepted	____	Accepted as Noted	____	Not Accepted	____	Received too Late

Reviewed by:

Architect: _____ Date: _____

District: _____ Date: _____

Division of the State Architect: _____ Date: _____

SECTION 01 10 00
SUMMARY

PART 1 GENERAL

1.01 PROJECT

A. Project Name: William Collier ES Shade Structure and Playground Improvements

B. District's Name: Lake Elsinore Unified School District.

C. Architect's Name: tBP/Architecture.

D. The Project consists of the construction of removal and replacement of existing playground and shade structure.

1.02 CONTRACT DESCRIPTION

A. Contract Type: Multiple prime contracts each based on a Stipulated Price as described in District Contractor Agreement.

1.03 SUMMARY

A. GC to provide:

1. Demo of existing play equipment *(likely not part of the scope needed for this project at William Collier ES)*
2. Excavation/Grading in the play pit (8" below grade) with max 2% grade in any direction throughout)
3. Access for a tractor into the play pit
4. Any new Concrete like Curbing around entire perimeter, sidewalks, ramps, retaining walls, etc…

B. Owner Vendor Dave Bang Associates will be providing the following:

1. Play Equipment with Footings and Installation
2. Rubberized Poured-In-Place Safety Surfacing (PIP)
3. Compacted Subbase (CMB unless Class II)

1.04 CONTRACT DOCUMENTS

A. Contract Requirements:

1. General Conditions of the Contract with the District are separate from Division 01 - General Requirements in the Project Manual.
   a. Such "General Conditions" documents are how the Contractor works with the District, not Specifications.
2. Division 01 - General Requirements describes the relationship of how the Architect works with the Contractor through the District and governing agencies (Division of the State Architect).
3. Specifications are found in the various Divisions of the Project Manual.

B. Contract Drawings: The Drawings provided with and identified in the Project Manual are the Drawings referenced in the Agreement.
    1. The location, extent and configuration of the required construction and improvements are shown and noted on Drawings.
        a. The Drawings are referenced in the Agreement.
        b. An index of Drawings is included in the set of Drawings.
    2. Drawings are arranged into series according to design discipline. Such organization and all references to trades, subcontractor, specialty contractor or supplier shall not control the Contractor in dividing the Work among subcontractors or in establishing the extent of the Work to be performed by any trade.
    3. Where the terms "as shown", "as indicated", "as noted", "as detailed", "as scheduled", or terms of like meaning, are used in the Drawings or Specifications, it shall be understood that reference is being made to the Drawings referenced in the Agreement.
    4. Where reference to the word "plans" is made anywhere in Drawings, Specifications and related Contract Documents, it shall be understood to mean the Drawings referenced in the Agreement.

C. Contract Specifications: The Specifications provided in the Project Manual are the Specifications referenced in the Agreement.
    1. Specifications are organized by Divisions and Sections in accordance with the recommended practices of the Construction Specifications Institute.
        a. Such organization shall not control the Contractor in dividing the Work among subcontractors or in establishing the extent of Work to be performed by any trade.
    2. Specifications are included in the Project Manual, which may also include other Bidding and Contract Documents.
        a. Contents of the Project Manual are listed in Document 00 01 10 - Table of Contents, in the Project Manual.

1.05 DESCRIPTION OF ALTERATIONS WORK

A. Scope of demolition and removal work is indicated on drawings and specified in Section 02 41 00.
    1. Intent: These drawings and specifications are the work scope of the alteration, rehabilitation, or reconstruction to be in accordance with Title 24, CCR. Should any existing conditions such as deterioration or non-complying construction be discovered which is not covered by the contract documents wherein the finished work will not comply with Title 24 CCR, a construction change document (CCD) or a separate set of plans and specifications detailing and specifying the required work shall be submitted to and approved by DSA before proceeding with the work (Section 4-317(c), Part 1, Title 24 CCR).

B. Scope of alterations work is indicated on drawings.

C. Plumbing: Alter existing system and add new construction, keeping existing in operation.

D. HVAC: Alter existing system and add new construction, keeping existing in operation.

E. Electrical Power and Lighting: Alter existing system and add new construction, keeping existing in operation.

F. Fire Alarm: Alter existing system and add new construction, keeping existing in operation.

1.06 WORK BY DISTRICT

A. District has awarded a contract for supply and installation of playground equipment and resilient surfacing which will commence on completion of site demolition and preparation.

B. Concurrent Work Under Separate Contracts:

1. Work Under Separate Contracts: District may award separate contracts for products and installation for improvements and other work as may be indicated on Drawings as NIC (Not in Contract).

2. Relationship to Work Under the Contract:

a. Work under the Contract include all provisions necessary to make such concurrent work under separate contracts complete in every respect and fully functional, including field finishing.

b. Provide necessary backing, supports, piping, conduit, conductors and other such provisions from point of service to point of connection, as shown on Drawings and specified herein.

3. Related Contract Documents:

a. District will make available, in a timely manner, drawings and specifications of work under separate contracts for coordination and further description of that work.

b. Such drawings and other data required for the coordination of the work of separate contracts with the Work of this Contract may be included with the Contract Documents.

c. If so, they are provided for convenience only and are not to be considered Contract Documents produced by Architect or Architect's consultants.

4. Permits, Notices and Fees:

a. Permits, Notices and Fees: Notices required by and approvals required of authorities having jurisdiction for work under separate contracts and related fees will be solely the responsibility of District.

C. Items noted NIC (Not in Contract) will be supplied and installed by District after Date of Final Inspection.

D. OFCI District will supply the following for installation by Contractor:

1. District may furnish, for installation by Contractor, products which are identified on the Drawings and in the Specifications as OFCI (Owner-Furnished/Contractor-Installed).

E. Relationship to Work Under the Contract:

1. Work under the Contract includes all provisions necessary to fully incorporate such products into the Work, including, as necessary.

a. Fasteners.

b. Backing,.

c. Supports.

d. Piping.

e. Conduit.

f. Conductors.

g. Other such provisions from point of service to point of connection, for a complete installation.

h. Field finishing, as shown on Drawings and specified herein.

2. See Section 01 30 00 - Administrative Requirements for additional requirements.

1.07 OWNER OCCUPANCY

A. District intends to continue to occupy adjacent portions of the existing site and/or building during the entire construction period.

B. District intends to occupy the Project by the date stated in the Agreement as the contract completion date.

C. Cooperate with District to minimize conflict and to facilitate District's operations.

D. Schedule the Work to accommodate District occupancy.

1.08 CONTRACTOR USE OF SITE AND PREMISES

A. Construction Operations: Limited to areas noted on Drawings.

1. Locate and conduct construction activities in ways that will limit disturbance to site.

B. Arrange use of site and premises to allow:

1. District occupancy.

2. Work by Others.

3. Work by District.

C. Provide access to and from site as required by law and by District:

1. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.

2. Site Access:

a. Limit access to site to indicated routes and access points as indicated.

b. If routes and access points are not indicated, access shall be as approved by District.

c. Do not restrict access to adjacent properties and do not restrict access for those performing work under separate contracts for the District.

3. Do not obstruct roadways, sidewalks, or other public ways without permit.

4. Construction Limit:

a. Limit construction activities to areas indicated on Drawings as Project Area or, if not indicated, to areas within the parcel as described in the legal description on the Drawings.

b. Refer also to Section 01 50 00 - Temporary Construction Facilities and Controls for additional requirements.

D. Existing building spaces may not be used for storage.

E. Time Restrictions:

1. Limit conduct of especially noisy, malodorous, and dusty exterior work to the hours of those required by local statute or the Agreement.

F. Utility Outages and Shutdown:

1. Limit disruption of utility services to hours the building is unoccupied.
2. Do not disrupt or shut down life safety systems, including but not limited to fire sprinklers and fire alarm system, without 7 days notice to District and authorities having jurisdiction.
3. Prevent accidental disruption of utility services to other facilities.

END OF SECTION

SECTION 01 20 00
PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedures for preparation and submittal of applications for progress payments.

B. Documentation of changes in Contract Sum and Contract Time.

C. Change procedures.

D. Correlation of Contractor submittals based on changes.

E. Procedures for preparation and submittal of application for final payment.

1.02 RELATED REQUIREMENTS

A. The provisions in this Division 01 Section are subject to the provisions of all Division 00 Documents, including the Contract Agreement, General Conditions, and cannot contradict (but can supplement) Division 00 Documents.

B. Section 01 78 00 - Closeout Submittals: Project record documents.

1.03 SCHEDULE OF VALUES

A. Use Schedule of Values Form: Form provided by District.

B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit draft to Architect for approval.

C. Submit Schedule of Values in duplicate within 15 days after date established in Notice to Proceed.

1. Submit schedule in a spreadsheet calculated format, such as Excel, based upon the attached Schedule of Values augmented by the Table of Contents of this Project Manual.

D. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the major specification section. Identify site mobilization, bonds and insurance, and record drawings .

E. Where work is separated into phases requiring separately phased payments, provide separate schedule for each phase.

F. Where work involves multiple sites and/or "A" number, provide separate schedules for each site and/or "A" number.

G. Where scope of work involves multiples buildings/structures, provide separate schedule for each building.

H. Include in each line item, the amount of Allowances specified in this section.

I. Include separately from each line item, a direct proportional amount of Contractor's overhead and profit.

J. Revise schedule to list approved Change Orders, with each Application For Payment.

1. List each authorized Change Order as an extension on the continuation sheet, listing the Change Order number and dollar value as for an original portion of Work.

1.04 APPLICATIONS FOR PROGRESS PAYMENTS

A. Payment Period: Submit at intervals stipulated in the Agreement.

1. Substantiating information will normally be required only for those portions of Work whose completion state cannot be readily determined by observation of the completed Work.

B. Use Form Form as provided by District.

C. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.

D. Forms filled out by hand will not be accepted.

E. For each item, provide a column for listing each of the following:

1. Item Number.
2. Description of work.
3. Scheduled Values.
4. Previous Applications.
5. Work in Place and Stored Materials under this Application.
6. Authorized Change Orders.
7. Total Completed and Stored to Date of Application.
8. Balance to Finish.
9. Retainage.

F. Execute certification by signature of authorized officer.

G. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored products.

H. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of work.

1. No Change Orders shall be included with Application for Payment until approved in writing by District and Architect. Also approved by DSA when appropriate.

I. Submit one electronic and no hard-copies of each Application for Payment.

J. Include the following with the application:

1. Transmittal letter as specified for submittals in Section 01 30 00.
2. Construction progress schedule, revised and current as specified in Section 01 32 16.
3. Current construction photographs specified in Section 01 30 00.
4. Partial release of liens from major subcontractors and vendors.
    a. Provide with each Application for Payment lien releases from all subcontractors, workers and materials suppliers employed for the Project covering their portion of Work to date for which payment application is made. Lien release forms will be provided by District and shall be completed in accordance with directions provided.

5. Project record documents as specified in Section 01 78 00, for review by District which will be returned to the Contractor.
6. Affidavits attesting to off-site stored products.

K. When Architect requires substantiating information, submit data justifying dollar amounts in question. Provide one copy of data with cover letter for each copy of submittal. Show application number and date, and line item by number and description.

1.05 ADDENDA

A. Addenda are changes issued prior to the signing of the Contract for Construction. These Addenda shall be signed by the Architect and approved by the Division of the State Architect per CAC Sec 4-338(b).

B. These documents may or may not have approved by the Division of the State Architect prior to the close of Bid.

1. If not approved by DSA prior to close of the bidding period, the contract price shall include the Addenda.
2. No work shall proceed regarding any Addendum until approved by DSA.
3. Revisions to Addenda, when approved by DSA, shall be incorporated by an additional addendum or Change Order as indicated below and as provided for in the Contract for Construction and General Conditions.

1.06 MODIFICATION PROCEDURES

A. Construction Changes, General:

1. The following describe administrative procedures to be followed in compliance with provisions of the Conditions of the Contract for Architect's Supplemental Instructions, Construction Change Directives, Construction Change Documents, and Contract Change Orders.
2. The Architect will prepare and issue: Architect's Supplemental Instructions, a Construction Change Directive or a Request for Proposal to be presented to the Contractor for action.

B. Submit name of the individual authorized to receive change documents and who will be responsible for informing others in Contractor's employ or subcontractors of changes to Contract Documents.

C. Contract Change Order Forms: Form as directed by District.

D. For minor changes not involving an adjustment to the Contract Sum or Contract Time, Architect will issue instructions directly to Contractor.

1. Architect's Supplemental Instructions:
   a. Minor changes in the Work, not involving an adjustment in either the Contract Sum or Contract Time, as authorized by the Conditions of the Contract, will be presented by the Architect using the Architect's Bulletin form.
   b. Should the Architect's Supplemental Instructions result in disputed costs and time adjustments, such dispute shall be resolved in accordance with the provisions of the Conditions of the Contract.

E. DSA Construction Change Document approval for substitutions and changes to structural, accessibility, or fire-life-safety portions of approved Drawings and Specifications is required from DSA prior to fabrication and installation. DSA IR A-6; CAC Section 4-215, 4-233(c), & 4-338(c).

1. The approved Construction Change Document shall be signed by:
    a. Architect of Record.
    b. When applicable:
        1) Structural Engineer of Record.
        2) Mechanical Engineer of Record.
        3) Electrical Engineer of Record.
        4) Civil Engineer of Record.
        5) Delegated Professional Engineer.
    c. Division of the State Architect for final approval.

F. For other required changes, not involving structural, accessibility, or fire-life-safety portions of approved Drawings and Specifications, Architect will issue a document signed by District instructing Contractor to proceed with the change, for subsequent inclusion in a Change Order.

1. The document will describe the required changes and will designate method of determining any change in Contract Sum or Contract Time.
2. Promptly execute the change.
3. Construction Change Directive approval is required from DSA prior to installation.
4. Construction Change Directives: In accordance with provisions of the Conditions of the Contract, the District may direct the Contractor to proceed with a change in the Work prior to formal preparation, review and agreement of a Contract Change Order, in order to not delay construction.
    a. The Architect will prepare and issue a change document containing a Construction Change Directive which, when signed by the District and the Architect, shall instruct the Contractor to proceed with a change in the Work, for subsequent inclusion in a Contract Change Order.
    b. Should the Construction Change Directive result in disputed costs and time adjustments, such dispute shall be resolved in accordance with the provisions of the Conditions of the Contract.
    c. Construction Change Directives shall follow procedures specified below for Contract Change Orders except that Contractor shall immediately proceed with the change upon receipt of the signed Change Directive.

G. For changes for which advance pricing is desired, Architect will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. Contractor shall prepare and submit a fixed price quotation within 14 days.

1. Such Request for Proposal may include an estimate of additions or deductions in Contract Time and Contract Sum for executing the change and may include stipulations regarding overtime work and the period of time the requested response from the Contractor shall be considered valid.

H. Contractor may propose a change by submitting a request for change to Architect, describing the proposed change and its full effect on the work, with a statement describing the reason for the change, and the effect on the Contract Sum and Contract Time with full documentation and a statement describing the effect on work by separate or other contractors. Document any requested substitutions in accordance with Section 01 60 00 .

1. After review of the request and with the District's approval, the Architect will prepare a change document containing a Request for Proposal, as described above.
2. Issuance of such a request by the Architect shall not indicate authorization of the Contractor to proceed with the proposed change.
3. Changes will be approved only by an approved Construction Change Directive and Contract Change Order.

I. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.

1. For change requested by Architect for work falling under a fixed price contract, the amount will be based on Contractor's price quotation.
2. For change requested by Contractor, the amount will be based on the Contractor's request for a Change Order as approved by Architect.
3. For pre-determined unit prices and quantities, the amount will be based on the fixed unit prices.
4. For change ordered by Architect without a quotation from Contractor, the amount will be determined by Architect based on the Contractor's substantiation of costs as specified for Time and Material work.

J. Substantiation of Costs: Provide full information required for evaluation.

1. On request, provide the following data:
    a. Quantities of products, labor, and equipment.
    b. Taxes, insurance, and bonds.
    c. Overhead and profit.
    d. Justification for any change in Contract Time.
    e. Credit for deletions from Contract, similarly documented.
2. Support each claim for additional costs with additional information:
    a. Origin and date of claim.
    b. Dates and times work was performed, and by whom.
    c. Time records and wage rates paid.
    d. Invoices and receipts for products, equipment, and subcontracts, similarly documented.

3. For Time and Material work, submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract.
    a. Cost and Time Resolution: If amounts for changes in Contract Sum and Contract Time cannot be agreed upon by District and Contractor, amounts shall be resolved in accordance with provisions of the Conditions of the Contract for resolution of disputes and the following:
        1) Contractor shall keep accurate records of time, both labor and calendar days, and cost of materials and equipment.
        2) Contractor shall prepare and submit an itemized account and supporting data after completion of changed Work, within the time limits indicated in the Conditions of the Contract.
        3) Contractor shall provide full information as required and requested, for District and Architect to evaluate and substantiate proposed costs and time for the change in the Work.
        4) When District and Contractor determine mutually acceptable amounts for changes in Contract Sum and Contract Time, a Contract Change Order shall be executed for these amounts.
        5) District shall have the right to audit Contractor's invoices and bid quotations to substantiate costs for Contract Change Orders.

K. Construction Changes Based on Stipulated Sum or Time: Based on the Contractor's response to a Request for Proposal or Construction Change Directive, the District and Architect will review the response.
    1. The District and Contractor shall negotiate a mutually acceptable adjustment in Contract Sum and Contract Time, as appropriate, prior to performance of the changed Work.
    2. A Contract Change Order for the stipulated amounts shall be prepared based on the stipulated sum and change in time.

L. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.
    1. When agreement is reached on changes, if any, in the Contract Time and the Contract Sum, the Contractor shall prepare a Contract Change Order using a form as directed by the District, with supplementary documents as necessary to describe the change and the associated costs and schedule impacts.
    2. Construction Change Document approval is required from DSA prior to fabrication and installation.
    3. Submit Contract Change Orders to District through the Architect.
    4. Contractor shall prepare and submit five original sets of documents for each Change Order. District, Architect and DSA shall sign the Change Order indicating acceptance and approval of the change.
        a. Structural Engineer shall also sign the Change Order, when applicable.
    5. All Change Orders must be approved by DSA prior to fabrication and installation.

6. Upon approval of the Change Order, Contractor shall promptly execute the change in the Work.

M. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.

N. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.

1. Contractor shall submit revised schedules at the next Application for Payment following approval and acceptance of the Contract Change Order.

O. Promptly enter changes in Project Record Documents.

1.07 APPLICATION FOR FINAL PAYMENT

A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.

B. Application for Final Payment will not be considered until the following have been accomplished:

1. All closeout procedures specified in Section 01 70 00.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 25 00
SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedural requirements for proposed substitutions.

1.02 RELATED REQUIREMENTS

A. The provisions in this Division 01 Section are subject to the provisions of all Division 00 Documents, including the Contract Agreement, General Conditions, and cannot contradict (but can supplement) Division 00 Documents.

B. Division 00 - Procurement and Contracting Requirements: Restrictions on timing of substitution requests.

C. Section 00 43 25 - Substitution Request Form - During Procurement: Required form for substitution requests made prior to award of contract (During procurement).

D. Section 00 63 25 - Substitution Request Form - During Construction: Required form for substitution requests made after award of contract (During construction).

E. Section 01 30 00 - Administrative Requirements: Submittal procedures, coordination.

F. Section 01 60 00 - Product Requirements: Fundamental product requirements, product options, delivery, storage, and handling.

G. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions: Restrictions on emissions of indoor substitute products.

1.03 DEFINITIONS

A. Substitutions: Changes from Contract Documents requirements proposed by Contractor to materials, products, assemblies, and equipment.

1. Substitutions for Cause: Proposed due to changed Project circumstances beyond Contractor's control.
    a. Unavailability.
    b. Regulatory changes.
2. Substitutions for Convenience: Proposed due to possibility of offering substantial advantage to the Project.
    a. Substitution requests offering advantages solely to the Contractor will not be considered.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

A. Requests by Contractor to deviate from specified requirements for products, materials, equipment, and methods, or to provide products other than those specified, shall be considered requests for substitutions except under the following conditions:

1. Substitutions are requested during the bidding period, and accepted prior to execution of the Contract. Acceptance shall be in the form of written Addendum to the Bidding documents or revision to the Drawings or Specifications for use as Construction Contract Documents.
2. Changes in products, materials, equipment, and methods of construction are directed by the District or Architect.
3. Contractor options for provision of products and construction methods are specifically stated in the Contract Documents.
4. Change in products, materials, equipment, and methods of construction is required for compliance with Codes, ordinances, regulations, orders and standards of authorities having jurisdiction.

B. Substitution Provisions: Refer to substitution provisions of the Conditions of the Contract, in addition to the requirements specified herein. Provisions for consideration and acceptance of substitutions shall be as follows:

1. Documentation:
   a. Substitutions will not be considered if they are indicated or implied on shop drawing, product data or sample submittals.
   b. All requests for substitution shall be made by separate written request from Contractor.
2. Cost and Time Considerations: Substitutions will not be considered unless a net reduction in Contract Sum or Contract Time results to the District's benefit, including redesign costs, life cycle costs, changes in related Work and overall performance of building systems.
3. Design Revision:
   a. Substitutions will not be considered if acceptance will require substantial revision of the Contract Documents or will substantially change the intent of the design, in the opinion of the Architect.
   b. The intent of the design shall include functional performance and aesthetic qualities.
4. Data: It shall be the responsibility of the Contractor to provide adequate data demonstrating the merits of the proposed substitution, including cost data and information regarding changes in related Work.
5. Determination by Architect:
   a. Architect will determine the acceptability of proposed substitutions and will notify Contractor, in writing within a reasonable time, of acceptance or rejection.

b. The determination by the Architect regarding functional performance and aesthetic quality shall be final.

6. Non-Acceptance: If a proposed substitution is not accepted, provide the specified product.
   a. If, in the opinion of the Architect, the substitution request is incomplete or has insufficient data to enable a full and thorough review of the intended substitution, the substitution may be summarily refused and determined to be unacceptable.
7. Substitution Limitation: Only one request for substitution will be considered for each product.

C. A Substitution Request for products, assemblies, materials, and equipment constitutes a representation that the submitter:
   1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product, equipment, assembly, or system.
      a. Include a signed certification that the Contractor has:
         1) Reviewed the proposed substitution and has determined that the substitution is equivalent or superior in every respect to product requirements indicated or product specified in the Contract Documents.
         2) Certify the proposed substitution is suited for and can perform the purpose or application of the specified product indicated or specified in the Contract Documents.
   2. Agrees to provide the same warranty for the substitution as for the specified product.
   3. Agrees to provide same or equivalent maintenance service and source of replacement parts, as applicable.
   4. Agrees to coordinate installation and make changes to other work that may be required for the work to be complete, with no additional cost to District.
   5. Waives claims for additional costs or time extension that may subsequently become apparent.
      a. Include a signed waiver by the Contractor for changes in the Contract Time or Contract Sum because of the following:
         1) Substitution failed to perform adequately.
         2) Substitution required changes in on other elements of the Work.
         3) Substitution caused problems in interfacing with other elements of the Work.
         4) Substitution was determined to be unacceptable by authorities having jurisdiction.
   6. Agrees to reimburse District and Architect for review or redesign services associated with re-approval by authorities.

D. A Substitution Request for specified installer constitutes a representation that the submitter:
   1. Has acted in good faith to obtain services of specified installer, but was unable to come to commercial, or other terms.

E. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents. Burden of proof is on proposer.

1. Note explicitly any non-compliant characteristics.

F. Content: Include information necessary for tracking the status of each Substitution Request, and information necessary to provide an actionable response.

1. Forms indicated and included in the Project Manual are adequate for this purpose, and must be used.

2. No specific form is required. Contractor's Substitution Request documentation must include the following:

a. Project Information:

1) Official project name and number, and any additional required identifiers established in Contract Documents.

2) District's, Architect's, and Contractor's names.

b. Substitution Request Information:

1) Discrete and consecutive Substitution Request number, and descriptive subject/title.

2) Indication of whether the substitution is for cause or convenience.

3) Issue date.

4) Reference to particular Contract Document(s) specification section number, title, and article/paragraph(s).

5) Description of Substitution.

6) Reason why the specified item cannot be provided.

7) Differences between proposed substitution and specified item.

8) Description of how proposed substitution affects other parts of work.

c. Attached Comparative Data: Provide point-by-point, side-by-side comparison addressing essential attributes specified, as appropriate and relevant for the item:

1) Physical characteristics.

2) In-service performance.

3) Expected durability.

4) Visual effect.

5) Sustainable design features.

6) Warranties.

7) Other salient features and requirements.

8) Include, as appropriate or requested, the following types of documentation:

(a) Product Data:

(b) Samples.

(c) Certificates, test, reports or similar qualification data.

(d) Drawings, when required to show impact on adjacent construction elements.

9) Include a detailed description, in written or graphic form as appropriate, indicating all changes or modifications needed to other elements of the Work and to construction to be performed by the District and by others under separate Contract with District, that will be necessary if the proposed substitution is accepted.

d. Impact of Substitution:

1) Savings to District for accepting substitution.

(a) Include detailed cost data, including a proposal for the net change, if any, in the Contract Sum.

2) Change to Contract Time due to accepting substitution.

(a) Indicate the substitution's effect on the Construction Schedule. Indicate the effect of the proposed substitution on overall Contract Time and, as applicable, on completion of portions of the Work for use by District or for work under separate contract by District.

G. Limit each request to a single proposed substitution item.

1. Submit an electronic document, combining the request form with supporting data into single document.

3.02 SUBSTITUTION PROCEDURES DURING PROCUREMENT

A. Submittal Time Restrictions:

1. District will consider requests for substitutions only if submitted at least 10 days prior to the date for receipt of bids.

B. Instructions to Bidders specifies time restrictions for submitting requests for substitutions during the bidding period, and the documents required.

C. Pursuant to Section 3400 of the Public Contract Code, requests for substitution will be considered only if received up to 7 days prior to the bid date. Subsequent requests will be considered only in the case of product unavailability, through no fault of the Contractor , or for reasons of cost reducing value analysis requested by the District .

D. Submittal Form (before award of contract):

1. Submit substitution requests by completing the form in Section 00 43 25; see this section for additional information and instructions. Use only this form; other forms of submission are unacceptable.

3.03 SUBSTITUTION PROCEDURES DURING CONSTRUCTION

A. Submittal Form (after award of contract):

1. Submit substitution requests by completing the form in Section 00 63 25; see this section for additional information and instructions. Use only this form; other forms of submission are unacceptable.

B. After Contract award, requests will be considered for cause only; in the case of product unavailability, through no fault of the Contractor , or for reasons of cost reducing value analysis requested by the District.

1. Substitutions will be considered when a product, through no fault of the Contractor, becomes unavailable or unsuitable due to regulatory change.
2. Product Availability Waiver:
    a. Substitutions will be considered after 35 day time limit only when a product becomes unavailable due to no fault of Contractor.
    b. Failure to place orders for specified products sufficiently in advance of required date for incorporation into the Work will not be considered as a valid reason for which Contractor may request a substitution or deviation from requirements of the Drawings and Specifications.
3. Waiver: At the discretion of the District, limitations on substitutions may be waived.

C. Submit request for Substitution for Cause within 14 days of discovery of need for substitution, but not later than 14 days prior to time required for review and approval by Architect, in order to stay on approved project schedule.

D. Submit request for Substitution for Convenience immediately upon discovery of its potential advantage to the project, but not later than 14 days prior to time required for review and approval by Architect, in order to stay on approved project schedule.

1. In addition to meeting general documentation requirements, document how the requested substitution benefits the District through cost savings, time savings, greater energy conservation, or in other specific ways.
2. Document means of coordinating of substitution item with other portions of the work, including work by affected subcontractors.
3. Bear the costs engendered by proposed substitution of:
    a. District's compensation to the Architect for any required redesign, time spent processing and evaluating the request.
    b. Other construction by District.
    c. Other unanticipated project considerations.

E. Substitutions will not be considered under one or more of the following circumstances:

1. When they are indicated or implied on shop drawing or product data submittals, without having received prior approval.
2. Without a separate written request.
3. When acceptance will require revisions to Contract Documents.

3.04 CONTRACT DOCUMENT REVISIONS:

A. Should a Contractor-proposed substitution or alternative sequence or method of construction require revision of the Contract Drawings or Specifications;

1. Including revisions for the purposes of determining feasibility, scope or cost, or revisions for the purpose of obtaining review and approval by authorities having jurisdiction.

2. Revisions will be made by Architect or other consultant of District who is the responsible design professional, as approved in advance by District.

B. Services of Architect or other consultant of the District, including time spent in researching and reporting on proposed substitutions or alternative sequence and method of construction, shall be paid by Contractor when such activities are considered additional services to the design services contracts of the Architect or other responsible design professional with the District.

C. Costs of services by Architect or other responsible design professional of the District shall be paid on a time and materials basis, based on current hourly fee schedules, with reproduction, long distance telephone and shipping costs reimbursable at cost plus usual and customary mark-up for handling and billing.

D. Such fees shall be paid whether or not the proposed substitution or alternative sequence or method of construction is ultimately accepted by District and a Change Order is executed.

E. Such fees shall be paid from Contractor's portion of savings, if a net reduction in Contract Sum results. If fees exceed Contractor's portion of net reduction, Contractor shall pay all remaining fees unless otherwise agreed in advance by the District.

F. Such fees owed shall be deducted from the amount owed Contractor on the Application for Payment next made following completion of revised Contract Drawings and Specifications or completion of research and other services. District will then pay Architect or other consultant of the District.

G. Certain substitutions require approval from DSA.

1. Substitutions affecting DSA-regulated items shall be considered as construction change documents (CCD's) and shall be approved by DSA prior to construction per DSA IR A-6 and Section 338(c) Part 1, Title 24 CCR. See Section 01 20 00 - Price and Payment Procedures.

3.05 RESOLUTION

A. Architect may request additional information and documentation prior to rendering a decision. Provide this data in an expeditious manner.

B. Architect will notify Contractor in writing of decision to accept or reject request.

1. Architect's decision following review of proposed substitution will be noted on the submitted form.

3.06 ACCEPTANCE

A. Accepted substitutions change the work of the Project. They will be documented and incorporated into work of the project by Change Order, Construction Change Directive, Architectural Supplementary Instructions, or similar instruments provided for in the Conditions of the Contract.

3.07 CLOSEOUT ACTIVITIES

A. See Section 01 78 00 - Closeout Submittals, for closeout submittals.

B. Include completed Substitution Request Forms as part of the Project record. Include both approved and rejected Requests.

3.08 ATTACHMENTS

A. A facsimile of the Substitution Request Form (During Construction) required to be used on the Project is included after this section.

END OF SECTION

SECTION 01 30 00
ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General administrative requirements.

B. Electronic document submittal service.

C. Preconstruction meeting.

D. Site mobilization meeting.

E. Progress meetings.

F. Contractor's daily reports.

G. Progress photographs.

H. Submittals for review, information, and project closeout.

I. Number of copies of submittals.

J. Submittal procedures.

1.02 RELATED REQUIREMENTS

A. Section 01 60 00 - Product Requirements: General product requirements.

B. Section 01 70 00 - Execution and Closeout Requirements: Additional coordination requirements.

C. Section 01 78 00 - Closeout Submittals: Project record documents; operation and maintenance data; warranties and bonds.

1. Where submittals are indicated for review by both Architect and the Commissioning Provider (CxP), submit one extra and route to Architect first for forwarding to the Commissioning Provider.

2. Where submittals are not indicated to be reviewed by Architect, submit directly to the Commissioning Provider (CxP); otherwise, the procedures specified in this section apply to commissioning submittals.

D. Technical Product Sections: Procedures for specific submittals specified in those Sections to be made at Contract closeout.

1.03 DEFINITIONS

A. Action Submittals: Written and graphic information that requires responsive action by Owner Representative and Architect or other responsible design professional.

B. Informational Submittals: Written information that does not require responsive action by Owner Representative and Architect or other responsible design professional.

C. Unsolicited Submittals: Action or informational submittals not required by the Contract Documents or not requested by the reviewer. Unsolicited submittals may be returned with notation "not reviewed."

D. Product Data: Standard published information ("catalog cuts") and specially prepared data for the Work of the Contract, including standard illustrations, schedules, brochures, diagrams, performance charts, instructions and other information to illustrate a portion of the Work.

E. Request for Interpretation or Information (RFI): A document submitted by the Contractor requesting clarification of a portion of the Contract Documents, hereinafter referred to as an RFI.

F. Samples: Physical examples that demonstrate the materials, finishes, features, workmanship and other characteristics of a portion of the Work. Accepted samples shall serve as quality basis for evaluating the Work.

G. Shop Drawings, Product Data and Samples: Instruments prepared and submitted by Contractor, for Contractor's benefit, to communicate to Architect the Contractor's understanding of the design intent, for review and comment by Architect on the conformance of the submitted information to the general intent of the design. Shop drawings, product data and samples are not Contract Documents.

H. Shop Drawings: Drawings, diagrams, schedules and illustrations, with related notes, specially prepared for the Work of the Contract, to illustrate a portion of the Work.

I. Other Submittals: Technical data, test reports, calculations, surveys, certifications, special warranties and guarantees, operation and maintenance data, extra stock and other submitted information and products shall not be considered as Contract Documents but shall be information from Contractor to Architect to illustrate a portion of the Work for confirmation of understanding of design intent.

1.04 GENERAL ADMINISTRATIVE REQUIREMENTS

A. Comply with requirements of Section 01 70 00 - Execution and Closeout Requirements for coordination of execution of administrative tasks with timing of construction activities.

B. Make the following types of submittals to Architect:

1. Requests for Interpretation or Information (RFI).
2. Requests for substitution.
3. Shop drawings, product data, and samples.
4. Test and inspection reports.
5. Design data.
6. Manufacturer's instructions and field reports.
7. Applications for payment and change order requests.
8. Progress schedules.
9. Coordination drawings.
10. Correction Punch List and Final Correction Punch List for Final Inspection.
11. Closeout submittals.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 ELECTRONIC DOCUMENT SUBMITTAL SERVICE

A. All documents transmitted for purposes of administration of the contract are to be in electronic (PDF, MS Word, or MS Excel) format, as appropriate to the document, and transmitted via an Internet-based submittal service that receives, logs and stores documents, provides electronic stamping and signatures, and notifies addressees via email.

1. Besides submittals for review, information, and closeout, this procedure applies to Requests for Interpretation or Information (RFIs), progress documentation, contract modification documents (e.g. supplementary instructions, change proposals, change orders), applications for payment, field reports and meeting minutes, Contractor's correction punchlist, and any other document any participant wishes to make part of the project record.
2. Contractor and Architect are required to use this service.
3. It is Contractor's responsibility to submit documents in allowable format.
4. Subcontractors, suppliers, and Architect's consultants are to be permitted to use the service at no extra charge.
5. Users of the service need an email address, internet access, and PDF review software that includes ability to mark up and apply electronic stamps (such as Adobe Acrobat, www.adobe.com, or Bluebeam PDF Revu, www.bluebeam.com), unless such software capability is provided by the service provider.
6. Unless specifically requested, paper document transmittals will not be reviewed; emailed electronic documents will not be reviewed.
7. All other specified submittal and document transmission procedures apply, except that electronic document requirements do not apply to samples or color selection charts.

B. Cost: The cost of the service is to be paid by Contractor; include the cost of the service in the Contract Sum.

C. Submittal Service: The selected service is:

1. Bluebeam Software Inc.; Bluebeam Revu Studio: www.bluebeam.com.
2. Other Service acceptable to both District and Architect.
    a. Direct email with PDF copies.

D. Training: One, one-hour, web-based training session will be arranged for all participants, with representatives of Architect and Contractor participating; further training is the responsibility of the user of the service.

1. Representatives of District are scheduled and included in this training.

E. Project Closeout: Architect will determine when to terminate the service for the project and is responsible for obtaining archive copies of files for District.

3.02 PRECONSTRUCTION MEETING

A. District will schedule a meeting after Notice of Award.

B. Attendance Required:

1. District.
2. Architect.
3. Contractor.
4. Owner Representative.

C. Agenda:

1. Execution of District-Contractor Agreement.
2. Submission of executed bonds and insurance certificates.
3. Distribution of Contract Documents.
4. Submission of list of subcontractors, list of products, schedule of values, and progress schedule.
5. Submission of initial Submittal schedule.
6. Designation of personnel representing the parties to Contract and Architect.
7. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
8. Scheduling.
9. Scheduling activities of a Geotechnical Engineer.

D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, District, participants, and those affected by decisions made.

3.03 SITE MOBILIZATION MEETING

A. Schedule meeting at the Project site prior to Contractor occupancy.

B. Attendance Required:

1. Contractor.
2. District.
3. Architect.
4. Construction Manager.
5. Special consultants.
6. Contractor's superintendent.
7. Major subcontractors.
8. Project Inspector of Record.
9. DSA Field Representative.

C. Agenda:

1. Designation of Key Personnel: Contractor shall designate key personnel and provide a name and address list which includes the following:

a. Contractor: Project Manager and Superintendent.

b. Major subcontractors: Principal/Project Manager and Superintendent.

c. Major materials suppliers: Contact person.

2. Distribute and discuss list of subcontractors and suppliers.

3. Project Communication Procedures: Review requirements and administrative requirements for written and oral communications.

   a. Review requirements and administrative procedures Contractor may wish to institute for identification and reporting purposes.

4. Change Procedures: Review requirements and administrative procedures for Change Orders, Construction Change Directives, Architect's supplemental instructions and Contractor's Requests for Interpretation or Information.

5. Use of premises by District and Contractor.

   a. Site access restrictions, if any, and requirements to avoid disruption of operations at adjoining facilities or operations.

   b. Construction Facilities and Temporary Utilities: Designate storage and staging areas, construction office areas; review temporary utility provisions; present District's requirements for use of premises.

6. District's requirements.

7. Construction facilities and controls provided by District.

8. Temporary utilities provided by District.

9. Survey and building layout.

10. Security and housekeeping procedures.

11. Schedules.

    a. Distribute and discuss initial construction schedule and critical work sequencing of major elements of Work;

    b. Include coordination of District Furnished / Contractor Installed (OFCI) products;

    c. Work under separate contracts by serving utility agencies;

    d. Work under separate contracts by companies and District.

12. Review requirements for Contractor's coordination of Work; review sequence and schedule for work being performed for District under separate contracts.

13. Submittals Administration: Review administrative procedures for shop drawings, product data and samples submittals and review of preliminary Submittals Schedule.

14. Materials and Equipment:

    a. Review substitution requirements;

    b. Review schedule for major equipment purchases and deliveries;

    c. Review materials and equipment to be provided by District (OFCI products).

15. Permits and Fees: Review Contract requirements and review schedule and process for obtaining permits and paying fees.

16. Application for payment procedures.
17. Procedures for testing.
    a. Review tests and inspections to be performed by the following:
        1) Independent testing and inspection agency.
        2) Manufacturers and installers.
        3) Serving utilities and public agencies.
        4) Authorities having jurisdiction.
18. Procedures for maintaining record documents.
19. Requirements for start-up of equipment.
    a. Operation and Maintenance Data:
        1) Format and content of operation and maintenance manuals; instruction of District's personnel.
20. Inspection and acceptance of equipment put into service during construction period.

D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, District, participants, and those affected by decisions made.

3.04 PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the work at maximum bi-weekly intervals.

B. Meeting Time and Location: As mutually agreed by District, Architect, and Contractor, at on-site location.

C. Special Meetings: As necessary, Owner Representative may convene special meetings to discuss specific construction issues in detail and to plan specific activities.
    1. See Section 01 70 00 - Execution and Closeout Requirements.

D. Attendance Required:
    1. Contractor.
    2. District.
    3. Architect.
    4. Construction Manager.
    5. Special consultants.
    6. Contractor's superintendent.
    7. Major subcontractors.
    8. Project Inspector of Record.

E. Agenda:
    1. Review minutes of previous meetings.
        a. Unless published minutes are challenged in writing prior to the next regularly scheduled progress meeting, they will be accepted as properly stating the activities and decisions of the meeting.

b. Persons challenging published minutes shall reproduce and distribute copies of the challenge to all indicated recipients of the particular set of minutes.

c. Challenge to minutes shall be settled as priority portions of "old business" at the next regularly scheduled meeting.

2. Review of work progress.
3. Field observations, problems, and decisions.
4. Identification of problems that impede, or will impede, planned progress.
5. Review of submittals schedule and status of submittals.
6. Review of RFIs log and status of responses.
7. Review of off-site fabrication and delivery schedules.
8. Maintenance of progress schedule.
9. Corrective measures to regain projected schedules.
    a. Develop corrective measures and procedures, including but not necessarily limited to additional personnel loading to regain planned schedule.
10. Planned progress during succeeding work period.
11. Coordination of projected progress.
12. Maintenance of quality and work standards.
13. Effect of proposed changes on progress schedule and coordination.
14. Other business relating to work.

F. Record minutes and distribute copies within two days after meeting to participants, with copies to Architect, District, participants, and those affected by decisions made.

3.05 CONSTRUCTION PROGRESS SCHEDULE

A. Within 10 days after date of the Agreement, submit preliminary schedule defining planned operations for the first 60 days of work, with a general outline for remainder of work.

B. Contractor's Review: All schedules shall be reviewed and approved by Contractor prior to submission for Architect's and District's review.

C. Reviews by Architect and District will be to ascertain the general status of construction and shall not be interpreted to establish or approve the means, methods, techniques and sequences of construction.

D. If preliminary schedule requires revision after review, submit revised schedule within 10 days.

E. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.

1. Include written certification that major contractors have reviewed and accepted proposed schedule.

F. Within 10 days after joint review, submit complete schedule.

G. Submit updated schedule with each Application for Payment.

3.06 DAILY CONSTRUCTION REPORTS

A. Include only factual information. Do not include personal remarks or opinions regarding operations and/or personnel.

B. In addition to transmitting electronically a copy to District and Architect, submit two printed copies at weekly intervals.

1. Submit in format acceptable to District.
2. Submit using required form, a sample of which is appended to this section.

C. Prepare a daily construction report recording the following information concerning events at Project site and project progress:

1. Date.
2. High and low temperatures, and general weather conditions.
3. List of subcontractors at Project site.
4. List of separate contractors at Project site.
5. Approximate count of personnel at Project site.
    a. Include a breakdown for supervisors, laborers, journeymen, equipment operators, and helpers.
6. Major equipment at Project site.
7. Material deliveries.
8. Safety, environmental, or industrial relations incidents.
9. Meetings and significant decisions.
10. Unusual events (submit a separate special report).
11. Stoppages, delays, shortages, and losses. Include comparison between scheduled work activities (in Contractor's most recently updated and published schedule) and actual activities. Explain differences, if any. Note days or periods when no work was in progress and explain the reasons why.
12. Meter readings and similar recordings.
13. Emergency procedures.
14. Directives and requests of authority having jurisdiction (AHJ).
15. Change Orders received and implemented.
16. Testing and/or inspections performed.
17. List of verbal instruction given by District and/or Architect.
18. Signature of Contractor's authorized representative.

3.07 PROGRESS PHOTOGRAPHS

A. Submit photographs with each application for payment, taken not more than 3 days prior to submission of application for payment.

B. Maintain one set of all photographs at project site for reference; same copies as submitted, identified as such.

C. Photography Type: Digital; electronic files.

D. Provide photographs of site and construction throughout progress of work produced by an experienced photographer, acceptable to Architect.

E. In addition to periodic, recurring views, take photographs of each of the following events:

1. Completion of site clearing.
2. Excavations in progress.
3. Foundations in progress and upon completion.
4. Structural framing in progress and upon completion.
5. Enclosure of building, upon completion.
6. Final completion, minimum of ten (10) photos.

F. Take photographs as evidence of existing project conditions as follows:

1. Interior views: each elevation, floor and ceilings prior to demolition.
2. Exterior views: each elevation, roof, each area of work and areas adjacent to construction limits and areas adjacent to construction limits.

G. Views:

1. Provide non-aerial photographs from four cardinal views at each specified time, until date of Final Inspection.
2. Consult with Architect for instructions on views required.
3. Provide factual presentation.
4. Provide correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion.
5. Point of View Sketch: Provide sketch identifying point of view of each photograph.

H. Digital Photographs: 24 bit color, minimum resolution of 1600 by 1200 ("2 megapixel"), in JPG format; provide files unaltered by photo editing software.

1. Delivery Medium: Via email.
2. File Naming: Include project identification, date and time of view, and view identification.
3. Point of View Sketch: Include digital copy of point of view sketch with each electronic submittal; include point of view identification in each photo file name.
4. PDF File: Assemble all photos into printable pages in PDF format, with 2 to 3 photos per page, each photo labeled with file name; one PDF file per submittal.
5. Photo CD(s): Provide 1 copy including all photos cumulative to date and PDF file(s), with files organized in separate folders by submittal date.
6. Hard Copy: Printed hardcopy (grayscale) of PDF file and point of view sketch.

I. Provide information required by Project Coordinator for preparation of coordination drawings.

3.08 REQUESTS FOR INTERPRETATION OR INFORMATION (RFI)

A. Definition: A request seeking one of the following:

1. An interpretation, amplification, or clarification of some requirement of Contract Documents arising from inability to determine from them the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of work is described differently at more than one place in the Contract Documents.
2. A resolution to an issue which has arisen due to field conditions and affects design intent.

B. Whenever possible, request clarifications at the next appropriate project progress meeting, with response entered into meeting minutes, rendering unnecessary the issuance of a formal RFI.

C. Preparation: Prepare an RFI immediately upon discovery of a need for interpretation of Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
   1. Prepare a separate RFI for each specific item.
      a. Review, coordinate, and comment on requests originating with subcontractors and/or materials suppliers.
      b. Do not forward requests which solely require internal coordination between subcontractors.
   2. Prepare in a format and with content acceptable to District.
   3. Combine RFI and its attachments into a single electronic file. PDF format is preferred.

D. Reason for the RFI: Prior to initiation of an RFI, carefully study all Contract Documents to confirm that information sufficient for their interpretation is definitely not included.
   1. Include in each request Contractor's signature attesting to good faith effort to determine from Contract Documents information requiring interpretation.
      a. Submit RFIs from subcontractors and material suppliers through, be reviewed by and be attached to an RFI prepared, signed and submitted by Contractor.
         1) RFIs from subcontractors and material suppliers are to be:
            (a) Reviewed by Contractor.
            (b) Corrected and rewritten to clarify as required by Contractor.
            (c) Placed on the proper form, then signed, and submitted by Contractor.
            (d) RFIs submitted directly by subcontractors or material suppliers will be returned unanswered to the Contractor.
         2) RFIs submitted directly by subcontractors or material suppliers will be returned unanswered to the Contractor.
      b. Review all subcontractor- and supplier-initiated RFIs and take actions to resolve issues of coordination, sequencing and layout of the Work.
         1) RFIs submitted to request clarification of issues related to means, methods, techniques and sequences of construction or for establishing trade jurisdictions and scopes of subcontracts will be returned without response.
            (a) Such issues are solely the Contractor's responsibility.

2) Contractor is responsible for delays resulting from the necessity to resubmit an RFI due to insufficient or incorrect information presented in the RFI.

2. Unacceptable Uses for RFIs: Do not use RFIs to request the following::
   a. Approval of submittals (use procedures specified elsewhere in this section).
   b. Approval of substitutions (see Section - 01 60 00 - Product Requirements)
   c. Changes that entail change in Contract Time and Contract Sum (comply with provisions of the Conditions of the Contract).
   d. Different methods of performing work than those indicated in the Contract Drawings and Specifications (comply with provisions of the Conditions of the Contract).
3. Improper RFIs: Requests not prepared in compliance with requirements of this section, and/or missing key information required to render an actionable response. They will be returned without a response, with an explanatory notation.
4. Frivolous RFIs: Requests regarding information that is clearly indicated on, or reasonably inferable from, Contract Documents, with no additional input required to clarify the question. They will be returned without a response, with an explanatory notation.
   a. The District reserves the right to assess the Contractor for the costs (on time-and-materials basis) incurred by the Architect, and any of its consultants, due to processing of such RFIs.

E. Content: Include identifiers necessary for tracking the status of each RFI, and information necessary to provide an actionable response.
1. Official Project name and number, and any additional required identifiers established in Contract Documents.
2. District's, Architect's, and Contractor's names.
3. Discrete and consecutive RFI number, and descriptive subject/title.
4. Issue date, and requested reply date.
5. Reference to particular Contract Document(s) requiring additional information/interpretation. Identify pertinent drawing and detail number and/or specification section number, title, and paragraph(s).
6. Annotations: Field dimensions and/or description of conditions which have engendered the request.
   a. Inability to determine from the Contract Documents the exact material, process, or system to be installed;
   b. Or when the elements of construction are required to occupy the same space (interference);
   c. Or when an item of Work is described differently at more than one place in the Contract Documents.

7. Contractor's suggested resolution: A written and/or a graphic solution, to scale, is required in cases where clarification of coordination issues is involved, for example; routing, clearances, and/or specific locations of work shown diagrammatically in Contract Documents. If applicable, state the likely impact of the suggested resolution on Contract Time or the Contract Sum.
    a. In all cases, furnish all information required for the Architect to analyze and/or understand the circumstances causing the RFI and prepare a clarification or direction as to proceed for RFIs issued to request clarification of issues related to:
        1) Means, methods, techniques and sequences of construction, for example
        2) Pipe and duct routing, clearances;
        3) Specific locations of Work shown diagrammatically;
        4) Apparent interferences and similar items.
        5) If information included with this type RFI by the Contractor is insufficient, the RFI will be returned unanswered.

F. Attachments: Include sketches, coordination drawings, descriptions, photos, submittals, and other information necessary to substantiate the reason for the request.

G. RFI Log: Prepare and maintain a tabular log of RFIs for the duration of the project.
    1. Indicate current status of every RFI. Update log promptly and on a regular basis.
    2. Note dates of when each request is made, and when a response is received.
    3. Highlight items requiring priority or expedited response.
    4. Highlight items for which a timely response has not been received to date.
    5. Identify and include improper or frivolous RFIs.

H. Review Time: Architect will respond and return RFIs to Contractor within seven calendar days of receipt. For the purpose of establishing the start of the mandated response period, RFIs received after 12:00 noon will be considered as having been received on the following regular working day.
    1. Response period may be shortened or lengthened for specific items, subject to mutual agreement, and recorded in a timely manner in progress meeting minutes.

I. Responses: Content of answered RFIs will not constitute in any manner a directive or authorization to perform extra work or delay the project. If in Contractor's belief it is likely to lead to a change to Contract Sum or Contract Time, promptly issue a notice to this effect, and follow up with an appropriate Change Order request to District.
    1. Response may include a request for additional information, in which case the original RFI will be deemed as having been answered, and an amended one is to be issued forthwith. Identify the amended RFI with an R suffix to the original number.
    2. Do not extend applicability of a response to specific item to encompass other similar conditions, unless specifically so noted in the response.
    3. Upon receipt of a response, promptly review and distribute it to all affected parties, and update the RFI Log.

4. Notify Architect within seven calendar days if an additional or corrected response is required by submitting an amended version of the original RFI, identified as specified above.

3.09 SUBMITTAL SCHEDULE

A. Submit to Architect for review a schedule for submittals in tabular format.

1. Submit at the same time as the preliminary schedule.
    a. Submit initial Submittals Schedule within 14 days of date of Notice of Award of construction.
    b. After review and return by Architect, resubmit Submittals Schedule within 10 days and thereafter submit updated Submittals Schedules at each Construction Progress Meeting.
    c. Submit one copy each to Owner and Architect.
2. Coordinate with Contractor's construction schedule and schedule of values.
3. Format schedule to allow tracking of status of submittals throughout duration of construction.
    a. Prepare schedules in Gantt format using software at Contractor's option, providing clear indication of sequencing and scheduling of Work, for determination of "critical path" of construction progress.
        1) Submittals shall be connected to the related construction element by a graphically indicated critical path on the same page.
        2) Present schedules using opaque reproductions on substantial paper, with sheet size a multiple of 8-1/2 by 11 inches and large enough to clearly read characters.
4. Arrange information to include scheduled date for initial submittal, specification number and title, submittal category (for review or for information), description of item of work covered, and role and name of subcontractor.
5. Account for time required for preparation, review, manufacturing, fabrication and delivery when establishing submittal delivery and review deadline dates.
    a. For assemblies, equipment, systems comprised of multiple components and/or requiring detailed coordination with other work, allow for additional time to make corrections or revisions to initial submittals, and time for their review.
    b. Allow time for shipping and distribution to involved parties. Minimum 1 day, including those sent by electronic transmission.
6. Posting: Post one copy of most recent Submittals Schedule in Contractor's field office, readily available to District, Owner Representative, and Architect. Update bi-weekly with project schedule.
7. Archive: Preserve a minimum of two copies of all superseded schedules, with one copy available at field office for review by District or Architect.

3.10 SUBMITTALS FOR REVIEW

A. When the following are specified in individual sections, submit them for review:

1. Product data.
2. Shop drawings.
3. Samples for selection.
4. Samples for verification.

B. Submit to Architect for review for the limited purpose of checking for compliance with information given and the design concept expressed in Contract Documents.

C. Samples will be reviewed for aesthetic, color, or finish selection.

D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 78 00 - Closeout Submittals.

3.11 SUBMITTALS FOR INFORMATION

A. When the following are specified in individual sections, submit them for information:
1. Design data.
2. Certificates.
3. Test reports.
4. Inspection reports.
5. Manufacturer's instructions.
6. Manufacturer's field reports.
7. Other types indicated.

B. Submit for Architect's knowledge as contract administrator or for District.

3.12 SUBMITTALS FOR PROJECT CLOSEOUT

A. Submit Correction Punch List for Final Inspection.

B. Submit Final Correction Punch List for Final Inspection.

C. When the following are specified in individual sections, submit them at project closeout in compliance with requirements of Section 01 78 00 - Closeout Submittals:
1. Project record documents.
2. Operation and maintenance data.
    a. Include operation and maintenance data submittals in Submittals Schedule specified above.
    b. Provide space for review action stamps and, if required by governing authorities having jurisdiction, license seal of design Professional, if applicable.
3. Warranties.
4. Bonds.
5. Other types as indicated.

D. Submit for District's benefit during and after project completion.

3.13 NUMBER OF COPIES OF SUBMITTALS

A. Electronic Documents: Submit one electronic copy in PDF format with renderable text; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.

B. Extra Copies at Project Closeout: See Section 01 78 00.

C. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.

1. After review, produce duplicates.
2. Retained samples will not be returned to Contractor unless specifically so stated.
3. Quantity:
    a. Submit minimum of four (4) samples of each of color, texture and pattern.
    b. Submit one item only of actual assembly or product.
    c. Unless otherwise noted, full-size and complete samples will be returned and may be incorporated into field mock-ups and the Work.

3.14 SUBMITTAL PROCEDURES

A. General Requirements:

1. Use a separate transmittal for each item.
2. Submit separate packages of submittals for review and submittals for information, when included in the same specification section.
3. Transmit using approved form.
4. Sequentially identify each item. For revised submittals use original number and a sequential numerical suffix.
5. Identify: Project; Contractor; subcontractor or supplier; pertinent drawing and detail number; and specification section number and article/paragraph, as appropriate on each copy.
    a. For example:
        1) 09 21 16-1 - First submittal for Section 09 21 16 - Gypsum Board Assemblies.
        2) 09 21 16-2 - Second submittal for Section 09 21 16 - Gypsum Board Assemblies.
    b. Use same number for resubmittals as original submittal, followed by a letter indicating sequential resubmittal. For example:
        1) 09 21 16-2A - Resubmission of second submittal for Section 09 21 16 - Gypsum Board Assemblies.
        2) 09 21 16-2B - Second resubmission of second submittal for Section 09 21 16 - Gypsum Board Assemblies.
6. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the work and Contract Documents.

a. Submittals from sources other than the Contractor, or without Contractor's stamp will not be acknowledged, reviewed, or returned.

b. Field measurements have been determined and verified.

c. Conformance with requirements of Contract Drawings and Specifications is confirmed.

d. Catalog numbers and similar data are correct.

e. Work being performed by various subcontractors and trades is coordinated.

f. Field construction criteria have been verified, including confirmation that information submitted has been coordinated with the work being performed by others for District and actual site conditions.

g. All deviations from requirements of Drawings and Specifications have been identified and noted.

7. Deliver each submittal on date noted in submittal schedule, unless an earlier date has been agreed to by all affected parties, and is of the benefit to the project.

   a. Send submittals in electronic format via email to Architect.

8. Schedule submittals to expedite the Project, and coordinate submission of related items.

   a. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.

   b. For sequential reviews involving Architect's consultants, District, or another affected party, allow an additional 7 days.

   c. For sequential reviews involving approval from authorities having jurisdiction (AHJ), in addition to Architect's approval, allow an additional 30 days.

9. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.

   a. Changes in the Work shall not be authorized by submittals review actions.

   b. No review action, implicit or explicit, shall be interpreted to authorized changes in the Work.

   c. Changes shall only be authorized by separate written Contract Change Order or Construction Change Directive, in accordance with the Conditions of the Contract and Section 01 20 00 - Price and Payment Procedures.

10. Provide space for Contractor and Architect review stamps.

11. When revised for resubmission, identify all changes made since previous submission.

12. Distribute reviewed submittals. Instruct parties to promptly report inability to comply with requirements.

13. Incomplete submittals will not be reviewed, unless they are partial submittals for distinct portion(s) of the work, and have received prior approval for their use.

14. Submittals not requested will be recognized, but will be returned without comment,

B. Product Data Procedures:

   1. Submit only information required by individual specification sections.

2. Collect required information into a single submittal.
3. Submit concurrently with related shop drawing submittal.
4. Do not submit (Material) Safety Data Sheets for materials or products.

C. Shop Drawing Procedures:
1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting Contract Documents and coordinating related work.
2. Use of reproductions of Contract Documents in digital data form to create shop drawings is only permitted as defined in Division 01 and individual product sections.
3. Coordination: Show all field dimensions and relationships to adjacent or critical features of Work.
4. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.

D. Samples Procedures:
1. Transmit related items together as single package.
2. Samples will be reviewed for aesthetic, color, or finish selection.
3. Identify each item to allow review for applicability in relation to shop drawings showing installation locations.
4. Color Selection Samples: Architect will review and select colors for Project only after all colors are received, so that colors may be properly coordinated.
5. Copies: Submit actual samples. Photographic or printed reproductions will not be accepted.
6. Review of Field Samples: Review by Architect of field samples will be made for the following example products, as applicable, if not otherwise required and if requested by Contractor.
a. Concrete wall finishes and detailing (edges, corners and reveals).
b. Concrete paving colors and textures.
c. Gypsum board textures and finishes.
d. Field-applied paint colors and finishes.

3.15 SUBMITTAL REVIEW

A. Submittals for Review: Architect will review each submittal, and approve, or take other appropriate action.

B. Submittals for Information: Architect will acknowledge receipt and review. See below for actions to be taken.

C. Architect's actions will be reflected by marking each returned submittal using virtual stamp on electronic submittals.
1. Notations may be made directly on submitted items and/or listed on appended Submittal Review cover sheet.

D. Architect's and consultants' actions on items submitted for review:

1. Authorizing purchasing, fabrication, delivery, and installation:
    a. "Approved", "Reviewed", or language with same legal meaning.
    b. "Approved as Noted, Resubmission not required", or language with same legal meaning.
        1) At Contractor's option, submit corrected item, with review notations acknowledged and incorporated.
    c. "Approved as Noted, Resubmit for Record", "Reviewed as Noted, Resubmit for Record", or language with same legal meaning.
        1) Resubmit corrected item, with review notations acknowledged and incorporated. Resubmit separately, or as part of project record documents.
        2) Non-responsive resubmittals may be rejected.
2. Not Authorizing fabrication, delivery, and installation:
    a. "Revise and Resubmit".
        1) Resubmit revised item, with review notations acknowledged and incorporated.
        2) Non-responsive resubmittals may be rejected.
    b. "Rejected".
        1) Submit item complying with requirements of Contract Documents.

E. Architect's and consultants' actions on items submitted for information:
1. Items for which no action was taken:
    a. "Received" - to notify the Contractor that the submittal has been received for record only.
2. Items for which action was taken:
    a. "Reviewed" - no further action is required from Contractor.

END OF SECTION

SECTION 01 30 00.01
REQUEST FOR INTERPRETATION (INFORMATION)

RFI NUMBER: _____ DATE: _____

PROJECT NAME: WILLIAM COLLIER ES SHADE STRUCTURE AND PLAYGROUND IMPROVEMENTS

PROJECT NO.: 24006.00

TO: TBP/ARCHITECTURE

4611 Teller Avenue, Newport Beach, CA 92660

Attention: _____

Contractor: _____

Address: _____

BRIEF SUMMARY OF RFI:

Drawing No. _____ Detail No. _____

Specification Section No. __ __ __ Title _____

Article / Paragraph _____ Page _____

DETAILS OF THIS RFI:

SUGGESTED SOLUTION:

Response required by: _____ (min. 3 full days)

Submitted By: _____ Organization: _____

RESPONSE:

Attachments:

Response By: _____ Date: _____

Organization: _____

Copies:

	File		District		Structural
	Mechanical		Plumbing		Electrical
	Fire Sprinkler		Food Service		Theater
	Civil		Landscape		other consultants

END OF RFI

SECTION 01 35 53
SECURITY PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Security measures including formal security program, entry control, personnel identification, and miscellaneous restrictions.

1.02 RELATED REQUIREMENTS

A. Section 01 10 00 - Summary: use of premises and occupancy.

B. Section 01 50 00 - Temporary Facilities and Controls: Temporary lighting.

1.03 SECURITY PROGRAM

A. Protect Work , existing premises and District's operations from theft, vandalism, and unauthorized entry.

B. Initiate program in coordination with District's existing security system at project mobilization.

C. Maintain program throughout construction period until District acceptance precludes the need for Contractor security.

1.04 ENTRY CONTROL

A. Restrict entrance of persons and vehicles into Project site and existing facilities.

B. Allow entrance only to authorized persons with proper identification.

C. Maintain log of workers and visitors, make available to District on request.

D. District will control entrance of persons and vehicles related to District's operations.

E. Contractor shall control entrance of persons and vehicles related to District's operations.

F. Coordinate access of District's personnel to site in coordination with District's security forces.

1.05 PERSONNEL IDENTIFICATION

A. Shall be worn by Contractor’s superintendent and all sub contractors

B. Provide identification badge to each person authorized to enter premises.

C. Badge To Include: Personal photograph, name, assigned number , expiration date and employer.

D. Maintain a list of accredited persons, submit copy to District on request.

E. Special badges shall be issued to construction personnel when term of construction exceeds six months.

F. Require return of badges at expiration of their employment on the Work.

1.06 RESTRICTIONS

A. Do not allow cameras on site or photographs taken except by written approval of District.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 40 00
QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Contractor Quality assurance submittals.

B. Quality assurance.

C. References and standards.

D. Inspection agencies and services.

E. Contractor's construction-related professional design services.

F. Contractor's design-related professional design services.

G. Control of installation.

H. Mock-ups.

I. Tolerances.

J. Manufacturers' field services.

K. Defect Assessment.

1.02 RELATED REQUIREMENTS

A. Section 01 30 00 - Administrative Requirements: Submittal procedures.

B. Section 01 41 00 - Regulatory Requirements: Compliance with applicable codes, ordinances and standards.

C. Section 01 45 33 - Code-Required Special Inspections and Procedures: Testing laboratory services and inspections required by Division of the State Architect (DSA), during the course of construction.

D. Section 01 60 00 - Product Requirements: Requirements for material and product quality.

1. Product options, substitutions, transportation and handling requirements, storage and protection requirements, and system completeness requirements.

1.03 REFERENCE STANDARDS

A. IAS AC89 - Accreditation Criteria for Testing Laboratories.

1.04 DEFINITIONS

A. Contractor's Quality Control Plan: Contractor's management plan for executing the Contract for Construction.

1.05 CONTRACTOR'S CONSTRUCTION-RELATED PROFESSIONAL DESIGN SERVICES

A. Coordination: Contractor's professional design services are subject to requirements of project's Conditions for Construction Contract.

B. Provide such engineering design services as may be necessary to plan and safely conduct certain construction operations, pertaining to, but not limited to the following:

1. Temporary sheeting, shoring, or supports.
2. Temporary scaffolding.
3. Temporary bracing.
4. Temporary falsework for support of spanning or arched structures.
5. Temporary stairs or steps required for construction access only.
6. Temporary hoist(s) and rigging.
7. Investigation of soil conditions to support construction equipment.

1.06 CONTRACTOR'S DESIGN-RELATED PROFESSIONAL DESIGN SERVICES

A. Coordination: Contractor's professional design services are subject to requirements of project's Conditions for Construction Contract.

B. Base design on performance and/or design criteria indicated in individual specification sections.

1. Submit a Request for Interpretation to Architect if the criteria indicated are not sufficient to perform required design services.

C. Scope of Contractor's Professional Design Services: Provide for the following items of work:

1. Structural Design of Formwork: As described in Section 03 10 00 - Concrete Forming and Accessories.
2. Concrete Mix Design: As described in Section 03 30 00 - Cast-in-Place Concrete. No specific designer qualifications are required.

1.07 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Designer's Qualification Statement: Submit for Architect's knowledge as contract administrator, or for District's information.

1. Include information for each individual professional responsible for producing, or supervising production of, design-related professional services provided by Contractor.
    a. Full name.
    b. Professional licensure information.
    c. Statement addressing extent and depth of experience specifically relevant to design of items assigned to Contractor.

C. Quality Control Submittals Schedule

1. Schedule Format: Include quality control submittals on Submittals Schedule specified in accordance with General Conditions
2. Schedule Content: List all tests, inspections and reports specified to be submitted, indicating submittal number, submittal type (field test, field inspection, fabrication inspection, etcetera), scheduled date of quality control activity and date report should be made.

D. Design Data: Submit for Architect's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for District's information.

1. Include calculations that have been used to demonstrate compliance to performance and regulatory criteria provided, and to determine design solutions.
2. Include required product data and shop drawings.
3. Include a statement or certification attesting that design data complies with criteria indicated, such as building codes, loads, functional, and similar engineering requirements.
4. Include signature and seal of design professional responsible for allocated design services on calculations and drawings.

E. Test Reports: After each test/inspection, promptly submit two copies of report to Architect, Project Inspector, and to Contractor.

1. Include:
   a. Date issued.
   b. Project title and number.
   c. Name of inspector.
   d. Date and time of sampling or inspection.
   e. Identification of product and specifications section.
   f. Location in the Project.
   g. Type of test/inspection.
   h. Date of test/inspection.
   i. Results of test/inspection.
   j. Compliance with Contract Documents.
   k. When requested by Architect, provide interpretation of results.
2. Test report submittals are for Architect's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for District's information.

F. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.

1. Indicate material or product complies with or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.

G. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the District's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

H. Manufacturer's Field Reports: Submit reports for Architect's benefit as contract administrator or for District.

1. Submit report in duplicate within 30 days of observation to Architect for information.
2. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents.

I. Erection Drawings: Submit drawings for Architect's benefit as contract administrator or for District.

1. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents.
2. Data indicating inappropriate or unacceptable Work may be subject to action by Architect or District.

1.08 QUALITY ASSURANCE

A. Testing Agency Qualifications:

1. Prior to start of work, submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.
2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
3. Qualification Statement: Provide documentation showing testing laboratory is approved by Division of the State Architect.
4. Qualification Statement: Provide documentation showing testing laboratory is accredited under IAS AC89.

B. Designer Qualifications: Where professional engineering design services and design data submittals are specifically required of Contractor by Contract Documents, provide services of a Professional Engineer experienced in design of this type of work and licensed in California.

C. Contractor's Quality Control (CQC) Plan:

1. Prior to start of work, submit a comprehensive plan describing how contract deliverables will be produced. Tailor CQC plan to specific requirements of the project. Include the following information:
    a. Management Structure: Identify personnel responsible for quality. Include a chart showing lines of authority.
        1) Include qualifications (in resume form), duties, responsibilities of each person assigned to CQC function.
    b. Management Approach: Define, describe, and include in the plan specific methodologies used in executing the work.
        1) Management and control of documents and records relating to quality.
        2) Communications.
        3) Coordination procedures.
        4) Resource management.

5) Process control.
6) Inspection and testing procedures and scheduling.
7) Control of noncomplying work.
8) Tracking deficiencies from identification, through acceptable corrective action, and verification.
9) Control of testing and measuring equipment.
10) Project materials certification.
11) Managerial continuity and flexibility.

c. District will not make a separate payment for providing and maintaining a Quality Control Plan. Include associated costs in Bid price.

d. Acceptance of the plan is required prior to start of construction activities not including mobilization work. District's acceptance of the plan will be conditional and predicated on continuing satisfactory adherence to the plan. District reserves the right to require Contractor to make changes to the plan and operations, including removal of personnel, as necessary, to obtain specified quality of work results.

D. Quality-Control Personnel Qualifications. Engage a person with requisite training and experience to implement and manage quality assurance (QA) and quality control (QC) for the project.

1.09 REFERENCES AND STANDARDS

A. For products and workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Comply with reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.

C. Obtain copies of standards where required by product specification sections.

D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Final Inspection.

E. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.

F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Architect shall be altered from Contract Documents by mention or inference otherwise in any reference document.

1.10 REGULATORY REQUIREMENTS FOR TESTING AND INSPECTION

A. Inspections, testing and approvals as required by authorities having jurisdiction. Refer to Section 01 41 00 - Regulatory Requirements and Section 01 45 33 - Code-Required Special Inspections and Procedures.

B. Standards and Code Compliance and Manufacturer's Instructions and Recommendations: Unless more stringent requirements are indicated or specified, comply with manufacturer's instructions and recommendations, reference standards and building code research report requirements in preparing, fabricating, erecting, installing, applying, connecting and finishing Work.

C. Deviations from Standards and Code Compliance and Manufacturer's Instructions and Recommendations: Document and explain all deviations from reference standards and building code research report requirements and manufacturer's product installation instructions and recommendations, including acknowledgement by the manufacturer that such deviations are acceptable and appropriate for the Project.

1.11 TESTING AND INSPECTION AGENCIES AND SERVICES

A. District will employ and pay for services of an independent testing agency approved by DSA to perform specified testing.

B. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTRACTOR'S QUALITY ASSURANCE

A. Quality Requirements: Work shall be accomplished in accordance with quality requirements of the Drawings and Specifications, including, by reference, all Codes, laws, rules, regulations and standards. When no quality basis is prescribed, the quality shall be in accordance with the best accepted practices of the construction industry for the locale of the Project, for projects of this type.

B. Quality Control Personnel: Contractor shall employ and assign knowledgeable and skilled personnel as necessary to perform quality control functions to ensure that the Work is provided as required.

3.02 CONTROL OF INSTALLATION

A. Quality of Products: Unless otherwise indicated or specified, all products shall be new, free of defects and fit for the intended use.

B. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.

C. Comply with manufacturers' instructions, including each step in sequence.

D. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.

E. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

F. Have work performed by persons qualified to produce required and specified quality.

G. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

H. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

I. Quality of Installation: All Work shall be produced plumb, level, square and true, or true to indicated angle, and with proper alignment and relationship between the various elements.

J. Protection of Existing and Completed Work: Take all measures necessary to preserve and protect existing and completed Work free from damage, deterioration, soiling and staining, until Acceptance by the District.

K. Verification of Quality: Work shall be subject to verification of quality by District, or Architect in accordance with provisions of the General Conditions of the Contract.

1. Contractor shall cooperate by making Work available for inspection by District, Architect or their designated representatives.
2. Such verification may include mill, plant, shop, or field inspection as required.
3. Provide access to all parts of the Work, including plants where materials or equipment are manufactured or fabricated.
4. Provide all information and assistance as required, including that by and from subcontractors, installers, fabricators, materials suppliers and manufacturers, for verification of quality by District, or Architect.
5. Contract modifications, if any, resulting from such verification activities shall be governed by applicable provisions in the General Conditions.

3.03 TOLERANCES

A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.

C. Adjust products to appropriate dimensions; position before securing products in place.

3.04 TESTING AND INSPECTION

A. See individual specification sections for testing required.

B. Testing Agency Duties:

1. Test samples of mixes submitted by Contractor.
2. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
3. Perform specified sampling and testing of products in accordance with specified standards.
4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
5. Promptly notify Architect and Contractor of observed irregularities or non-compliance of Work or products.
6. Perform additional tests and inspections required by Architect.

7. Submit reports of all tests/inspections specified.

C. Limits on Testing/Inspection Agency Authority:
   1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
   2. Agency may not approve or accept any portion of the Work.
   3. Agency may not assume any duties of Contractor.
   4. Agency has no authority to stop the Work.

D. Contractor Responsibilities:
   1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
   2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
   3. Provide incidental labor and facilities:
      a. To provide access to Work to be tested/inspected.
      b. To facilitate tests/inspections.
      c. To provide for storage and curing of test samples.
   4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
   5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
   6. Arrange with District's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
   7. Inspections and Tests by Authorities Having Jurisdiction:
      a. Contractor shall cause all tests and inspections to be made for Work under this Contract, as required by Building Departments, Department of Public Works, Fire Department, Health Department and similar agencies having jurisdiction.
      b. Excepted as specifically noted, scheduling, conducting and paying for such inspections shall be solely the Contractor's responsibility.
   8. Inspections and Tests by Serving Utilities:
      a. Contractor shall cause all tests and inspections required by serving utilities to be made for Work under this Contract.
      b. Scheduling, conducting and paying for such inspections shall be solely the Contractor's responsibility.

E. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Architect.

F. Costs of re-testing required because of non-compliance with specified requirements are to be reimbursed to the District by the Contractor through a deductive change order, CAC 4-335(b).

3.05 MANUFACTURERS' FIELD SERVICES

A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust, and balance equipment as applicable, and to initiate instructions when necessary.

B. Submit qualifications of observer to Architect 30 days in advance of required observations.

1. Observer subject to approval of Architect.
2. Observer subject to approval of District.

C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

3.06 FIELD QUALITY CONTROL SUBMITTALS

A. Administration: Make all submittals to the Architect, unless otherwise directed.

B. Submittal Identification: Identify each submittal by Specification Section number followed by a number indicating sequential submittal for that Section. Coordinate submittal numbers with submittals specified in Section 01 30 00 - Administrative Requirements.

1. Resubmittals shall use same number as original submittal, followed by a letter indicating sequential resubmittal. Example:

03 30 00 - 1	First submittal for Section 03 30 00 - Cast in Place Concrete.
03 30 00 - 2	Second submittal for Section 03 30 00 - Cast in Place Concrete.
03 30 00 - 2A	Resubmittal of second submittal for Section 03 30 00 - Cast in Place Concrete.
03 30 00 - 2B	Second resubmittal of second submittal for Section 03 30 00 - Cast in Place Concrete.

C. Project Identification: Title each submittal with Project name, submittal date and Architect's Project number.

D. Copies: Provide PDF copies electronically transmitted or submit 6 copies, minimum, of reports of quality control reports on dry-process xerographic copies only.

E. Contractor's Review:

1. Submittals shall be made in accordance with requirements specified herein and in individual Sections.
2. Indicate clearly on each submittal the specified or referenced values for each quality control activity and the values obtained.
3. Note clearly and sign each submittal certifying that reported quality control activity "Conforms" or "Does Not Conform".

F. Changes and Deviations:

1. Identify all deviations from requirements of Drawings and Specifications.
2. Changes in the Work shall not be authorized by submittals review actions.
3. No review action, implicit or explicit, shall be interpreted to authorized changes in the Work.

4. Changes shall only be authorized by separate written Change Order or Construction Change Directive, in accordance with the General Conditions and 01 20 00 - Price and Payment Procedures.

G. Record Submittals: When record submittals are specified, submit three copies or sets only. Record submittals will not be reviewed but will be retained for historical and maintenance purposes.

H. Unsolicited Submittals: Unsolicited submittals will be returned unreviewed.

3.07 ARCHITECT'S REVIEW

A. General:

1. Submitted Report review by Architect and Architect's consultants shall be only for general conformance with the design concept and requirements based on the information presented.

2. Neither Architect nor Architect's consultants shall verify submitted quality control data.

B. Contract Requirements:

1. Review by Architect and Architect's consultants shall not relieve the Contractor from compliance with requirements of the Drawings and Specifications.

2. Changes shall only be authorized by separate written Change Order or Construction Change Directive, in accordance with the General Conditions and 01 20 00 - Price and Payment Procedures.

C. Observations by Architect and Architect's Consultants: Periodic and occasional observations of Work in progress will be made by Architect and Architect's consultants as deemed necessary to review progress of Work and general conformance with design intent.

3.08 DEFECT ASSESSMENT

A. Replace Work or portions of the Work not conforming to specified requirements, at no change in Contract Sum or Contract Time.

B. If, in the opinion of Architect, it is not practical to remove and replace the work, Architect will direct an appropriate remedy or adjust payment.

C. Architect's Acceptance and Rejection of Work: Architect reserves the right to reject all Work not in conformance to the requirements of the Drawings and Specifications.

D. Acceptance of Non-Conforming Work: Acceptance of non-conforming Work, without specific written acknowledgement and approval of the District, shall not relieve the Contractor of the obligation to correct such Work.

1. Acceptance of structurally related non-conforming work shall be submitted to DSA for review and approval.

E. Contract Adjustment for Non-conforming Work:

1. Should Architect or District determine that it is not feasible or in District's interest to require non-conforming Work to be repaired or replaced, an equitable reduction in Contract Sum shall be made by agreement between District and Contractor.

2. If equitable amount cannot be agreed upon, a Construction Change Directive will be issued and the amount in dispute resolved in accordance with applicable provisions of the General Conditions.

F. Non-Responsibility for Non-Conforming Work: Architect and Architect's consultants disclaim any and all responsibility for Work produced not in conformance with the Drawings and Specifications.

END OF SECTION

SECTION 01 41 00
REGULATORY REQUIREMENTS

PART 1 GENERAL

1.01 AUTHORITY AND PRECEDENCE OF CODES, ORDINANCES AND STANDARDS

A. Authority: All codes, ordinances and standards referenced in the Drawings and Specifications shall have the full force and effect as though printed in their entirety in the Specifications.

B. Precedence:

1. Where specified requirements differ from the requirements of applicable codes, ordinances and standards, the more stringent requirements take precedence.
2. Where the Drawings or Specifications require or describe products or execution of better quality, higher standard or greater size than required by applicable codes, ordinances and standards, the Drawings and Specifications take precedence so long as such increase is legal.
3. Where no requirements are identified in the Drawings or Specifications, comply with all requirements of applicable codes, ordinances and standards of authorities having jurisdiction.

C. Applicable Codes, Laws and Ordinances: Refer also to Section 01 10 00 - Summary, regarding permits and licenses.

1. Performance of the Work is be governed by all applicable laws, ordinances, rules and regulations of Federal, State and local governmental agencies and jurisdictions having authority over the Project, including accessibility requirements.
2. Performance of the Work shall be accomplished in conformance with all rules and regulations of public utilities, utility districts and other agencies serving the development.
3. Where such laws, ordinances, rules and regulations require more care or greater time to accomplish Work, or require better quality, higher standards or greater size of products, Work shall be accomplished in conformance to such requirements with no change to the Contract Time and Contract Sum, except where changes in laws, ordinances, rules and regulations occur subsequent to the execution date of the Agreement.

D. Applicable Building Codes: References on the Drawings or in the Specifications to "code" or "building code" not otherwise identified shall mean the codes specified below, together with all additions, amendments, changes, and interpretations adopted by code authorities of the jurisdiction having authority over the Project.

E. Performance of the Work shall meet or exceed the minimum regulatory requirements applicable to this project are summarized in this section, as adopted by Division of the State Architect:

1. Part 1, Title 24 CCR - 2025 California Administrative Code.
2. Part 2, Title 24 CCR - 2025 California Building Code (CBC); Volumes 1 and 2.
    a. Effective dates of referenced standards are according to Chapter 35.

3. Part 3, Title 24 CCR - 2025 California Electrical Code.
4. Part 4, Title 24 CCR - 2025 California Mechanical Code (CMC).
5. Part 5, Title 24 CCR - 2025 California Plumbing Code (CPC).
6. Part 6, Title 24 CCR - 2025 California Energy Code.
7. Part 9, Title 24 CCR - 2025 California Fire Code (CFC).
8. Part 10, Title 24 CCR - 2025 California Existing Buildings Code.
9. Part 11, Title 24 CCR - 2025 California Green Building Standards Code (CalGreen).
    a. California Green Building Standards Code, Title 24, Part 11 (CALGreen) Section 5.409 Life Cycle Assessment.
        1) GWP Analysis report and Worksheet WS-4.
        2) Table 5.409.3 Product GWP Limits
10. Part 12, Title 24 CCR - 2025 California Referenced Standards Code.
11. Title 19 CCR, Public Safety

F. Maintain on site during construction, a copy of California Codes and Regulations; Title 24, California Building Code, Parts 1 through 5.

1.02 SUMMARY OF REFERENCE STANDARDS

A. Regulatory requirements applicable to this project are the following:
    1. For a list of applicable standards, including California amendments to the NFPA Standards, refer to CBC Chapter 35 and CFC Chapter 80.

B. California Referenced Standards Code: Chapter 12-7-4 Fire Resistive Standards, for fire rated doors.

C. National Fire Protection Association (NFPA): (Partial List of Applicable Standards)
    1. Reference CBC for applicable NFPA Standards - 2025 CBC (SFM) Chapter 35.
    2. NFPA 13 - Standard for the Installation of Sprinkler Systems (CA Amended); 2025, as amended in 2025 CBC Ch. 35 Referenced Standards.
    3. NFPA 17A - Standard for Wet Chemical Extinguishing Systems; 2024, as indicated in 2025 CBC Ch. 35 Referenced Standards.
    4. NFPA 24 - Standard for the Installation of Private Fire Service Mains and Their Appurtenances; 2025, as amended in 2025 CBC Ch. 35 Referenced Standards.
    5. NFPA 72 - National Fire Alarm and Signaling Code (CA Amended); 2025, as amended in 2025 CBC Ch.35 Referenced Standards.
    6. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2022 as indicated in 2025 CBC Ch. 35 Referenced Standards.
    7. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2022.

D. 28 CFR 35 - Nondiscrimination on the Basis of Disability in State and Local Government Services; Final Rule; Department of Justice.

E. 28 CFR 36 - Nondiscrimination by Public Accommodations and in Commercial Facilities; Final Rule; Department of Justice.

F. 29 CFR 1910 - Occupational Safety and Health Standards.

G. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines.

H. ADA Standards - 2010 ADA Standards for Accessible Design.

1.03 RELATED REQUIREMENTS

A. Section 01 40 00 - Quality Requirements.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 45 33
CODE-REQUIRED SPECIAL INSPECTIONS AND PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Division of the State Architect (DSA) Procedures for construction oversight and inspections required during the course of construction.

B. Code-required special inspections.

1. Division of the State Architect (DSA) approved testing laboratory services and inspections required during the course of construction.

C. Testing services incidental to special inspections.

D. Submittals.

E. Fabricators' field services.

1.02 DEFINITIONS

A. Code or Building Code: California Building Code and, more specifically, Chapter 17A - Structural Tests and Special Inspections, of same.

B. Authority Having Jurisdiction (AHJ): Agency or individual officially empowered to enforce the building, fire and life safety code requirements of the permitting jurisdiction in which the Project is located.

C. NIST: National Institute of Standards and Technology.

D. Special Inspections and Tests: Inspections and testing of materials, installation, fabrication, erection, or placement of components and connections mandated by Building Code to safeguard public welfare.

1. Special inspections and tests are separate from and independent of tests and inspections conducted by District or Contractor for purposes of quality assurance and contract administration.

1.03 REFERENCE STANDARDS

A. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.

B. DSA IR 17-12 - Special Inspection Reporting Requirements.

C. DSA PR 13-01 - Construction Oversight Process.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Special Inspection Agency Qualifications: Prior to start of work, Special Inspection Agency is required to:

1. Submit agency name, address, and telephone number, names of full time registered Engineer and responsible officer.
2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
3. Submit certification that Special Inspection Agency is acceptable to AHJ.

C. Testing Agency Qualifications: Prior to start of work, Testing Agency is required to:
1. Testing and inspections will be performed by an independent testing laboratory selected and employed by the District and approved by the Division of the State Architect (DSA).
a. Qualification of a testing agency or laboratory will be under the jurisdiction of the DSA Structural Safety Section (SSS). Procedural and acceptance criteria are set forth in the California Administrative Code (CAC) Chapter 4.

D. Manufacturer's Qualification Statement: When required by AHJ, submit documentation of manufacturing capability and quality control procedures. Include documentation of AHJ approval.

E. Fabricator's Qualification Statement: When required by AHJ, submit documentation of fabrication facilities and methods and quality control procedures. Include documentation of AHJ approval.

F. Comply with DSA IR 17-12.
1. DSA Form 291: From the engineering manager of the laboratory of record.

G. Special Inspection Reports: After each special inspection, Special Inspector is required to submit at least two copies of report; Two to Architect; one each to Structural Engineer, Division of the State Architect, Project Inspector for District, District, and Contractor
1. Include:
a. File Number and Application Number assigned to this project by the DSA.
b. Date issued.
c. Project title and number.
d. Name of Special Inspector.
e. Date and time of special inspection.
f. Identification of product and specifications section.
g. Location in the Project.
h. Type of special inspection.
i. Date of special inspection.
j. Results of special inspection.
k. Compliance with contract documents.
2. Final Special Inspection Report: Document special inspections and correction of discrepancies prior to the start of the work.

H. Fabricator Special Inspection Reports: After each special inspection of fabricated items at fabricator's facility, Special Inspector is required to submit report to Architect, Structural Engineer, Division of the State Architect, Project Inspector for District, District, and Contractor

1. Include:
    a. Date issued.
    b. Project title and number.
    c. Name of Special Inspector.
    d. Date and time of special inspection.
    e. Identification of fabricated item and specification section.
    f. Location in the Project.
    g. Results of special inspection.
    h. Verification of fabrication and quality control procedures.
    i. Compliance with contract documents.
    j. Compliance with referenced standards.

I. Test Reports: After each test or inspection, Testing Agency is required to submit report to Architect, Structural Engineer, Division of the State Architect, Project Inspector for District, District, and Contractor

1. Test Reports: Signed by a Civil Engineer licensed in the State of California.
2. Include:
    a. Date issued.
    b. Project title and number.
    c. Name of inspector.
    d. Date and time of sampling or inspection.
    e. Identification of product and specifications section.
    f. Location in the Project.
    g. Type of test or inspection.
    h. Date of test or inspection.
    i. Results of test or inspection.
    j. Compliance with contract documents.
    k. Include all tests made, regardless of whether such tests indicate that the material is satisfactory or unsatisfactory.
        1) Report samples taken but not tested.
        2) Report of special sampling operations as required.
        3) Show that the material or materials were sampled and tested in accordance with the requirements of the CBC, and with the approved specifications.
        4) Definitely state whether or not the material or materials tested comply with requirements.

5) Issue test reports within 14 days of finding being known, to all parties listed above.

J. Certificates: When required by AHJ, Special Inspector will submit certification by manufacturer, fabricator, and installation subcontractor to Architect, Structural Engineer, Division of the State Architect, Project Inspector for District, District, and Contractor.

1. Indicate material or product complies with or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect and AHJ.
3. At the completion of the project, Testing Laboratory to certify in writing and on all required DSA forms, that all work specified or required to be tested and inspected conforms to drawings, specifications and applicable building codes.

K. Fabricator's Inspection Reports: When required by AHJ, submit reports to Architect and AHJ.

1. Submit report in duplicate within 30 days of observation to Architect for information.

L. Verification of Test Reports:

1. Testing Laboratory of record to submit to the Division of the State Architect (DSA) a verified report covering all tests which are required to be made by that agency during the progress of the project.
   a. Such report shall be furnished each time that work on the project is suspended, covering the tests up to that time, and at the completion of the project.
   b. Specific testing requirements as listed on the Structural Test and Inspections (T&I) Form DSA-103 for this project. These tests *may* include the following forms:
      1) DSA-201: Soils Compaction.
      2) DSA-202: Sieve Analysis.
      3) DSA-203: Tension/Bend.
      4) DSA-204: Compression.
      5) DSA-250: Special Inspection(s).
      6) DSA-291: Laboratory Verified Report.
      7) DSA-292: Special Inspection(s) Verified Report(s).
      8) DSA-293: Geotechnical Verified Report.
   c. Other Division of the State Architect (DSA) Certification Documents (Reports) as may be required.
2. DSA Form 292 - Special Inspection Verified Report shall be from all special inspectors contracting directly and individually with the school board.

1.05 SPECIAL INSPECTION AND TESTING AGENCY

A. District is to employ services of Special Inspection Agency to perform inspections and associated testing and sampling in accordance with ASTM E329 and required by building code.

B. Special Inspection Agency may delegate to independent testing agency to perform testing and sampling associated with special inspections and required by building code.

C. Employment of agency in no way relieves Contractor of obligation to perform work in accordance with requirements of contract documents.

1.06 TESTING AND INSPECTION AGENCIES

A. District is to employ services of an independent inspection and testing agency to perform observation, testing and sampling associated with special inspections including those not required by the CBC and CAC

1. Project Inspector and testing lab are employed by the District and approved by:
    a. A/E of Record.
    b. Structural Engineer (when applicable).
    c. DSA.

B. District Project Inspector:

1. A Project Inspector (IOR) employed by the District and approved by Architect, Structural Engineer and DSA in accordance with the requirements of the California Building Code will be assigned to the work.
    a. Project Inspector duties are specifically defined in Title 24 CCR Part 1, California Administrative Code Section 4-342.
2. The District's Inspector must at all times have access for the purpose of inspection to all parts of the work and to the shops where the work is in preparation, and the Contractor is required to at all times maintain proper facilities and provide safe access for such inspection.
3. The work of construction in all stages of progress shall be subject to the personal continuous observation of the District's Inspector.
    a. The Contractor is required to furnish the Project Inspector reasonable facilities for obtaining such information as may be necessary to keep him fully informed respecting the progress and manner of the work and the character of the materials.
    b. Inspection of the work does not relieve the Contractor from any obligation to fulfill the Contract.
    c. If determined by DSA, Project Inspector is required to work a normal 40 hour week on this project only. Any overtime required will be included in a deductive change order to the Contractor and sub-contractor requiring the inspection.

C. Employment of agency in no way relieves Contractor of obligation to perform work in accordance with requirements of contract documents.

D. Payments:

1. Costs of initial testing and inspection, except as specifically modified herein, or specified otherwise in technical sections, will be paid for by the District, providing such testing and inspection indicates compliance with Contract Documents. Initial tests and inspections are defined as the first tests and inspections as herein specified.
2. Testing Laboratory: Furnish to District a cost estimate breakdown covering initial tests and inspections required by Contract Documents. Estimate shall include number of tests, man-hours required for tests, field and plant inspections, travel time, and costs.

3. In the event a test or inspection indicates failure of a material or procedure to meet requirements of Contract Documents, costs for retesting and reinspection will be paid by the District and backcharged to the Contractor.
4. Additional tests and inspections not herein specified but requested by District or Architect, will be paid for by District, unless results of such tests and inspections are found to be not in compliance with Contract Documents, in which case the District will pay all costs for initial testing as well as retesting and reinspection and backcharge the Contractor.
    a. Costs for tests or inspections which are required to correct deficiencies will be paid by the District and backcharged to the Contractor.
    b. Costs for additional tests or inspections required because of change in materials being provided or change of source or supply will be paid by District and backcharged to the Contractor.
    c. Cost of testing which is required solely for the convenience of Contractor in his scheduling and performance of work will be paid by the District and backcharged to the Contractor.
    d. Overtime costs for testing and inspections performed outside the regular work day hours, including weekends and holidays, will be paid for by the District and backcharged to the Contractor. Such costs include overtime costs for the District's Inspector.
5. Testing Laboratory: Separate and identify on the invoices, the costs covering all testing and inspections which are to be backcharged to the Contractor as specified above.

1.07 QUALITY ASSURANCE

A. Testing Agency must possess DSA LEA Program acceptance.

B. Special Inspection Agency Qualifications:
    1. Independent firm specializing in performing testing and inspections of the type specified in this section.

C. Testing Agency Qualifications:
    1. Independent firm specializing in performing testing and inspections of the type specified in this section.

D. Testing and inspection services which are performed are to be in accordance with requirements of the CBC, and as specified herein. Testing and inspection services are required to verify that work meets the requirements of the Construction Documents.

E. In general, tests and inspections for structural materials are to include all items enumerated on the Structural Tests and Inspections list for this project as prepared and distributed by the Architect.

F. Copies of Documents at Project Site: Maintain at the project site a copy of each referenced document. Online copies are acceptable.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 SPECIAL INSPECTIONS AND TESTING

A. The Code requires special inspections and testing of certain materials, components, assemblies, and connections used in constructing the project. Special inspections and testing will be performed in accordance with the Code.

B. Tests and inspections are required in accordance with DSA 103 Form.

C. Special inspections and testing will be performed in accordance with the Code for the following materials and project components:

1. Concrete.
2. Wood.
3. Soils.
4. Seismic resistance.
5. Wind resistance.

3.02 SPECIAL INSPECTION AGENCY DUTIES AND RESPONSIBILITIES

A. Special Inspection Agency shall:

1. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
2. Perform specified sampling and testing of products in accordance with specified reference standards.
3. Ascertain compliance of materials and products with requirements of Contract Documents.
4. Promptly notify Architect, Structural Engineer, Division of the State Architect, Project Inspector for District, District, and Contractor of observed irregularities or non-compliance of work or products.
5. Perform additional tests and inspections required by Architect.
6. Attend preconstruction meetings and progress meetings.
7. Submit reports of all tests or inspections specified.
8. Complete required DSA Forms.

B. Limits on Special Inspection Agency Authority:

1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
2. Agency may not approve or accept any portion of the work.
3. Agency may not assume any duties of Contractor.
4. Agency has no authority to stop the work.

C. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Architect.

D. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor. CAC 4-335 (b).

3.03 TESTING AGENCY DUTIES AND RESPONSIBILITIES

A. Testing Agency Duties:

1. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
2. Perform specified sampling and testing of products in accordance with specified standards.
3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
4. Promptly notify Architect and Contractor of observed irregularities or non-compliance of work or products.
5. Perform additional tests and inspections required by Architect.
6. Attend preconstruction meetings and progress meetings.
7. Submit reports of all tests or inspections specified.
8. Complete required DSA Forms.

B. Limits on Testing or Inspection Agency Authority:

1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
2. Agency may not approve or accept any portion of the work.
3. Agency may not assume any duties of Contractor.
4. Agency has no authority to stop the work.

C. On instructions by Architect, perform re-testing required because of non-compliance with specified requirements, using the same agency.

D. Contractor will pay for re-testing required because of non-compliance with specified requirements.

E. At the completion of the project, Testing Laboratory shall certify in writing and on all required DSA forms, that all work specified or required to be tested and inspected conforms to drawings, specifications and applicable building codes.

1. See Division of the State Architect Procedure DSA PR 13-01.

3.04 CONTRACTOR DUTIES AND RESPONSIBILITIES

A. Each Multi-Prime Contractor or Subcontractor is required to comply with DSA Construction Oversight Procedure DSA PR 13-01. California Code of Regulations (CCR), Title 24, Part 1, CCR, Chapter 4, Article 1 (Sections 4-211 through 4-220) and Group1, Articles 5 and 6 (Sections 4-331 through 4-344) which provide regulations governing the construction process for projects under the jurisdiction of the Division of the State Architect (DSA).

B. Contractor Responsibilities, General:

1. Cooperate with agency and laboratory personnel; provide access to approved documents at project site, to the work, to manufacturers' facilities, and to fabricators' facilities.

2. Provide incidental labor and facilities:
    a. To provide access to work to be tested or inspected.
    b. To obtain and handle samples at the site or at source of Products to be tested or inspected.
    c. To facilitate tests or inspections.
    d. To provide storage and curing of test samples.
3. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing or inspection services.
4. Arrange with District's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
5. Retain special inspection records.

C. Submit a written "Statement of Responsibility" to comply with CBC section 1704A.4.
1. 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 are required to submit a written statement of responsibility to the Division of the State Architect and the District prior to the commencement of work on the system or component. The "Statement of Responsibility" contains the following:
    a. Acknowledgment of awareness of the special requirements contained in the statement of special inspections;
    b. Acknowledgment that control will be exercised to obtain conformance with the construction documents approved by the building official;
    c. Procedures for exercising control within the contractor’s organization, the method and frequency of reporting and the distribution of the reports; and
    d. Identification and qualifications of the person(s) exercising such control and their position(s) in the organization.

D. Contractor Responsibilities, Seismic Force-Resisting System, Designated Seismic System, and Seismic Force-Resisting Component: Submit written statement of responsibility for each item listed in the Statement of Special Inspections to AHJ and District prior to starting work. Statement of responsibility shall acknowledge awareness of special construction requirements and other requirements listed.

E. Contractor Responsibilities, Wind Force-Resisting System and Wind Force-Resisting Component: Submit written statement of responsibility for each item listed in the Statement of Special Inspections to AHJ and District prior to starting work. Statement of responsibility shall acknowledge awareness of special construction requirements and other requirements listed.

3.05 FABRICATORS' FIELD SERVICES

A. When required by AHJ or specified in individual specification sections, require fabricators to provide qualified staff personnel to observe site conditions, installation conditions, quality of workmanship, and start-up of equiment and systems and to initiate instructions when necessary.

B. Submit qualifications of observer to Architect 30 days in advance of required observations.
   1. Observer subject to approval of Architect.
   2. Observer subject to approval of District.

C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

END OF SECTION

SECTION 01 50 00
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Temporary telecommunications services.

B. Temporary sanitary facilities.

C. Temporary Controls: Barriers, enclosures, and fencing.

D. Security requirements.

E. Waste removal facilities and services.

F. Project identification sign.

1.02 RELATED REQUIREMENTS

A. Section 01 35 53 - Security Procedures

1.03 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design.

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

C. CBC - California Building Code.

1.04 REGULATORY REQUIREMENTS

A. Construction Support Facilities: Comply wiht CBC Section 11B-201.4 and ADA Standards

1. "11B-201.4 Construction Support Facilities

a. These requirements shall apply to temporary or permanent construction support facilities for uses and activities not directly associated with the actual processes of construction, including but not limited to offices, meeting rooms, plan rooms, other administrative or support functions.

b. When provided, toilet and bathing facilities serving construction support facilities shall comply with Section 11B-213. When toilet and bathing facilities serving construction support facilities are provided by portable units, at least one of each type shall be accessible and connected to the construction support facilities it serves by an accessible route.

c. *Exception*: During construction an accessible route shall not be required between site arrival points or the boundary of the area of construction and the entrance to the construction support facilities if the only means of access between them is a vehicular way not providing pedestrian access."

1.05 TEMPORARY UTILITIES

A. Provide and pay for all electrical power, lighting, water, heating and cooling, and ventilation required for construction purposes.

B. Use trigger-operated nozzles for water hoses, to avoid waste of water.

1.06 TELECOMMUNICATIONS SERVICES

A. Provide, maintain, and pay for telecommunications services to field office at time of project mobilization and duration of the project.

B. Telecommunications services shall include:

1. Windows-based personal computer dedicated to project telecommunications, with necessary software and laser printer.
    a. Provide color copier with scanning capabilities and 8.5 x 11 and 11x17 format; including copier paper for both formats.
2. Telephone Land Lines: Multiple lines, minimum; one handset per line.
3. Internet Connections: Minimum of one for each desk; Cable modem (2GB) or faster.
    a. Provide hi-speed INTERNET service in the District Construction Manager and Inspector field office for FOUR personnel; including copier/scanner.
4. Facsimile Service: Minimum of one dedicated fax machine/printer, with dedicated phone line.

1.07 TEMPORARY SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.

1. Provide temporary toilet facilities if maximum number of personnel on project is greater than 10.
2. Submit proposed location of temporary toilet(s) to Owner Representative for approval.
    a. Place on-site portable toilets away from building air intakes and entryway.

B. Maintain daily in clean and sanitary condition.

1.08 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.

C. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.09 FENCING

A. Construction: Commercial grade chain link fence. Include windscreen with galvanized steel schedule 40 post and top rail.

B. Provide 6 foot high fence around construction site; equip with vehicular and pedestrian gates with locks.

1.10 EXTERIOR ENCLOSURES

A. Provide temporary weather tight closure of exterior openings to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.

1.11 INTERIOR ENCLOSURES

A. Provide temporary partitions and ceilings as indicated to separate work areas from District-occupied areas, to prevent penetration of dust and moisture into District-occupied areas, and to prevent damage to existing materials and equipment.

B. Construction: Framing and reinforced polyethylene sheet materials with closed joints and sealed edges at intersections with existing surfaces:

1. Maximum flame spread rating of 75 in accordance with ASTM E84.

C. Paint surfaces exposed to view from District-occupied areas.

1.12 SECURITY

A. Provide security and facilities to protect Work, existing facilities, and District's operations from unauthorized entry, vandalism, or theft.

B. Coordinate with District's security program.

1. Include construction surveillance camera system per the District.

1.13 CAFETERIA AND FOOD

A. Construction personnel shall police their own areas. All cups, cans, paper, wrappers, and discarded food must be placed in trash receptacles at end of each break.

B. Contractor(s) shall submit to Owner Representative proposed location of any break areas and eating areas for approval.

1.14 SMOKING AND TOBACCO

A. Smoking and vaping is not permitted on property.

B. No chewing tobacco or spitting of tobacco is permitted.

1.15 VEHICULAR ACCESS AND PARKING

A. Comply with regulations relating to use of streets and sidewalks, access to emergency facilities, and access for emergency vehicles.

B. Coordinate access and haul routes with governing authorities and District.

C. Provide and maintain access to fire hydrants, free of obstructions.

D. Provide means of removing mud from vehicle wheels before entering streets.

E. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.

1.16 WASTE REMOVAL

A. See Section 01 74 19 - Construction Waste Management and Disposal, for additional requirements.

B. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.

C. Provide containers with lids. Remove trash from site periodically.

D. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.

E. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.17 PROJECT IDENTIFICATION

A. Provide project identification sign of design and construction indicated on drawings.

B. Erect on site at location indicated.

C. No other signs are allowed without District permission except those required by law.

1.18 FIELD OFFICES

A. Office: Weathertight, with lighting, electrical outlets, heating, cooling equipment, and equipped with sturdy furniture, drawing rack, and drawing display table.

B. Provide space for Project meetings, with table and chairs to accommodate 6 persons.

C. Provide separate private office similarly equipped and furnished, for use of District.

D. Locate offices a minimum distance of 30 feet from existing and new structures.

1.19 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary utilities, equipment, facilities, materials, prior to Final Application for Payment inspection.

B. Remove underground installations to a minimum depth of 2 feet. Grade site as indicated.

C. Clean and repair damage caused by installation or use of temporary work.

D. Restore existing facilities used during construction to original condition.

E. Restore new permanent facilities used during construction to specified condition.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 57 23

TEMPORARY STORM WATER POLLUTION CONTROL

PART 1 - GENERAL

1.1 The Contractor shall exercise every reasonable precaution to protect channels, storm drains, and bodies of water from pollution.

A. Conduct and schedule operations to minimize or avoid muddying and silting channels, drains, and waters.

B. As required, obtain permits for erosion and water pollution control from the appropriate jurisdictional agency before starting Work.

C. Provide any necessary water pollution control devices to prevent, control, and abate water pollution, and implement good housekeeping pollution control measures to reduce the discharge of pollutants from work sites to the maximum extent practicable. These water pollution control devices include drains, gutters, slope protection blankets and retention basins and shall be constructed concurrently with other Work at the earliest practicable time.

D. Exercise care in preserving vegetation and protecting property, to avoid disturbing areas beyond the limits of the Work. Promptly repair any damage caused by Contractor operations.

E. Comply with the specific requirements based on acreage of disturbed soil.

F. Penalties: Failure to comply with this Section may result in significant fines and possible imprisonment. The RWQCB or other prosecuting authority may assess fines of up to $32,500 per day for each violation. Should the Owner be fined or penalized as a result of the Contractor failing to comply with this Section, the Contractor shall reimburse the Owner for any and all fines, penalties and related costs.

G. Notification and Report: If pollution occurs in the work area for any reason or when the Contractor becomes aware of any violation of this Section, correct the problem and immediately notify the Inspector. In addition, submit a written report to the Engineer within seven (7) calendar days describing the incident and the corrective actions taken. If either the Inspector or Engineer is first to observe pollution or a violation, the Contractor shall also explain in the written report why the Work was inadequately monitored.

H. The provisions of this Section describe minimum compliance and do not preclude other more stringent stormwater pollution control measures that may be required in the Contract.

1.2 DEFINITIONS

A. “Construction activity": Operations such as clearing, grading, disturbances to the ground such as stockpiling, or excavation that results in soil disturbances. If construction activity is part of a larger common plan of development, the amount of disturbed soil is the total land area of disturbed soil that results under the common plan.

1.3 LIABILITIES & PENALTIES:

A. Payment of penalties for non-compliance by CONTRACTOR shall be the sole responsibility of CONTRACTOR.

B. Compliance with the Clean Water Act pertaining is the sole responsibility of CONTRACTOR. Any fine against OWNER due to non-compliance by CONTRACTOR, OWNER shall recover all costs of the fine by appropriate OWNER Assessment.

PART 2 - EXECUTION

2.1 Construction activity: Comply with the following minimum water quality protection requirements.

A. Retain eroded sediments and other pollutants on-site and do not allow transportation from the site by sheet flow, swales, area drains, natural drainage, or wind. Control slope and channel erosion by implementing an effective combination of best management practices (BMPs). Such BMPs include scheduling grading during non-rainy seasons, planting and maintaining vegetation on slopes and covering erosion-susceptible slopes.

B. Protect stockpiles of earth and other construction-related materials from being transported from the site by wind or water.

C. Properly store and handle fuels, oils, solvents, and other toxic materials to not contaminate the soil or surface waters, enter the groundwater, or be placed where they may enter a live stream, channel, drain, or other water conveyance facility. Protect all approved toxic storage containers from weather. Clean spills immediately and properly dispose of cleanup materials. Spills shall not be washed into live streams, channels, drains, or other water conveyance facilities. IF RAIN OR STORM WATER RUN OFF COMES IN CONTACT WITH POLLUTANTS (SUCH AS SOIL STABILIZERS, PAINT OR FLUID FROM VEHICLES) REPORT TO INSPECTOR IMMEDIATELY. CONTRACTOR WILL BE REQUIRED TO SAMPLE AND REMEDIATE CONTAMINATED WATER.

D. Do not wash excess or waste concrete into the public way or any drainage system. Retain concrete wastes on-site until they can be appropriately disposed of or recycled.

E. Deposit trash and construction-related solid wastes in covered receptacles to prevent contamination of rainwater and dispersal by wind.

F. Do not allow sediments and other materials to be tracked from the site by vehicle traffic. Stabilize construction entrance roadways to inhibit sediments from being deposited onto public ways. Immediately sweep up accidental depositions. Do not allow depositions to be washed away by rain or by any other means.

G. Contain non-stormwater runoff from equipment or vehicle washing and any other activity at the work site.

H. At completion of the Work, clear the worksite of debris and restore to a condition at least equal to or better than prior to construction.

PART 3 – MAINTENANCE

3.1 To ensure the proper implementation and functioning of control measures, the Contractor shall regularly inspect and maintain the construction site. The Contractor shall identify corrective actions and time needed to address any deficient measures or reinitiate any measures that have been discontinued. Inspections of the construction site shall be conducted by the Contractor to identify deficient measures, as follows:

1. Prior to a forecast storm;
2. At 24-hour intervals during extended precipitation events;
3. After all precipitation, which causes runoff capable of carrying sediment from the construction site; and;
4. Routinely, at a minimum of once every week during the rainy season (October 1st – April 30th) and once every month during non-rainy season (May 1st – September 30th).

3.2 All temporary and/or permanent post-construction control measures shall be maintained and regularly inspected by the Contractor after all improvements are in place and accepted by the Owner. Temporary and/or permanent post-construction landscaping maintenance shall include but not limited to, watering, seeding, hydro-seeding, matting, slope stabilization, re-vegetation, and any other maintenance control measures recommended by the Owner to insure proper erosion control and plant growth.

END OF SECTION

SECTION 01 60 00
PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General product requirements.
   1. System Completeness.
   2. Installation of Products.
B. Re-use of existing products.
C. Transportation, handling, storage and protection.
D. Product option requirements.
E. Substitution limitations.
F. Procedures for District-supplied products.
G. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 RELATED REQUIREMENTS

A. Section 01 10 00 - Summary: Identification of District-supplied products.
B. Section 01 25 00 - Substitution Procedures: Substitutions made during procurement and/or construction phases.
C. Section 01 40 00 - Quality Requirements: Product quality monitoring.
D. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions: Requirements for VOC-restricted product categories.
E. Section 01 74 19 - Construction Waste Management and Disposal: Waste disposal requirements potentially affecting product selection, packaging and substitutions.
F. Technical Specifications Sections.

1.03 REFERENCE STANDARDS

A. ASTM D6866 - Standard Test Methods for Determining the Biobased Content of Solid, Liquid, and Gaseous Samples Using Radiocarbon Analysis.
B. CAL (CDPH SM) - Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers Version 1.2.

1.04 SUBMITTALS

A. Proposed Products List: Submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
   1. Submit within 30 calendar days after date of Agreement.
   2. For products specified only by reference standards, list applicable reference standards.

B. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

C. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

D. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.

1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

E. Sustainable Design Submittals: Items necessary to document use of sustainable construction materials, products, and practices.

1.05 QUALITY ASSURANCE

1. Determine percentage of bio-based content in accordance with ASTM D6866.
2. Bio-based content must be sourced from a Sustainable Agriculture Network certified farm.

B. CAL (CDPH SM) v1.1: California Department of Public Health (CDPH) Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers, v. 1.1–2010, for the emissions testing and requirements of products and materials.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Drawings and Specifications:

1. If a conflict exists between the Drawings and the Specifications (Project Manual), then the Contractor is to submit a Request for Interpretation from the Architect.
    a. As noted in the General Conditions, the more stringent requirements govern, including cost of materials and/or installation.
2. If a specific product is indicated on the Drawings for use, then that product is to be used without exception in the location identified.
3. If the Contractor proposes the use of another "or Equal" product other than the item indicated, whether or not listed in these specifications, Contractor must submit the product using the complete substitution process**, prior to bid**. See the the Article titled "SUBSTITUTIONS".
4. DSA (Division of the State Architect) approval is also required prior to the use or installation of any substitution, on any product or location of product (requiring a revision to the Drawings or Specifications), included in these construction documents.
    a. Installation of a non-approved product may result in the Contractor removing and replacing the non-approved product at the Contractor's own expense.

B. General: Items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock, and include materials, equipment, assemblies, fabrications and systems.

1. Named Products: Items identified by manufacturer's product name, including make or model designations indicated in the manufacturer's published product data.
2. Materials: Products that are shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed or installed to form a part of the Work.
3. Equipment: A product with operating parts, whether motorized or manually operated, that requires connections such as wiring or piping.

C. Specific Product Requirements: Refer to requirements of Section 01 40 00 - Quality Requirements and individual product technical Sections for specific requirements for products.

D. Minimum Requirements: Specified requirements for products are minimum requirements. Refer to general requirements for quality of the Work specified in Section 01 40 00 - Quality Requirements and elsewhere herein.

E. Standard Products:

1. Where specific products are not specified, provide standard products of types and kinds that are suitable for the intended purposes and that are usually and customarily used on similar projects under similar conditions.
2. Products shall be as selected by Contractor and subject to review and acceptance by the District and Architect.

F. Product Completeness:

1. Provide products complete with all accessories, trim, finish, safety guards and other devices and details needed for a complete installation and for the intended use and effect.
2. Comply with additional requirements specified herein in Article titled "SYSTEM COMPLETENESS".

G. Code Compliance:

1. All products, other than commodity products prescribed by Code, are to have a current ICC Evaluation Service Research Report (ICC ESR), CABO National Evaluation Report (NER), or other testing agencies as accepted by the Division of the State Architect.
2. Refer to additional requirements specified in Section 01 41 00 - Regulatory Requirements.

H. Mechanical and Plumbing: Comply with requirements specified in Divisions 22 and 23, as included in this Project Manual and in the Drawings.

I. Electrical, Communications, and Electronic Safety and Security: Comply with requirements specified in Divisions 26 and 28, as included in this Project Manual and in the Drawings.

2.02 SYSTEM COMPLETENESS

A. The Contract Drawings and Specifications are not intended to be comprehensive directions on how to produce the Work. Rather, the Drawings and Specifications are instruments of service prepared to describe the design intent for the completed Work.

B. It is intended that all equipment, systems and assemblies be complete and fully functional even though not fully described. Provide all products and operations necessary to achieve the design intent described in the Contract Documents.

C. Refer to related general requirements specified in Section 01 41 00 - Regulatory Requirements regarding compliance with minimum requirements of applicable codes, ordinances and standards.

D. Omissions and Misdescriptions: Contractor shall report to Architect immediately when elements essential to proper execution of the Work are discovered to be missing or misdescribed in the Drawings and Specifications or if the design intent is unclear.

1. Should an essential element be discovered as missing or misdescribed prior to receipt of Bids, an Addendum will be issued so that all costs may be accounted for in the Contract Sum.
2. Should an obvious omission or misdescription of a necessary element be discovered and reported after execution of the Agreement, Contractor shall provide the element as though fully and correctly described, and a no-cost Change Order shall be executed.
3. Refer to related General Requirements specified in Section 01 30 00 - Administrative Requirements regarding construction interfacing and coordination.

2.03 EXISTING PRODUCTS

A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by Contract Documents.

B. Unforeseen historic items encountered remain the property of the District; notify District promptly upon discovery; protect, remove, handle, and store as directed by District.

C. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the District, or otherwise indicated as to remain the property of the District, become the property of the Contractor; remove from site.

2.04 NEW PRODUCTS

A. Provide new products unless specifically required or permitted by Contract Documents.

1. Provide products that fully comply with the Contract Documents, are undamaged and unused at installation.
2. Comply with additional requirements specified herein in Article titled "PRODUCT OPTIONS".

B. See Section 01 40 00 - Quality Requirements, for additional source quality control requirements.

C. Use of products having any of the following characteristics is not permitted:

1. Made outside the United States, its territories, Canada, or Mexico.
2. Containing lead, cadmium, or asbestos.

D. Where other criteria are met, Contractor shall give preference to products that:

1. If used on interior, have lower emissions, as defined in Section 01 61 16.
2. If wet-applied, have lower VOC content, as defined in Section 01 61 16.

3. Are extracted, harvested, and/or manufactured closer to the location of the project.
4. Have longer documented life span under normal use.
5. Result in less construction waste. See Section 01 74 19

E. Provide interchangeable components by the same manufacturer for components being replaced.
1. To the fullest extent possible, provide products of the same kind from a single source. Products required to be supplied in quantity shall be the same product and interchangeable throughout the Work.
2. When options are specified for the selection of any of two or more products, provide product selected to be compatible with products previously selected.

F. Product Nameplates and Instructions:
1. Except for required Code-compliance labels and operating and safety instructions, locate nameplates on inconspicuous, accessible surfaces. Do not attach manufacturer's identifying nameplates or trademarks on surfaces exposed to view in occupied spaces or to the exterior.
2. Provide a permanent nameplate on each item of service-connected or power-operated equipment. Nameplates shall contain identifying information and essential operating data such as the following example:
a. Name of manufacturer
b. Name of product
c. Model and serial number
d. Capacity
e. Operating and Power Characteristics
f. Labels of Tested Compliance with Codes and Standards
3. Refer to additional requirements which may be specified in various sections, as included in this Project Manual.
4. For each item of service-connected or power-operated equipment, provide operating and safety instructions, permanently affixed and of durable construction, with legible machine lettering. Comply with all applicable requirements of authorities having jurisdiction and listing agencies.

G. Wiring Terminations: Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Size terminal lugs to CEC, include lugs for terminal box.

H. Cord and Plug: Provide minimum 6 foot cord and plug including grounding connector for connection to electric wiring system. Cord of longer length is specified in individual specification sections.

2.05 PRODUCT OPTIONS

A. Unless the specifications state that no substitution is permitted, whenever the Contract Documents indicate any specific article, device, equipment, product, material, fixture, patented process, form, method, or type of construction or any specific name, make, trade name, or catalog number, with or without the words "or equal," such specification shall be deemed to be used for the purpose of facilitating description of the material, process, or article desired and shall be deemed to be followed by the words "or equal."

1. See Section 01 25 00 - Substitution Procedures.

B. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.

1. Reference Standards:

a. Where Specifications require compliance with a standard, provided product shall fully comply with the standard specified.

b. Refer to general requirements specified in Section 01 40 00 - Quality Requirements regarding compliance with referenced standards, standard specifications, codes, practices and requirements for products.

2. Product Description:

a. Where Specifications describe a product, listing characteristics required, with or without use of a brand name, provide a product that has the specified attributes and otherwise complies with specified requirements.

3. Performance Requirements:

a. Where Specifications require compliance with performance requirements, provide product(s) that comply and are recommended by the manufacturer for the intended application.

b. Verification of manufacturer's recommendations may be by product literature or by certification of performance from manufacturer.

C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named, prior to bid .

D. Products Specified by Identification of Manufacturer and Product Name or Number:

1. "Specified Manufacturer": Provide the specified product(s) of the specified manufacturer.

a. If only one manufacturer is specified, without "acceptable manufacturers" being identified, provide only the specified product(s) of the specified manufacturer.

b. If District standard is indicated make all efforts to provide that product.

c. If the phrase "or equal" or "approved equal" is stated or reference is made to the "or equal provision," products of other manufacturers may be provided if such products are equivalent to the specified product(s) of the specified manufacturer.

1) Equivalence shall be demonstrated by submission of information in compliance with requirements of Section 01 25 00 - Substitution Procedures.

2. "Acceptable Manufacturers":

a. Product(s) of the named manufacturers, if equivalent to the specified product(s) of the specified manufacturer, will be acceptable in accordance with the requirements of Section 01 25 00 - Substitution Procedures.

1) Exception: Considerations regarding changes in Contract Time and Contract Sum will be waived if no increase in Contract Time or Contract Sum results from use of such equivalent products.

3. Unnamed manufacturers: Product(s) of unnamed manufacturers will be acceptable **when disclosed during the bidding period** and only as follows:

a. Unless specifically stated that substitutions will not be accepted or considered, the phrase "or equal" shall be assumed to be included in the description of specified product(s).

b. Equivalent products of unnamed manufacturers will be accepted in accordance with the "or equal" provision specified herein, below.

c. If provided, prior to bid, products of unnamed manufacturers shall be subject to the requirements of Section 01 25 00 - Substitution Procedures.

4. Quality basis:

a. Specified product(s) of the specified manufacturer shall serve as the basis by which products by named acceptable manufacturers and products of unnamed manufacturers will be evaluated.

b. Where characteristics of the specified product are described, where performance characteristics are identified or where reference is made to industry standards, such characteristics are specified to identify the most significant attributes of the specified product(s) which will be used to evaluate products of other manufacturers.

E. Products Specified by Combination of Methods: Where products are specified by a combination of attributes, including manufacturer's name, product brand name, product catalog or identification number, industry reference standard, or description of product characteristics, provide products conforming to all specified attributes.

F. "Or Equal" Provision: Where the phrase "or equal" or the phrase "or approved equal" is included, equivalent product(s) of unnamed manufacturer(s) may be provided as specified above in subparagraph titled "Unnamed manufacturers" and Section 01 25 00 - Substitution Procedures with the following conditions:

1. The requirements of Section 01 25 00 - Substitution Procedures applies to products provided under the "or equal" provision.

a. Exception: If the proposed product(s) are determined to be equivalent to the specified product(s) of the specified manufacturer, the requirement specified for substitutions to result in a net reduction in Contract Time or Contract Sum may be waived.

2. Use of product(s) under the "or equal" provision shall not result in any delay in completion of the Work, including completion of portions of the Work for use by District or for work under separate contract by District.

3. Use of product(s) under the "or equal" provision shall not result in any costs to the District, including design fees and permit and plan check fees.

4. Use of product(s) under the "or equal" provision shall not require substantial change in the intent of the design, in the opinion of the Architect.
    a. The intent of the design shall include functional performance and aesthetic qualities.
5. The determination of equivalence will be made by the Architect and District, and such determination shall be final.

G. Visual Matching:
1. Where Specifications require matching a sample, the decision by the Architect on whether a proposed product matches shall be final.
2. Where no product visually matches but the product complies with other requirements, comply with provisions for substitutions for selection of a matching product in another category.

H. Visual Selection of Products:
1. Where requirements include the phrase "as selected from manufacturer's standard colors, patterns and textures", or a similar phrase, selections of products will be made by indicated party or, if not indicated, by the Architect. The will select color, pattern and texture from the product line of submitted manufacturer, if all other specified provisions are met.
2. The Architect will select color, pattern and texture from the product line of submitted manufacturer, if all other specified provisions are met.

2.06 MAINTENANCE MATERIALS

A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.

B. Deliver to Project site; obtain receipt prior to final payment.

PART 3 EXECUTION

3.01 SUBSTITUTION LIMITATIONS

A. See Section 01 25 00 - Substitution Procedures.

3.02 OWNER-SUPPLIED PRODUCTS

A. See Section 01 10 00 - Summary for identification of District-supplied products.

B. District's Responsibilities:
1. Arrange for and deliver District reviewed shop drawings, product data, and samples, to Contractor.
2. Arrange and pay for product delivery to site.
3. On delivery, inspect products jointly with Contractor.
4. Submit claims for transportation damage and replace damaged, defective, or deficient items.
5. Arrange for manufacturers' warranties, inspections, and service.

C. Contractor's Responsibilities:

1. Review District reviewed shop drawings, product data, and samples.
2. Receive and unload products at site; inspect for completeness or damage jointly with District.
3. Handle, store, install and finish products.
4. Repair or replace items damaged after receipt.

3.03 TRANSPORTATION AND HANDLING

A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.

B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.

C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.

1. Schedule delivery to minimize long-term storage and prevent overcrowding construction spaces.
2. Coordinate with installation to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other losses.

D. Transport and handle products in accordance with manufacturer's instructions.

E. Transport products by methods to avoid product damage.

F. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.

G. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

H. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.

I. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.04 STORAGE AND PROTECTION

A. Provide protection of stored materials and products against theft, casualty, or deterioration.

B. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication. See Section 01 74 19.

1. Structural Loading Limitations: Handle and store products and materials so as not to exceed static and dynamic load-bearing capacities of project floor and roof areas.

C. Inspection Provisions: Arrange storage to provide access for inspection and measurement of quantity or counting of units.

D. Structural Considerations: Store heavy materials away from the structure in a manner that will not endanger supporting construction.

E. Store and protect products in accordance with manufacturers' instructions.

F. Store with seals and labels intact and legible.

G. Arrange storage of materials and products to allow for visual inspection for the purpose of determination of quantities, amounts, and unit counts.

H. Store sensitive products in weathertight, climate-controlled enclosures in an environment favorable to product.

I. For exterior storage of fabricated products, place on sloped supports above ground.

1. Place products on raised blocks, pallets or other supports, above ground and in a manner to not create ponding or misdirection of runoff.

J. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.

1. Execute a formal supplemental agreement between District and Contractor allowing off-site storage, for each occurrence.

K. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.

1. Periodically inspect to ensure products are undamaged, and are maintained under required conditions.

2. Remove and replace products damaged by improper storage or protection with new products at no change in Contract Sum or Contract Time.

3. Weather-Resistant Storage:

a. Store moisture-sensitive products above ground, under cover in a weathertight enclosure or covered with an impervious sheet covering. Provide adequate ventilation to avoid condensation.

b. Maintain storage within temperature and humidity ranges required by manufacturer's instructions.

c. Store loose granular materials on solid surfaces in a well-drained area. Prevent mixing with foreign matter.

L. Comply with manufacturer's warranty conditions, if any.

M. Do not store products directly on the ground.

N. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

O. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

P. Prevent contact with material that may cause corrosion, discoloration, or staining.

Q. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

R. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

3.05 INSTALLATION OF PRODUCTS

A. Comply with manufacturer's instructions and recommendations for installation of products, except where more stringent requirements are specified, are necessary due to Project conditions or are required by authorities having jurisdiction.

B. Anchor each product securely in place, accurately located and aligned with other Work.

C. Clean exposed surfaces and provide protection to ensure freedom from damage and deterioration at time of Completion review. Refer to additional requirements specified in General Conditions along with Section 01 50 00 - Temporary Facilities and Controls and Section 01 70 00 - Execution and Closeout Requirements.

3.06 PROTECTION OF COMPLETED WORK

A. Provide barriers, substantial coverings and notices to protect installed Work from traffic and subsequent construction operations.

B. Remove protective measures when no longer required and prior to Completion review of the Work.

C. Comply with additional requirements specified in Section 01 50 00 - Temporary Construction Facilities and Controls.

END OF SECTION

SECTION 01 61 16
VOLATILE ORGANIC COMPOUND (VOC) CONTENT RESTRICTIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements for Indoor-Emissions-Restricted products.

B. Requirements for VOC-Content-Restricted products.

C. Requirement for installer certification that they did not use any non-compliant products.

1.02 RELATED REQUIREMENTS

A. Section 01 30 00 - Administrative Requirements: Submittal procedures.

B. Section 01 40 00 - Quality Requirements: Procedures for testing and certifications.

C. Section 01 60 00 - Product Requirements: Fundamental product requirements, substitutions and product options, delivery, storage, and handling.

D. Section 07 92 00 - Joint Sealants: Emissions-compliant sealants.

1.03 DEFINITIONS

A. Indoor-Emissions-Restricted Products: All products in the following product categories, whether specified or not:

1. Interior paints and coatings applied on site.
2. Interior adhesives and sealants applied on site, including flooring adhesives.
3. Flooring.
4. Composite wood.
5. Products making up wall and ceiling assemblies.
6. Thermal and acoustical insulation.
7. Other products when specifically stated in the specifications.

B. VOC-Content-Restricted Products: All products in the following product categories, whether specified or not:

1. Exterior and interior paints and coatings.
2. Exterior and interior adhesives and sealants, including flooring adhesives.
3. Wet-applied roofing and waterproofing.
4. Other products when specifically stated in the specifications.

C. Interior of Building: Anywhere inside the exterior weather barrier.

D. Adhesives: All gunnable, trowelable, liquid-applied, and aerosol adhesives, whether specified or not; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.

E. Sealants: All gunnable, trowelable, and liquid-applied joint sealants and sealant primers, whether specified or not; including firestopping sealants and duct joint sealers.

F. Inherently Non-Emitting Materials: Products composed wholly of minerals or metals, unless they include organic-based surface coatings, binders, or sealants; and specifically the following:
   1. Concrete.
   2. Clay brick.
   3. Metals that are plated, anodized, or powder-coated.
   4. Glass.
   5. Ceramics.
   6. Solid wood flooring that is unfinished and untreated.

1.04 REFERENCE STANDARDS

A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency.

B. ASTM D3960 - Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings.

C. CAL (CDPH SM) - Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers Version 1.2.

D. CARB (ATCM) - Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products.

E. CARB (SCM) - Suggested Control Measure for Architectural Coatings; California Air Resources Board.

F. CHPS (HPPD) - High Performance Products Database.

G. CRI (GL) - Green Label Testing Program - Certified Products.

H. CRI (GLP) - Green Label Plus Testing Program - Certified Products.

I. GreenSeal GS-36 - Standard for Adhesives for Commercial Use.

J. SCAQMD 1113 - Architectural Coatings.

K. SCAQMD 1168 - Adhesive and Sealant Applications.

L. SCS (CPD) - SCS Certified Products.

M. UL (GGG) - GREENGUARD Gold Certified Products.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: For each VOC-restricted product used in the project, submit evidence of compliance.

C. Installer Certifications Regarding Prohibited Content: Require each installer of any type of product (not just the products for which VOC restrictions are specified) to certify that either 1) no adhesives, joint sealants, paints, coatings, or composite wood or agrifiber products have been used in the installation of installer's products, or 2) that such products used comply with these requirements.
   1. Use the form following this section for installer certifications.

D. Verification of compliance with VOC limits as specified in the CalGreen Code Section 5.504 shall be provided at the request of the Building Inspector.
   1. Product certification and specifications.
   2. Chain of custody certifications.
   3. Product, labeled and invoiced as meeting the Composite Wood Products regulation.
   4. Exterior grade products marked as meeting the PS-1 or PS-2 standards of the Engineered Wood Association, the Australian AS/NZS 2269 or European 636 3S standards
   5. Other methods approved by the building official.

E.

1.06 QUALITY ASSURANCE

A. Indoor Emissions Standard and Test Method: CAL (CDPH SM), using Standard Private Office exposure scenario and the allowable concentrations specified in the method, and range of total VOC's after 14 days.
   1. Wet-Applied Products: State amount applied in mass per surface area.
   2. Paints and Coatings: Test tinted products, not just tinting bases.
   3. Evidence of Compliance: Acceptable types of evidence are the following;
      a. Current UL (GGG) certification.
      b. Current SCS (CPD) Floorscore certification.
      c. Current SCS (CPD) Indoor Advantage Gold certification.
      d. Current listing in CHPS (HPPD) as a low-emitting product.
      e. Current CRI (GLP) certification.
      f. Test report showing compliance and stating exposure scenario used.
   4. Product data submittal showing VOC content is NOT acceptable evidence.
   5. Manufacturer's certification without test report by independent agency is NOT acceptable evidence.

B. VOC Content Test Method: 40 CFR 59, Subpart D (EPA Method 24), or ASTM D3960, unless otherwise indicated.
   1. Evidence of Compliance: Acceptable types of evidence are:
      a. Report of laboratory testing performed in accordance with requirements.
      b. Published product data showing compliance with requirements.
      c. Certification by manufacturer that product complies with requirements.

C. Composite Wood Emissions Standard: CARB (ATCM) for ultra-low emitting formaldehyde (ULEF) resins.
   1. Evidence of Compliance: Acceptable types of evidence are:
      a. Current SCS "No Added Formaldehyde (NAF)" certification; www.scscertified.com.
      b. Report of laboratory testing performed in accordance with requirements.
      c. Published product data showing compliance with requirements.

d. Certification by manufacturer that product complies with requirements.

D. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

A. All VOC restricted products shall be compliant with local jursidiction, South Coast Air Quality Management District, and Caifornia Green Standards Code, Rules and Regulations in effect at the time of installation. Products specified in this project shall be used as a basis of design. Updated products that are compliant with the rules in force at the time of installation shall be submitted as substitutions when they become available.

1. If a product is found to be non-compliant with the VOC rules at the scheduled time of installation, notify the Architect a minimum of 90 days prior to installation. Contractor shall submit a suggested compliant product that is equal to the performance and cost of the specified product using the substitution procedure.

2.02 MATERIALS

A. All Products: Comply with the most stringent of federal, State, and local requirements, or these specifications.

B. Indoor-Emissions-Restricted Products: Comply with Indoor Emissions Standard and Test Method, except for:

1. Composite Wood, Wood Fiber, and Wood Chip Products: Comply with Composite Wood Emissions Standard or contain no added formaldehyde resins.
    a. Comply with CalGreen Building Standards Section 5.504.4.5, Table 504.4.4.5 "Formaldehyde Limits".
2. Inherently Non-Emitting Materials.

C. VOC-Content-Restricted Products: VOC content not greater than required by the following:

1. Adhesives, Including Flooring Adhesives: SCAQMD 1168 Rule.
2. Aerosol Adhesives: GreenSeal GS-36.
3. Joint Sealants: SCAQMD 1168 Rule.
4. Paints and Coatings: Each color; most stringent of the following:
    a. 40 CFR 59, Subpart D.
    b. SCAQMD 1113 Rule.
    c. CARB (SCM).
    d. CalGreen Building Standards Section 5.504, Table 504.4.3 "VOC Content Limits for Architectural Coatings".
    e. Clear Wood Finishes, Floor Coatings, Stains, Primers and Shellacs: Do not exceed the VOC content limits established in SCAQMD 1113 rule.
5. Wet-Applied Roofing and Waterproofing: Comply with requirements for paints and coatings.

6. Carpet, Carpet Tile, and Adhesive: Provide products having VOC content not greater than that required for CRI (GLP) certification.
    a. Comply with CalGreen Building Standards Section 5.504, Table 504.4.1 "Adhesive VOC Limit".
7. Carpet Cushion: Provide products having VOC content not greater than that required for CRI (GL) certification.
    a. Comply with CalGreen Building Standards Section 5.504, Table 504.4.1 "Adhesive VOC Limit".

D. Other Product Categories: Comply with limitations specified elsewhere.

PART 3 EXECUTION

3.01 FIELD QUALITY CONTROL

A. District reserves the right to reject non-compliant products, whether installed or not, and require their removal and replacement with compliant products at no extra cost to District.

B. Additional costs to restore indoor air quality due to installation of non-compliant products will be borne by Contractor.

END OF SECTION

SECTION 01 61 16.01
ACCESSORY MATERIAL VOC CONTENT CERTIFICATION FORM

FORM

1.01 IDENTIFICATION:

A. Project Name: William Collier ES Shade Structure and Playground Improvements

B. Project No.: 24006.00

C. Architect: tBP/Architecture

1.02 USE OF THIS FORM:

A. Because installers are allowed and directed to choose accessory materials suitable for the applicable installation, there is a possibility that such accessory materials might contain VOC content in excess of that permitted, especially where such materials have not been explicitly specified.

1. Each installer of work on this project is required to certify that his/their use of these particular materials complies with the contract documents and to provide documentation showing that the products used do not contain the prohibited content.

B. Contractor is required to obtain and submit this form from each installer of work on this project.

C. For each product category listed, check the correct paragraph.

D. If any of these accessory materials has been used, attach to this form product data and MSDS sheet for each such product.

1.03 VOC CONTENT RESTRICTIONS ARE SPECIFIED IN SECTION 01 61 16.

A. Volatile organic compounds (VOCs) are defined by the U.S. EPA, California Air Resources Board (CARB), South Coast Air Quality Management District (SCAQMD), along with other state and local regulations applicable to this project.

2.01 PRODUCT CERTIFICATION

A. I certify that the installation work of my firm on this project:

1. [HAS] [HAS NOT] required the use of any ADHESIVES.
2. [HAS] [HAS NOT] required the use of any JOINT SEALANTS.
3. [HAS] [HAS NOT] required the use of any PAINTS OR COATINGS.
4. [HAS] [HAS NOT] required the use of any COMPOSITE WOOD or AGRIFIBER PRODUCTS.

B. Product data and MSDS sheets are attached.

3.01 CERTIFIED BY: (INSTALLER/MANUFACTURER/SUPPLIER FIRM)

A. Firm Name: _____

B. Print Name: _____

C. Signature: _____

D. Title: _____ (officer of company)

E. Date: _____

END OF SECTION

SECTION 01 70 00
EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Examination, preparation, and general installation procedures.

B. Requirements for alterations work, including selective demolition.

C. Pre-installation meetings.

D. Cutting and patching.

E. Surveying for laying out the work.

F. Cleaning and protection.

G. Starting of systems and equipment.

H. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.

I. General requirements for maintenance service.

1.02 RELATED REQUIREMENTS

A. Section 01 30 00 - Administrative Requirements: Submittals procedures.

B. Section 01 40 00 - Quality Requirements: Testing and inspection procedures.

C. Section 01 45 33 - Code-Required Special Inspections and Procedures: Construction oversight procedures by Division of the State Architect regarding the execution, approval, and closeout of this building project.

D. Section 01 50 00 - Temporary Facilities and Controls: Temporary exterior enclosures.

E. Section 01 50 00 - Temporary Facilities and Controls: Temporary interior partitions.

F. Section 01 74 19 - Construction Waste Management and Disposal: Additional procedures for trash/waste removal, recycling, salvage, and reuse.

G. Section 01 78 00 - Closeout Submittals: Project record documents, operation and maintenance data, warranties, and bonds.

H. Section 01 79 00 - Demonstration and Training: Demonstration of products and systems to be commissioned and where indicated in specific specification sections

I. Section 02 41 00 - Demolition: Demolition of whole structures and parts thereof; site utility demolition.

J. Individual Product Specification Sections:

1. Advance notification to other sections of openings required in work of those sections.
2. Limitations on cutting structural members.

1.03 REFERENCE STANDARDS

A. CBC Chapter 11B - California Building Code-Chapter 11B.

B. CBC Chapter 33 - Safeguards During Construction.

C. CFC Chapter 33 - California Fire Code - Chapter 33 - Fire Safety during Construction and Demolition.

D. CFC Chapter 35 - California Fire Code - Chapter 35 - Welding and other Hot Work.

E. DSA BU 24-05 - Fire Safety During Construction and Demolition.

F. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Survey work: Submit name, address, and telephone number of Surveyor before starting survey work.

1. On request, submit documentation verifying accuracy of survey work.
2. Submit a copy of site drawing signed by the Land Surveyor, that the elevations and locations of the work are in compliance with Contract Documents.
3. Submit surveys and survey logs for the project record.

C. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:

1. Structural integrity of any element of Project.
2. Integrity of weather exposed or moisture resistant element.
3. Efficiency, maintenance, or safety of any operational element.
4. Visual qualities of sight exposed elements.
5. Work of District or separate Contractor.
6. Include in request:
    a. Identification of Project.
    b. Location and description of affected work.
    c. Necessity for cutting or alteration.
    d. Description of proposed work and products to be used.
    e. Effect on work of District or separate Contractor.
    f. Effect on existing construction of District and, if applicable, work for Project being provided by District under separate contract.
    g. Written permission of affected separate Contractor.
    h. Date and time work will be executed.
7. Include written evidence that those performing work under separate contract for District have been notified and acknowledge that cutting and patching work will be occurring. Include written permission for intended cutting and patching, included scheduled times.

D. Project Record Documents: Accurately record actual locations of capped and active utilities.

1.05 QUALIFICATIONS

A. For demolition work, employ a firm specializing in the type of work required.

1. Minimum of 5 years of documented experience.

B. For surveying work, employ a land surveyor registered in California and acceptable to Architect. Submit evidence of surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate. Employ only individual(s) trained and experienced in collecting and recording accurate data relevant to ongoing construction activities,

C. For field engineering, employ a professional engineer of the discipline required for specific service on Project, licensed in California. Employ only individual(s) trained and experienced in establishing and maintaining horizontal and vertical control points necessary for laying out construction work on project of similar size, scope and/or complexity.

D. For design of temporary shoring and bracing, employ a Professional Engineer experienced in design of this type of work and licensed in California.

1.06 PROJECT CONDITIONS

A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.

B. Protect site from puddling or running water.

C. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

D. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.

1. Provide dust-proof enclosures to prevent entry of dust generated outdoors.

E. Erosion and Sediment Control: Plan and execute work by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.

1. Minimize amount of bare soil exposed at one time.
2. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.
3. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.
4. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

F. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.

1. At All Times: Excessively noisy tools and operations will not be tolerated inside the building at any time of day; excessively noisy includes jackhammers, pneumatic hammers, and air-operated nail guns.

G. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.

H. Rodent Control: Provide methods, means, and facilities to prevent rodents from accessing or invading premises.

I. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

1.07 COORDINATION

A. See Section 01 10 00 for occupancy-related requirements.

B. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

C. Notify affected utility companies and comply with their requirements.

D. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

E. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on drawings. Follow routing indicated for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

F. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

G. Coordinate completion and clean-up of work of separate sections.

H. After District occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of District's activities.

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

A. New Materials: As specified in product sections; match existing products and work for patching and extending work.

B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.

C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.

E. Verify that utility services are available, of the correct characteristics, and in the correct locations.

F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 PREINSTALLATION MEETINGS

A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.

1. Coordinate operations of the various trades to assure efficient and orderly installation of each part of Work.

2. Coordinate Work operations of the various trades that depend on each other for proper installation, connection, and operation of Work, including but not limited to:

a. Schedule construction operations in sequence required where installation of one part of Work depends on installation of other components, before or after its own installation.

b. Coordinate installation of different components to assure maximum accessibility for required maintenance, service, and repair.

c. Provide provisions to accommodate items scheduled for later installation.

B. Require attendance of parties directly affecting, or affected by, work of the specific section.

C. Notify Architect four days in advance of meeting date.

D. Prepare agenda and preside at meeting:

1. Review conditions of examination, preparation and installation procedures.

2. Review coordination with related work.

E. Record minutes and distribute copies within two days after meeting to participants, with electronic copies to Architect, District, participants, and those affected by decisions made.

3.04 LAYING OUT THE WORK

A. Verify locations of survey control points prior to starting work.

B. Promptly notify Architect of any discrepancies discovered.

C. Protect survey control points prior to starting site work; preserve permanent reference points during construction.

D. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.

E. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.

F. Utilize recognized engineering survey practices.

G. Establish a minimum of two permanent bench marks on site, referenced to established control points. Record locations, with horizontal and vertical data, on project record documents.

H. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:

1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
2. Grid or axis for structures.
3. Building foundation, column locations, ground floor elevations.

I. Periodically verify layouts by same means.

J. Maintain a complete and accurate log of control and survey work as it progresses.

3.05 GENERAL INSTALLATION REQUIREMENTS

A. Dimensions for Accessibility:

1. Conventions: See CBC Chapter 11B Figure 11B-104. Dimensions that are not stated as "maximum" or "minimum" are absolute.
2. Tolerances shall be per CBC Chapter 11B-104.1.1 "Construction and manufacturing tolerances. All dimensions are subject to conventional industry tolerances except where the requirement is stated as a range with specific minimum and maximum end points."

B. In addition to compliance with regulatory requirements, conduct construction operations in compliance with CBC Chapter 33, CFC Chapter 33, CFC Chapter 35, and NFPA 241, including applicable recommendations in Appendix A.

1. When welding or doing other hot work, comply with CFC Chapter 35.
2. Provide a Site Fire Safety Plan prior to the start of work, in coordination with the local fire authority. Comply with DSA BU 24-05.
    a. A Site Fire Safety Plan and form DSA 102-IC: Construction Start Notice/Inspection Card Request for submittal through the Architect to the Division of the State Architect.
    b. At a minimum, the site fire safety plan shall include the following information required in CFC Section 3303.1.1.
        1) Name and contact information of site safety director.
        2) Documentation of training of the site safety director and fire watch personnel.
        3) Procedures for reporting emergencies.
        4) Fire department vehicle access routes.
        5) Locations of fire protection equipment, including portable fire extinguishers, standpipes, fire department connections and fire hydrants.

6) Smoking and cooking policies, designated area to be used where approved, and signage locations in accordance with CFC Section 3305.8.

7) Location and safety considerations for temporary heating equipment.

8) Hot work (welding, roofing, etc.) plan.

9) Plans for control of combustible waste.

10) Locations and methods for storage and use of flammable and combustible liquids and other hazardous materials.

11) Provisions for site security.

12) Changes that affect this plan.

13) Other site specific information requested by the local fire authority (LFA).

C. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.

D. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

E. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.

F. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.

G. Make neat transitions between different surfaces, maintaining texture and appearance.

3.06 ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.

1. Verify that construction and utility arrangements are as indicated.

B. Keep areas in which alterations are being conducted separated from other areas that are still occupied.

1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 01 50 00 .

C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.

1. Where openings in exterior enclosure exist, provide construction to make exterior enclosure weatherproof.

2. Insulate existing ducts or pipes that are exposed to outdoor ambient temperatures by alterations work.

D. Remove existing work as indicated and as required to accomplish new work.

1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction specified.

2. Remove items indicated on drawings.

3. Relocate items indicated on drawings.

4. Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.
5. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.

E. Services (Including but not limited to HVAC, Plumbing, and Electrical): Remove, relocate, and extend existing systems to accommodate new construction.
1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access or provide access panel.
2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.
3. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
4. Verify that abandoned services serve only abandoned facilities.
5. Remove abandoned pipe, ducts, conduits, and equipment , including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification; patch holes left by removal using materials specified for new construction.

F. Protect existing work to remain.
1. Prevent movement of structure; provide shoring and bracing if necessary.
2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
3. Repair adjacent construction and finishes damaged during removal work.

G. Adapt existing work to fit new work: Make as neat and smooth transition as possible.
1. When existing finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Architect.
2. Where removal of partitions or walls results in adjacent spaces becoming one, rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.
3. Where a change of plane of 1/4 inch or more occurs in existing work, submit recommendation for providing a smooth transition for Architect review and request instructions.
4. Trim existing wood doors as necessary to clear new floor finish. Refinish trim as required.

H. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.

I. Refinish existing surfaces as indicated:

1. Where rooms or spaces are indicated to be refinished, refinish all visible existing surfaces to remain to the specified condition for each material, with a neat transition to adjacent finishes.
2. If mechanical or electrical work is exposed accidentally during the work, re-cover and refinish to match.

J. Clean existing systems and equipment.

K. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.

L. Do not begin new construction in alterations areas before demolition is complete.

M. Comply with all other applicable requirements of this section.

3.07 CUTTING AND PATCHING

A. Whenever possible, execute the work by methods that avoid cutting or patching.

B. See Alterations article above for additional requirements.

C. Perform whatever cutting and patching is necessary to:
1. Complete the work.
2. Fit products together to integrate with other work.
3. Provide openings for penetration of mechanical, electrical, and other services.
4. Match work that has been cut to adjacent work.
5. Repair areas adjacent to cuts to required condition.
6. Repair new work damaged by subsequent work.
7. Remove samples of installed work for testing when requested.
8. Remove and replace defective and non-complying work.

D. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.
1. Coordinate installation or application of products for integrated Work.
2. Uncover completed Work as necessary to install or apply products out of sequence.
3. Remove and replace defective or non-conforming Work.
4. Provide openings for penetration of utility services, such as plumbing, mechanical and electrical Work.

E. After uncovering existing Work, inspect conditions affecting proper accomplishment of Work.

F. Temporary Supports: Provide supports to ensure structural integrity of the Work. Provide devices and methods to protect other portions of Project from damage.

G. Beginning of cutting or patching shall be interpreted to mean that existing conditions were found by Contractor to be acceptable.

H. Employ skilled and experienced installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.

I. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

1. Use a diamond grit abrasive saw or similar cutter for smooth edges. Do not overcut corners.

J. Restore work with new products in accordance with requirements of Contract Documents.

K. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

L. Fit work neat and tight allowing for expansion and contraction.

M. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material , to full thickness of the penetrated element.

N. Patching:

1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
2. Match color, texture, and appearance.
3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

O. Finishing: Refinish surfaces to match adjacent and similar finishes as used for the Project.

1. For continuous surfaces, refinish to nearest intersection or natural break.
2. For an assembly, refinish entire unit.

3.08 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.

C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

D. Collect and remove waste materials, debris, and trash/rubbish from site weekly and dispose off-site; do not burn or bury.

3.09 PROTECTION OF INSTALLED WORK

A. Protect installed work from damage by construction operations.

B. Provide special protection where specified in individual specification sections.

C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

F. Protect work from spilled liquids. If work is exposed to spilled liquids, immediately remove protective coverings, dry out work, and replace protective coverings.

G. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

H. Prohibit traffic from landscaped areas.

I. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

3.10 SYSTEM STARTUP

A. Coordinate schedule for start-up of various equipment and systems.

B. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.

C. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

D. Verify that wiring and support components for equipment are complete and tested.

E. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.

F. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.

G. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.11 DEMONSTRATION AND INSTRUCTION

A. See Section 01 79 00 - Demonstration and Training.

3.12 ADJUSTING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.

B. Testing, adjusting, and balancing HVAC systems: See Division 23 - HVAC.

3.13 FINAL CLEANING

A. Execute final cleaning prior to final project assessment.

1. Clean areas to be occupied by District prior to final completion before District occupancy.

B. Use cleaning materials that are nonhazardous.

1. Cleaning Agents and Materials: Use only those cleaning agents and materials which will not create hazards to health or property and which will not damage or degrade surfaces.

a. Use only those cleaning agents, materials and methods recommended by manufacturer of the material to be cleaned.

b. Use cleaning materials only on surfaces recommended by cleaning agent manufacturer.

c. Before use, review cleaning agents and materials with Owner Representative for suitability and compatibility. Use no cleaning agents and materials without approval as noted above.

2. Cleaning Procedures: All cleaning processes, agents and materials shall be subject to Architect, District and/or Owner Representative review and approval. Processes and degree of cleanliness shall be as directed by Architect, District and/or Owner Representative.

C. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.

D. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.

E. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.

F. Clean filters of operating equipment.

G. Clean debris from roofs, gutters, downspouts, scuppers, overflow drains, area drains, and drainage systems.

H. Clean site; sweep paved areas, rake clean landscaped surfaces.

I. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.14 PROJECT CLOSEOUT CONFERENCE

A. Schedule and conduct a project closeout conference, at a time convenient to District and Architect, but no later than 90 days prior to the scheduled date of Completion.

1. Conduct the conference to review requirements and responsibilities related to Project closeout.

2. Attendees: Authorized representatives of District, Commissioning Authority (CxA), Architect, and relevant consultants; Contractor and project superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.

3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:

a. Preparation of record documents.

b. Procedures required prior to inspection for Completion and for final inspection for acceptance.

c. Submittal of written warranties.

d. Coordination of separate contracts.

e. Installation of District's furniture, fixtures, and equipment.

f. Responsibility for removing temporary facilities and controls.

4. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, District, participants, and those affected by decisions made.

3.15 CLOSEOUT PROCEDURES

A. Make submittals that are required by governing or other authorities.

1. Provide copies to Architect and District.

B. Accompany District, Architect, and Owner Representative on preliminary inspection to determine items to be listed for completion or correction in the Contractor's Correction Punch List for Contractor's comprehensive list of items to be completed or corrected.

1. As authorized by the District; Architect and Architect's / District's consultants, as appropriate, will attend a meeting at the Project site to review Contract closeout procedures and to review the list of items to be completed and corrected (punch list) to make the Work ready for acceptance by the District.
2. This meeting shall be scheduled not earlier than 14 days prior to the date anticipated for the Final Inspection review.

C. Notify Architect when work is considered ready for Architect's Final Inspection.

D. Submit written certification containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's Final Inspection.

1. Final Application for Payment: In the Application for Payment that coincides with the date Final Inspection/Completion is claimed, show 100 percent completion for the portion of the Work claimed substantially complete.
2. Warranties, Bonds and Certificates: Submit specific warranties, guarantees, workmanship bonds, maintenance agreements, final certifications and similar documents.
3. Locks and Keys: Change temporary lock cylinders over to permanent keying and transmit keys to the District, unless otherwise directed or specified.
4. Tests and Instructions: Complete start-up testing of systems, and instruction of the District's personnel. Remove temporary facilities from the site, along with construction tools, mock-ups, and similar elements.

E. Clearing and Cleaning: Prior to the Final Inspection review, Contractor shall conduct a thorough cleaning and clearing of the Project area, including removal of construction facilities and temporary controls.

F. Inspection and Testing: Prior to the Final Inspection review, complete inspection and testing required for the Work, including securing of approvals by authorities having jurisdiction.

1. Complete all inspections, tests, balancing, sterilization and cleaning of plumbing and HVAC systems.
2. Complete inspections and tests of electrical power and signal systems.

G. District will occupy all of the building as specified in Section 01 10 00.

H. Conduct Final inspection and create Final Correction Punch List containing Architect's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Architect.

1. Correction (Punch) List: Contractor shall prepare and distribute at the preliminary Contract closeout review meeting, a typewritten, comprehensive list of items to be completed and corrected (punch list) to make the Work ready for acceptance by the District.

    a. Include all items to be completed or corrected prior to the Contractor's application for final payment.

    b. Identify items by location (room number or name) and consecutive number. For example, 307-5 would identify item 5 in Room 307, Roof-4 would identify item 4 on Roof.

    c. Prepare separate lists according to categories used for Drawings. For example, provide lists for Architectural, Structural, Plumbing, Mechanical, Electrical, Fire Protection, Civil, and Landscape.

    d. Architect, Architect's consultants and District's consultants, if in attendance, will conduct a brief walk-through of Project with the Contractor to review scope and adequacy of the punch list.

    e. Verbal comments will be made to the Contractor by the DSA, the Architect and the Architect's and District's consultants, if in attendance, during the walk-through. These comments will indicate generally the additions and corrections to be made to the punch list. Such comments shall not be considered to be comprehensive; Contractor shall use the comments as guidance in preparing the punch list for the Final Inspection review.

2. Final Inspection Meeting: On a date mutually agreed by the District, Architect, and Contractor, a meeting shall be conducted at the Project site to determine whether the Work is satisfactory and complete for filing a Notice of Completion.

    a. Contractor shall provide three working days notice to Architect for requested date of Final Inspection meeting.

    b. The Owner Representative, the Architect with Architect's / District's consultants, as authorized by the District, will attend the Final Inspection meeting.

    c. In addition to conducting a walk-through of the facility and reviewing the punch list, the purpose of the meeting shall include submission of warranties, guarantees and bonds to the District, submission of operation and maintenance data (manuals), provision of specified extra materials to the District, and submission of other Contract closeout documents and materials as required and if not already submitted.

    d. The Owner Representative, Architect and Architect's consultants, as appropriate, will conduct a walk-through of the facility with the Contractor and review the punch list.

    e. Contractor shall correct the punch list and record additional items as may identified during the walk-through, including notations of corrective actions to be taken.

f. Retype the punch list and distribute it within three working days to those attending the meeting.

g. If additional site visits by the Owner Representative, the Architect and the Architect's and District's consultants are required to review completion and correction of the Work, the costs of additional visits shall be reimbursed to the District by the Contractor by deducting such costs from the Final Payment.

I. Correct items of work listed in Final Correction Punch List and comply with requirements for access to District-occupied areas.

J. Notify Architect when work is considered finally complete and ready for Architect's Final Inspection.

3.16 FINAL PAYMENT

A. After completion of all items listed for completion and correction, after submission of all documents and products and after final cleaning, submit final Application for Payment, identifying total adjusted Contract Sum, previous payments and sum remaining due.

B. Payment will not be signed off by the Architect until the following are accomplished:

1. All Project Record Documents have been transferred and accepted by District.
2. All extra materials and maintenance stock have been transferred and received by District.
3. All warranty documents and operation and maintenance data have been received and accepted by District.
4. All liens have been released or bonded by Contractor.
5. Contractor's surety has consented to Final Payment.
6. All documentation required by DSA has been completed.

3.17 MAINTENANCE

A. Provide service and maintenance of components indicated in specification sections.

B. Maintenance Period: As indicated in specification sections or, if not indicated, not less than one year from the Date of Project Completion or the length of the specified warranty, whichever is longer.

C. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.

D. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.

E. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the District.

END OF SECTION

SECTION 01 71 23
FIELD ENGINEERING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Surveying requirements for the Work.

1.02 RELATED SECTIONS

A. Section 31 20 00: Earthwork

B. Section 32 12 16: Asphalt Paving

1.03 SURVEY SERVICE

A. Unless otherwise stated by the Architect or noted in the Special Provisions, the CONTRACTOR shall provide all surveying services.

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION

3.01 SUBMITTALS

A. CONTRACTOR shall submit the name and address of the State of California licensed surveyor to Construction Management Representative (CMR), ARCHITECT and OWNER including any changes as they may occur.

B. CONTRACTOR shall submit to OWNER copies of cut sheets, coordinate plots, data collector printouts, and other documentation as available to verify completeness and/or accuracy of field surveying work.

C. Statement of Compliance: CONTRACTOR shall submit a statement of certification signed and sealed by Surveyor, counter-signed by CONTRACTOR indicating compliance with grade elevations, slopes and tolerances.

3.02 LAYOUT OF THE WORK

A. CONTRACTOR shall employ a State of California licensed surveyor to lay out the entire Work, set grades, lines, levels, control points, vertical and horizontal control, elevations, grids and positions. Before the commencement of Work, surveyor shall, in conjunction with OWNER and Construction Management Representative (CMR) provided engineering survey of the Project site, locate all reference points and benchmarks, then

lay out all lines, elevations, and measurements for the entire Work including but not limited to, buildings, grading, paving and utilities.

B. All work under this contract shall be built in accordance with the lines and grades shown on the plans. Field survey for establishing these, and for the control of construction, shall be the responsibility of the Contractor. All such survey work including construction staking shall be done under the supervision of a California Licensed Land Surveyor or authorized Civil Engineer. Staking shall be done on all items ordinarily requiring grade and alignment, at intervals normally accepted by the agencies and trade involved.

C. The CONTRACTOR shall be responsible for any errors in the finished work, and shall notify the Engineer, in writing, within 24 hours, of any discrepancies, or design errors during the construction staking.

D. Contractor shall immediately remediate any areas found not to meet specification requirements.

3.03 SURVEY REQUIREMENTS

A. Establish a minimum of two permanent horizontal and vertical control points on the Project site, remote from the work area, referenced to data established by the survey control points.

B. Indicate the reference points on the project record drawings with the basis of elevation being the established benchmarks.

C. Establish lines, grades, locations and dimensions by instrumentation. From time to time, verify the layout of all Work by the same methods.

D. Provide grade stakes and elevations to construct over excavation and re-compaction, rough and final grades, paved areas, curbs, gutters, sidewalks, building pads, landscaped areas, and other areas as required.

E. Calculate and layout proposed finished elevations and intermediate control as required to provide smooth transitions between the spot elevations indicated in the Contract Documents.

F. Provide stakes and elevations for grading, fill, and topsoil placement.

G. Provide adequate horizontal and vertical control to locate utility lines, including but not limited to, storm, sewers, water mains, gas, electric and signal and provide vertical control in proportion to the slope of the line as required for accurate construction. Dry utilities will be based upon adequate horizontal and vertical control layout. Prior to trench closure, survey and record invert and flow line elevations. Survey and record top of curb and flow line elevations on finished concrete or AC surfaces at key locations such as BC's, EC's, grade breaks, corners or angle points in sufficient number to demonstrate the Work complies with the intent of the Contract Documents.

H. Provide horizontal and vertical control for batter boards for drainage, utility, and other on-site structures as required.

I. Furnish building corner offsets as required to adequately locate building pads. Provide cut and fill stakes within the building pad perimeter adequate to control both over excavation and re-compaction and the final sub-grade elevation of the building pad.

J. Submit a certification, signed by the surveyor, confirming the elevations and locations of improvements are in conformance with the Contract Documents. The statement shall include survey notes for the finish floor and building pad, showing the actual measured elevations on the completed sub-grade, recorded to the nearest 0.01'. Building pad tolerance will be +- 0.10'.

3.04 ESTABLISHMENT OF GRADES IN HARDSCAPE AREAS

A. All work shall conform to the lines, elevations, and grades shown on the Grading Plans. Three consecutive points set on the same slope shall be used together so that any variation from a straight grade can be detected. Any such variation shall be reported to the Engineer. In the absence of such report, the Contractor shall be responsible for any error in the grade of the finished work.

B. Areas having drainage gradients of 2 percent or more shall have elevation stakes, set with instrument, at grid intervals of 25 feet. Intermediate stakes may be set by using a tightly-drawn string line over the tops of adjacent stakes. Grade stakes must be set at all grade breaks, grade changes, etc.

C. Areas having drainage gradients of less than 2 percent shall have elevation stakes, set with instrument, at 10 foot intervals. Grade stakes must be set at all grade breaks, grade changes, etc.

D. Protect and maintain stakes in place until their removal is approved by the Owner. Grade or location stakes lost or disturbed by Contractor, shall be reset by the Surveyor at the expense of Contractor.

3.05 STORM DRAIN & SEWER PIPE INSTALLATION

A. All storm drain & sewer pipelines, cleanouts, catch basins and drain inlets shall be staked by a licensed surveyor if slope of grade is less than 2% and a complete set of cut sheets shall be supplied to the Inspector. All construction staking shall be installed and verified for grade and alignment prior to the start of construction.

3.06 RECORD DRAWINGS

A. Upon Substantial Completion, CONTRACTOR shall obtain and pay for reproducible transparencies of the as built survey drawings. Deliver to ARCHITECT, final "record" drawings of the original drawings and completed Work within specified tolerances.

B. Record drawings shall indicate locations by coordinate of all utilities onsite with top of pipe elevations at major grade and alignment changes, rim grate or top-of-curb and flow line elevations of all drainage structures and manholes.

C. Completed record drawing transparencies shall be signed and certified as correct and within specified tolerances by the licensed surveyor.

D. Attention is called to other sections of the Contract Documents requiring verification or measurements of installed Work by survey. Surveyor shall perform and certify all such surveys or verification are completed in accordance with the Contract Documents.

END OF SECTION

SECTION 01 74 19
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 GENERAL

1.01 WASTE MANAGEMENT REQUIREMENTS

A. Comply with the requirements Section 5.408 of the California Green Building Standards Code.

1. Recycle and/or salvage for reuse a minimum of 65 percent of the nonhazardous construction and demolition waste in accordance with Section 504.8.1.1, 5.408.1.2, or 5.408.1.3; or meet a local construction and demolition waste management ordinance, whichever is more stringent.

B. District requires that this project generate the least amount of trash and waste possible.

C. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.

D. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.

E. Required Recycling, Salvage, and Reuse: The following may not be disposed of in landfills or by incineration:

1. Aluminum and plastic beverage containers.
2. Corrugated cardboard.
3. Wood pallets.
4. Clean dimensional wood.
5. Land clearing debris, including brush, branches, logs, and stumps; see Section 31 10 00 - Site Clearing for use options.
    a. Comply with California Green Code (CGC) 5.408.3; Excavated soil and land clearing debris: 100 percent of trees, stumps, rocks and associated vegetation and soils resulting primarily from land clearing shall be reused or recycled.
        1) Exception: Reuse, either on-or off-site, of vegetation or soil contaminated by disease or pest infestation.
6. Concrete: May be crushed and used as riprap, aggregate, sub-base material, or fill.
7. Bricks: May be used on project if whole, or crushed and used as landscape cover, sub-base material, or fill.
8. Concrete masonry units: May be used on project if whole, or crushed and used as sub-base material or fill.
9. Asphalt paving: May be recycled into paving for project.
10. Metals, including packaging banding, metal studs, sheet metal, structural steel, piping, reinforcing bars, door frames, and other items made of steel, iron, galvanized steel, stainless steel, aluminum, copper, zinc, lead, brass, and bronze.
11. Glass.

12. Gypsum drywall and plaster.
13. Carpet, carpet cushion, carpet tile, and carpet remnants, both new and removed: DuPont (http://flooring.dupont.com) and Interface (www.interfaceinc.com) conduct reclamation programs.
14. Roofing.
15. Paint.
16. Plastic sheeting.
17. Rigid foam insulation.
18. Windows, doors, and door hardware.
19. Plumbing fixtures.
20. Mechanical and electrical equipment.
21. Fluorescent lamps (light bulbs).
22. Acoustical ceiling tile and panels.
23. Materials which could be hazardous and subject to special disposal regulations include but are not limited to the following: CalGreen Section 5.408.2
    a. Lead-Based Paint
    b. Asbestos: Found in older pipe insulation, asphalt floor tiles, linoleum, insulation, etc.
    c. Polychlorinated Biphenyls (PCBs):
        1) Found in electrical oil filled equipment manufactured prior to 1978 such as transformers, switches and fluorescent lamp ballasts.
        2) Also found in adhesive, sealant, caulk, glazing putty, roofing material, pesticide vehicle, ink, paper, fabric dye, gaskets, and hydraulic fluid.
    d. HVAC Refrigerants: Containing Fluorinated and Chlorinated compounds.
    e. Drinking Fountain Refrigerants: Containing Fluorinated and Chlorinated compounds.
    f. Fluorescent Light Tubes: Contain mercury.
    g. EXIT signs and Smoke Detectors: May contain unregulated, radioactive tritium. · Required to be returned to manufacturer.
    h. Contaminated Soils.
    i. Pressure Treated Lumber.

F. Contractor Reporting Responsibilities: Submit periodic Waste Disposal Reports; report landfill disposal, recycling, salvage, and reuse regardless of to whom the cost or savings accrues; use the same units of measure on required reports.
    1. Contractor's quantitative reports for construction waste materials as a condition of approval of progress payments.

G. Contractor shall develop and follow a Waste Management Plan designed to implement these requirements. CalGreen Section 5.408.1.1.

H. The following sources may be useful in developing the Waste Management Plan:
    1. California Recycling Department, at www.dgs.ca.gov/BSC/CALGreen.

2. General information contacts regarding construction and demolition waste:
    a. Directory of Wood-Framed Building Deconstruction and Reused Building Materials Companies: www.fpl.fs.fed.us/documnts/fplgtr/fpl_gtr150.pdf.
    b. Additional resources to be developed by Contractor with assistance from District and **Contractor, as requested.**
3. Recycling Haulers and Markets: The source list below contains local haulers and markets for recyclable materials. This list is provided for information only and is not necessarily comprehensive; other haulers and markets are acceptable.
    a. CAL-MAX: www.calrecycle.ca.gov.
        1) A free service designed to help businesses find markets for non-hazardous materials they have traditionally discarded.
    b. General Recycling/Reuse Centers: For information on qualified local solid waste haulers contact the California Department of Resources Recycling and Recovery - CalRecycle. The website lists wastes recycling facilities in counties throughout the State of California.
4. Recycling Economics Information: The above lists contain information that may be useful in estimating the costs or savings or recycling options.

I. Methods of trash/waste disposal that are not acceptable are:
1. Burning on the project site.
2. Burying on the project site.
3. Dumping or burying on other property, public or private.
4. Other illegal dumping or burying.
5. Incineration, either on- or off-site.

J. Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, state and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

1.02 RELATED REQUIREMENTS

A. Section 01 10 00 - Summary: List of items to be salvaged from the existing building for relocation in project or for District.

B. Section 01 25 00 - Substitution Procedures.

C. Section 01 30 00 - Administrative Requirements: Additional requirements for project meetings, reports, submittal procedures, and project documentation.

D. Section 01 50 00 - Temporary Facilities and Controls: Additional requirements related to trash/waste collection and removal facilities and services.

E. Section 01 60 00 - Product Requirements: Waste prevention requirements related to product substitutions.

F. Section 01 60 00 - Product Requirements: Waste prevention requirements related to delivery, storage, and handling.

G. Section 01 70 00 - Execution and Closeout Requirements: Trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

H. Section 31 10 00 - Site Clearing: Handling and disposal of land clearing debris.

1.03 DEFINITIONS

A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.

B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.

1. Debris that is not hazardous as defined in CalGreen Section 5.408.2 and California Code of Regulations, Title 22, Section 66261.3 et seq.

2. This term includes, but is not limited to, asphalt concrete, Portland cement concrete, brick, lumber, gypsum wallboard, cardboard and other associated packaging, roofing material, ceramic tile, carpeting, plastic pipe, and steel.

3. The debris may be commingled with rock, soil, tree stumps, and other vegetative matter resulting from land clearing and landscaping for construction or land development projects.

C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.

D. Diversion: Avoidance of demolition and construction waste sent to landfill or incineration. Diversion does not include using materials for landfill, alternate daily cover on landfills, or materials used as fuel in waste-to-energy processes.

E. Enforcement Agency (EA). Enforcement agency as defined in CA Public Resources Code 40130.

F. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.

G. Landfill, Inert waste or Inert Disposal Facility:

1. A disposal facility that accepts only inert waste such as soil and rock, fully cured asphalt paving, uncontaminated concrete (including fiberglass or steel reinforcing rods embedded in the concrete), brick, glass, and ceramics, for land disposal.

H. Landfill, Class III:

1. A landfill that accepts non-hazardous resources such as household, commercial, and industrial waste, resulting from construction, remodeling, repair, and demolition operations.

2. A Class III landfill must have a solid waste facilities permit from the California Integrated Waste Management Board (CIWMB) and is regulated by the Enforcement Agency (EA).

I. Mixed Debris: Loads that include commingled recyclable and non-recyclable materials generated at the construction site.

J. Mixed Debris Recycling Facility: A processing facility that accepts loads of commingled construction and demolition debris for the purpose of recovering re-usable and recyclable materials and disposing the non-recyclable residual materials.

K. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.

L. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.

M. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.

N. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.

O. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

P. Recycling Center: A facility that receives only C&D material that has been separated for reuse prior to receipt, in which the residual (disposed) amount of waste in the material is less than 10% of the amount separated for reuse by weight.

Q. Return: To give back reusable items or unused products to vendors for credit.

R. Reuse: To reuse a construction waste material in some manner on the project site.

S. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.

T. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.

U. Separated for Reuse:

1. Materials, including commingled recyclables.
2. Separated or kept separate from the solid waste stream for the purpose of:
    a. Additional sorting or processing those materials for reuse or recycling.
        1) In order to return them to the economic mainstream in the form of raw material for new, reused, or reconstituted products.
    b. Products shall meet the quality standards necessary to be used in the marketplace.
    c. Includes materials that have been “source separated”.

V. Solid Waste:

1. All putrescible and nonputrescible solid, semisolid, and liquid wastes, including:
    a. Garbage, trash, refuse, paper, rubbish, ashes, industrial wastes, demolition and construction wastes.
    b. Abandoned vehicles and parts thereof.
    c. Discarded home and industrial appliances.
    d. Dewatered, treated, or chemically fixed sewage sludge which is not hazardous waste.
    e. Manure, vegetable or animal solid and semisolid wastes.
    f. Other discarded solid and semisolid wastes.

2. "Solid waste" does not include hazardous waste, radioactive waste, or medical waste as defined or regulated by State law.

W. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.

1. Materials, including commingled recyclables, that have been separated or kept separate from the solid waste stream at the point of generation, for the purpose of additional sorting or processing of those materials for reuse or recycling in order to return them to the economic mainstream in the form of raw materials for new, reused, or reconstituted products which meet the quality standards necessary to be used in the marketplace.

X. Toxic: Poisonous to humans either immediately or after a long period of exposure.

Y. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.

Z. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

AA. Waste Hauler: A company that possesses a valid permit from the local waste management authority to collect and transport solid wastes from individuals or businesses for the purpose of recycling or disposal in the locality.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Submit Waste Management Plan within 30 calendar days after receipt of Notice to Proceed, or prior to any trash or waste removal, whichever occurs sooner; submit projection of all trash and waste that will require disposal and alternatives to landfilling.

1. Submit four copies of CWMP for review.

a. Contractor's Construction Waste and Recycling Plan must be approved by the Architect and Construction Manager prior to the start of Work.

2. Approval of the Contractor's CWMP shall not relieve the Contractor of responsibility for adequate and continuing control of pollutants and other environmental protection measures.

C. Waste Disposal Reports: Submit at specified intervals, with details of quantities of trash and waste, means of disposal or reuse, and costs; show both totals to date and since last report.

1. Submit updated Report with each Application for Progress Payment; failure to submit Report will delay payment.

a. Inert materials shall achieve a construction waste diversion rate of at least 95 percent.

1) These materials include, but are not limited to, concrete, asphalt and rock.

2) Earthwork is not included.

3) Excavated soil shall not be included in any of the calculations used to ensure compliance with this specification section.

b. The overall diversion rate must be based on weight.

c. The diversion rate of individual materials can be measured in either weight or volume, but the rate shall be converted into the units selected for calculating the overall diversion rate.

1) All individual material diversions must be converted to a consistent set of units when calculating the overall diversion rate for the all reports and submittals required for the Work.

d. Base conversion rate numbers on standard conversion rate data for construction projects provided by the California Integrated Waste Management Board (CIWMB). This data is available at the following internet location, www.calrecycle.ca.gov/LGCentral/Library/Guidance.

2. Submit Report on a form acceptable to District.

3. Landfill Disposal: Include the following information:

a. Identification of material.

b. Amount, in tons or cubic yards, of trash/waste material from the project disposed of in landfills.

c. State the identity of landfills, total amount of tipping fees paid to landfill, and total disposal cost.

d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.

4. Recycled and Salvaged Materials: Include the following information for each:

a. Identification of material, including those retrieved by installer for use on other projects.

b. Amount, in tons or cubic yards, date removed from the project site, and receiving party.

c. Transportation cost, amount paid or received for the material, and the net total cost or savings of salvage or recycling each material.

d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.

e. Certification by receiving party that materials will not be disposed of in landfills or by incineration.

5. Material Reused on Project: Include the following information for each:

a. Identification of material and how it was used in the project.

b. Amount, in tons or cubic yards.

c. Include weight tickets as evidence of quantity.

6. Other Disposal Methods: Include information similar to that described above, as appropriate to disposal method.

PART 2 PRODUCTS

2.01 PRODUCT SUBSTITUTIONS

A. See Section 01 60 00 and Section 01 25 00.

B. For each proposed product substitution, submit the following information in addition to requirements specified in Section 01 60 00:

1. Relative amount of waste produced, compared to specified product.
2. Cost savings on waste disposal, compared to specified product, to be deducted from the Contract Sum.
3. Proposed disposal method for waste product.
4. Markets for recycled waste product.

PART 3 EXECUTION

3.01 WASTE MANAGEMENT PROCEDURES

A. See Section 01 30 00 for additional requirements for project meetings, reports, submittal procedures, and project documentation.

B. See Section 01 50 00 for additional requirements related to trash/waste collection and removal facilities and services.

C. See Section 01 60 00 for waste prevention requirements related to delivery, storage, and handling.

D. See Section 01 70 00 for trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

3.02 WASTE MANAGEMENT PLAN IMPLEMENTATION

A. Manager: Designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.

B. Communication: Distribute copies of the Waste Management Plan to job site foreman, each subcontractor, District, and Architect.

C. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.

D. Meetings: Discuss trash/waste management goals and issues at project meetings.

1. Prebid meeting.
2. Preconstruction meeting.
3. Regular job-site meetings.

E. Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all contractors and installers.

1. As a minimum, provide:
    a. Separate area for storage of materials to be reused on-site, such as wood cut-offs for blocking.

b. Separate dumpsters for each category of recyclable.

c. Recycling bins at worker lunch area.

2. Provide containers as required.

3. Provide temporary enclosures around piles of separated materials to be recycled or salvaged.

4. Provide materials for barriers and enclosures that are nonhazardous, recyclable, or reusable to the maximum extent possible; reuse project construction waste materials if possible.

5. Locate enclosures out of the way of construction traffic.

6. Provide adequate space for pick-up and delivery and convenience to subcontractors.

7. If an enclosed area is not provided, clearly lay out and label a specific area on-site.

8. Keep recycling and trash/waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.

F. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.

G. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of materials and to maximize recyclability of identified materials. Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.

H. Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.

I. Salvage: Set aside, sort, and protect products to be salvaged for reuse off-site.

3.03 DISPOSAL OPERATIONS AND WASTE HAULING

A. Remove waste materials from Project Site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

1. Except for items or materials to be salvaged, recycled, or otherwise reused.

2. Except as otherwise specified, do not allow waste materials that are to be disposed of to accumulate on site.

3. Use a permitted waste hauler or Contractor's trucking services and personnel. To confirm valid permitted status of waste haulers, contact the local solid waste authority.

4. Become familiar with the conditions for acceptance of new construction, excavation and demolition materials at recycling facilities, prior to delivering materials.

5. Deliver to facilities that can legally accept new construction, excavation and demolition materials for purpose of re-use, recycling, composting, or disposal.

6. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

7. Do not burn or bury waste materials on or off site. Appropriate on-site topical application of ground gypsum or wood, or use of site paving as granulated fill is considered reuse, not waste.

3.04 PLAN AND REPORT FORMS

A. See suggested forms on the following pages.

END OF SECTION

CONTRACTOR'S CONSTRUCTION WASTE AND RECYCLING PLAN

(Submit After Award of Contract and Prior to Start of Work)

Project Title:			
Contract or Work Order No.:			
Contractor's Name:			
Street Address:			
City:		State:	Zip:
Phone: ( )		Fax: ( )	
E-Mail Address:			
Prepared by: (Print Name)			

Date Submitted:			
Project Period:		From:	TO:

Reuse, Recycling or Disposal Processes To Be Used

Describe the types of recycling processes or disposal activities that will be used for material generated in the project. Indicate the type of process or activity by number, types of materials, and estimated quantities that will be recycled or disposed in the sections below:

01 - Reuse of building materials or salvage items on site (i.e. crushed base or red clay brick)
02 - Salvaging building materials or salvage items at an offsite salvage or re-use center (i.e. lighting, fixtures)
03 - Recycling source separated materials on site (i.e. crushing asphalt/concrete for reuse or grinding for mulch)
04 - Recycling source separated materials at an offsite recycling center (i.e. scrap metal or green materials)
05 - Recycling commingled loads of C&D materials at an offsite mixed debris recycling center or transfer station
06 - Recycling material as Alternative Daily Cover at landfills
07 - Delivery of soils or mixed inerts to an inert landfill for disposal (inert fill).
08 - Disposal at a landfill or transfer station.
09 - Other (please describe) _____

Types of Material To Be Generated

Use these codes to indicate the types of material that will be generated on the project

A = Asphalt	C = Concrete	M = Metals	I = Mixed Inert	G = Green Materials
D = Drywall	P/C=Paper/Cardboard	W/C = Wire/Cable	S= Soils (Non Hazardous)	
M/C = Miscellaneous Construction Debris		R = Reuse/Salvage	W = Wood	O = Other (describe)

Facilities Used: Provide Name of Facility and Location (City)
Total Truck Loads: Provide Number of Trucks Hauled from Site During Reporting Period
Total Quantities: If scales are available at sites, report in tons. If not, quantify by cubic yards. For salvage/reuse items, quantify by estimated weight (or units).

SECTION I - RE-USED/RECYCLED MATERIALS

Include all recycling activities for source separated or mixed material recycling centers where recycling will occur.

Type of Material	Type of Activity	Facility to be Used/Location	Total Truck Loads	Total Quantities		
				Tons	Cubic YD	Other Wt.
(ex.) M	04	ABC Metals, Los Angeles	24	355		
a. Total Diversion						

CONTRACTOR'S CONSTRUCTION WASTE AND RECYCLING PLAN

Continued

SECTION II - DISPOSED MATERIALS						
Include all disposal activities for landfills, transfer stations, or inert landfills where no recycling will occur.						
				Total Quantities		
Type of Material	Type of Activity	Facility to be Used/Location	Total Truck Loads	Tons	Cubic YD	Other Wt.
(ex.) D	08	DEF Landfill, Los Angeles	2	35		
b. Total Disposal				0	0	0

SECTION III - TOTAL MATERIALS GENERATED			
This section calculates the total materials to be generated during the project period (Reuse/Recycle + Disposal = Generation			
	Tons	Cubic YD	Other Wt.
a. Total Reused/Recycled	0	0	0
b. Total Disposed	0	0	0
c. Total Generated	0	0	0

SECTION IV - CONTRACTOR'S LANDFILL DIVERSION RATE CALCULATION			
Add totals from Section I + Section II			
	Tons	Cubic YD	Other Wt.
a. Materials Re-Used and Recycled	0		
b. Materials Disposed	0		
c. Total Materials Generated (a. + b. = c.)	0	0	0
d. Landfill Diversion Rate (Tonnage Only)*			

* Use tons only to calculate recycling percentages: Tons Reused/Recycled/Tons Generated = % Recycled

Contractor's Comments (Provide any additional information pertinent to planned reuse, recycling, or disposal activities):

Notes:

1. Suggested Conversion Factors: From Cubic Yards to Tons (Use when scales are not available)
   a. Asphalt: .61 (ex. 1000 CY Asphalt = 610 tons. Applies to broken chunks of asphalt)
   b. Concrete: .93 (ex. 1000 CY Concrete = 930 tons. Applies to broken chunks of concrete)
   c. Ferrous Metals: .22 (ex. 1000 CY Ferrous Metal = 220 tons)
   d. Non-Ferrous Metals: .10 (ex. 1000 CY Non-Ferrous Metals = 100 tons)
   e. Drywall Scrap: .20
   f. Wood Scrap: .16

CONTRACTOR'S REUSE, RECYCLING, AND DISPOSAL REPORT

(Submit With Each Progress Payment)

Project Title:			
Contract or Work Order No.:			
Contractor's Name:			
Street Address:			
City:		State:	Zip:
Phone: ( )		Fax: ( )	
E-Mail Address:			
Prepared by: (Print Name)			

Date Submitted:			
Project Period:		From:	TO:

Reuse, Recycling or Disposal Processes to Be Used

Describe the types of recycling processes or disposal activities that will be used for material generated in the project. Indicate the type of process or activity by number, types of materials, and estimated quantities that will be recycled or disposed in the sections below:

01 - Reuse of building materials or salvage items on site (i.e. crushed base or red clay brick)
02 - Salvaging building materials or salvage items at an offsite salvage or re-use center (i.e. lighting, fixtures)
03 - Recycling source separated materials on site (i.e. crushing asphalt/concrete for reuse or grinding for mulch)
04 - Recycling source separated materials at an offsite recycling center (i.e. scrap metal or green materials)
05 - Recycling commingled loads of C&D materials at an offsite mixed debris recycling center or transfer station
06 - Recycling material as Alternative Daily Cover at landfills
07 - Delivery of soils or mixed inerts to an inert landfill for disposal (inert fill).
08 - Disposal at a landfill or transfer station.
09 - Other (please describe) _____

Types of Material To Be Generated

Use these codes to indicate the types of material that will be generated on the project

A = Asphalt	C = Concrete	M = Metals	I = Mixed Inert	G = Green Materials
D = Drywall	P/C=Paper/Cardboard	W/C = Wire/Cable	S= Soils (Non-Hazardous)	
M/C = Miscellaneous Construction Debris		R = Reuse/Salvage	W = Wood	O = Other (describe)

Facilities Used: Provide Name of Facility and Location (City)
Total Truck Loads: Provide Number of Trucks Hauled from Site During Reporting Period

Total Quantities: If scales are available at sites, report in tons. If not, quantify by cubic yards. For salvage/reuse items, quantify by estimated weight (or units).

SECTION I - RE-USED/RECYCLED MATERIALS

Include all recycling activities for source separated or mixed material recycling centers where recycling will occur.

Type of Material	Type of Activity	Facility to be Used/Location	Total Truck Loads	Total Quantities		
				Tons	Cubic YD	Other Wt.
(ex.) M	04	ABC Metals, Los Angeles	24	355		
a. Total Diversion						

CONTRACTOR'S REUSE, RECYCLING, AND DISPOSAL REPORT

Continued

SECTION II - DISPOSED MATERIALS						
Include all disposal activities for landfills, transfer stations, or inert landfills where no recycling will occur.						
Type of Material	Type of Activity	Facility to be Used/Location	Total Truck Loads	Total Quantities		
				Tons	Cubic YD	Other Wt.
(ex.) D	08	DEF Landfill, Los Angeles	2	35		
b. Total Disposal						

SECTION III - TOTAL MATERIALS GENERATED			
This section calculates the total materials to be generated during the project period (Reuse/Recycle + Disposal = Generation			
	Tons	Cubic YD	Other Wt.
a. Total Reused/Recycled			
b. Total Disposed			
c. Total Generated			

SECTION IV - CONTRACTOR'S LANDFILL DIVERSION RATE CALCULATION			
Add totals from Section I + Section II			
	Tons	Cubic YD	Other Wt.
a. Materials Re-Used and Recycled			
b. Materials Disposed			
c. Total Materials Generated (a. + b. = c.)			
d. Landfill Diversion Rate (Tonnage Only)*			

* Use tons only to calculate recycling percentages: Tons Reused/Recycled/Tons Generated = % Recycled

Contractor's Comments (Provide any additional information pertinent to planned reuse, recycling, or disposal activities):

Notes:

1. Suggested Conversion Factors: From Cubic Yards to Tons (Use when scales are not available)
   a. Asphalt: .61 (ex. 1000 CY Asphalt = 610 tons. Applies to broken chunks of asphalt)
   b. Concrete: .93 (ex. 1000 CY Concrete = 930 tons. Applies to broken chunks of concrete)
   c. Ferrous Metals: .22 (ex. 1000 CY Ferrous Metal = 220 tons)
   d. Non-Ferrous Metals: .10 (ex. 1000 CY Non-Ferrous Metals = 100 tons)
   e. Drywall Scrap: .20
   f. Wood Scrap: .16

SECTION 01 78 00
CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Project record documents.

B. Operation and maintenance data.

C. Warranties and bonds.

1.02 RELATED REQUIREMENTS

A. The provisions in this Division 01 Section are subject to the provisions of all Division 00 Documents, including the Contract Agreement, General Conditions, and cannot contradict (but can supplement) Division 00 Documents.

B. District issued Bidding Instructions and Contract General Conditions: Performance bond and labor and material payment bonds, warranty, and correction of work.

C. Section 01 30 00 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.

D. Section 01 45 33 - Code-Required Special Inspections and Procedures: Construction oversight procedures by DSA regarding the execution, approval, and closeout of this building project.

E. Section 01 70 00 - Execution and Closeout Requirements: Contract closeout procedures.

F. Section 01 78 39 - Project Record Documents: Detailed requirements.

G. Individual Product Sections: Specific requirements for operation and maintenance data.

H. Individual Product Sections: Warranties required for specific products or Work.

1. Special Project warranty requirements for specific products or elements of the Work; commitments and agreements for continuing services to District.

1.03 DEFINITIONS

A. Warranty: Assurance to District by Contractor, installer, supplier, manufacturer or other party responsible as warrantor, for the quantity, quality, performance and other representations of a product, system service of the Work, in whole or in part, for the duration of the specified period of time.

B. Guarantee: Assurance to District by Contractor or product manufacturer or other specified party, as guarantor, that the specified warranty will be fulfilled by the guarantor in the event of default by the warrantor.

C. Standard Product Warranty: Preprinted, written warranty published by product manufacturer for particular products and specifically endorsed by the manufacturer to the District.

D. Special Project Warranty: Written warranty required by or incorporated into Contract Documents, to extend time limits provided by standard warranty or to provide greater rights for District.

E. Correction Period: As defined in the Conditions of the Contract, Correction Period shall be synonymous with "warranty period", "guarantee period" and similar terms used in the Contract Specifications.

1.04 SUBMITTALS

A. Advance Submittals: For equipment and systems, or component parts of systems, put into service during construction and operated by District, submit documents within ten days of start of operation by District.

B. Final Completion Submittals: Prior to application for final payment, Contractor shall submit 3 copies the following:

1. Agency Document Submittals: Submit to District all documents required by authorities having jurisdiction, including serving utilities and other agencies. Submit original versions of all permit cards, with final sign-off by inspectors. Submit all certifications of inspections and tests.

a. Complete all required Contractor forms and obtain DSA approval of these same forms. Comply with “Final Certification of Construction” per Title 24 Part 1 section 4-339.

1) Form-6.C: Verified Report – Contractor: From each Contractor having a contract with the District.

2. Final Specifications Submittals: Submit to District all documents and products required by Specifications to be submitted, including the following:

a. Project record drawings and specifications.

b. Operating and maintenance data.

c. Guarantees, warranties and bonds.

d. Keys and keying schedule.

e. Spare parts and extra stock.

f. Test reports and certificates of compliance.

3. Certificates of Compliance and Test Report Submittals: Submit to District certificates and reports as specified and as required by authorities having jurisdiction, including the following:

a. Sterilization of water systems.

b. Sanitary sewer system tests.

c. Gas system tests.

d. Lighting, power and signal system tests.

e. Ventilation equipment and air balance tests.

f. Fire sprinkler system tests.

g. Fire detection system, smoke alarms and dampers.

h. Roofing inspections and tests.

4. Lien and Bonding Company Releases: Submit to District, with copy to Architect, evidence of satisfaction of encumbrances on Project by completion and submission of The American Institute of Architects Forms:

a. G706 - Contractor's Affidavit of Payment of Debts and Claims;

b. G706A - Contractor's Affidavit of Release of Liens;

c. (if applicable) G707 - Consent of Surety;

d. or forms as as agreed to by the District.

e. Comply also with other requirements of District, as directed.

f. All signatures shall be notarized.

5. Subcontractor List: Submit to two copies to District and two copies to Architect of updated Subcontractor and Materials Supplier List.

6. Warranty Documents: Prepare and submit to District all warranties and bonds as specified in Contract General Conditions and this Section.

C. Project Record Documents: Submit final progress markup PDF documents by uploading via Bluebeam to Architect with claim for final Application for Payment.

D. Operation and Maintenance Data:

1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return one copy with comments.

2. For equipment, or component parts of equipment put into service during construction and operated by District, submit completed documents within ten days after acceptance.

3. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Architect comments. Revise content of all document sets as required prior to final submission.

4. Submit two sets of revised final documents in final form within 10 days after final inspection.

E. Warranties and Bonds:

1. For equipment or component parts of equipment put into service during construction with District's permission, submit documents within 10 days after acceptance.

2. Make other submittals within 10 days after Date of Final Inspection, prior to final Application for Payment.

3. For items of Work for which acceptance is delayed beyond Date of Final Inspection, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

A. See also Section 01 78 39 - Project Record Documents.

B. Record Documents are to be maintained and submitted in searchable live electronic format (PDF), unflattened.

1. Develop in compliance with Section 01 30 00 - Administrative Requirements.

2. Acceptable markup software:

a. Adobe Acrobat Professional.

b. Bluebeam Revu.

C. Maintain on site one set of the following record documents; record actual revisions to the Work:
   1. Contract Drawings.
   2. Project Manual with Specifications.
   3. Addenda.
   4. Change Orders and other modifications to the Contract.
   5. Reviewed shop drawings, product data, and samples.
   6. Manufacturer's instruction for assembly, installation, and adjusting.

D. Ensure entries are complete and accurate, enabling future reference by District.

E. Store record documents separate from documents used for construction.

F. Record information concurrent with construction progress.

G. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
   1. Manufacturer's name and product model and number.
   2. Product substitutions or alternates utilized.
   3. Changes made by Addenda and modifications.
   4. Provide copies of all approved addenda, directives, corrections, and change orders affecting the associated project.
      a. These copies shall be included with the "Bid Set" and/or "Record Set" listed above and formatted as detailed above.

H. Record Drawingsand Shop Drawings: Legibly mark each item to record actual construction including:
   1. Reproducible (PDF) set of Contract Drawings will be provided to Contractor by District through Architect or Owner Representative.
   2. Measured depths of foundations in relation to finish first floor datum.
   3. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
   4. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
   5. Field changes of dimension and detail.
   6. Details not on original Contract drawings.
      a. Application of copies of details produced and provided by Architect during construction will be accepted.
   7. Sketches, clarifications (RFI's), Field Orders, Supplemental Instructions, Construction Change Documents, and Approved Change Orders

I. Submission: Submit by uploading, Record Documents to Architect prior to each Application for Payment.

1. Provide, by email, to the Architect, a download link the Record Documents consisting of an unflattened PDF format with live text and redline mark-ups, not scanned.
2. Maintain one additional paper copy and one in PDF format (on CD) of the fire suppression and fire protection detection system drawings and specifications at the building premises.
    a. One copy is to be kept on site for a period of three years to comply with CFC section 901.6.2.

3.02 OPERATION AND MAINTENANCE DATA

A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.

B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.

D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

A. For Each Product, Applied Material, and Finish:
    1. Product data, with catalog number, size, composition, and color and texture designations.
    2. Information for re-ordering custom manufactured products.

B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.

C. Moisture protection and weather-exposed products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.

D. Additional information as specified in individual product specification sections.

E. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

A. For Each Item of Equipment and Each System:
    1. Description of unit or system, and component parts.
    2. Identify function, normal operating characteristics, and limiting conditions.
    3. Include performance curves, with engineering data and tests.
    4. Complete nomenclature and model number of replaceable parts.

B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

C. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; by label machine.

D. Include color coded wiring diagrams as installed.

E. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

F. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

1. Include HVAC outdoor and exhaust air damper calibration strategy.
    a. Include provisions which ensure that full closure of dampers can be achieved.
2. Include Carbon Dioxide Monitoring Protocol.

G. Provide servicing and lubrication schedule, and list of lubricants required.

H. Include manufacturer's printed operation and maintenance instructions.

I. Include sequence of operation by controls manufacturer.

J. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

K. Provide control diagrams by controls manufacturer as installed.

L. Provide Contractor's coordination drawings, with color coded piping diagrams as installed.

M. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

N. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

1. Parts Data:
    a. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams as necessary for service and maintenance.
    b. Include complete nomenclature and catalog numbers for consumable and replacement parts.
    c. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in stock by the District or operator.

O. Include test and balancing reports.

P. Additional Requirements: As specified in individual product specification sections.

3.05 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

A. Assemble operation and maintenance data into durable manuals for District's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.

1. Provide duplicate electronic formatted (PDF) versions of the O&M binder for record purposes. Organize the same as the printed versions.

B. Where systems involve more than one specification section, provide separate tabbed divider for each system.

C. Binders: Commercial quality, 8-1/2 by 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.

D. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.

E. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Architect, Consultants, Contractor and subcontractors, with names of responsible parties.

F. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.

G. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.

H. Text: Manufacturer's printed data, or typewritten data on 20 pound paper.

I. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

J. Arrangement of Contents: Organize each volume in parts as follows:

1. Project Directory.
2. Table of Contents, of all volumes, and of this volume.
3. Operation and Maintenance Data: Arranged by system, then by product category.
    a. Source data.
    b. Product data, shop drawings, and other submittals.
    c. Operation and maintenance data.
    d. Field quality control data.
    e. Photocopies of warranties and bonds.
4. Design Data: To allow for addition of design data furnished by Architect or others, provide a tab labeled "Design Data" and provide a binder large enough to allow for insertion of at least 20 pages of typed text.

3.06 WARRANTIES AND BONDS

A. General:

1. Provide all warranties and guarantees with District named as beneficiary.
2. For equipment and products, or components thereof, bearing a manufacturer's warranty or guarantee that extends for a period of time beyond the Contractor's warranty and guarantee, so state in the warranty or guarantee.

B. General Warranty and Guarantee Requirements:

1. Warranty shall be an agreement to repair or replace, without cost and undue hardship to District, Work performed under the Contract which is found to be defective during the Correction Period (warranty or guarantee) period.
2. Repairs and replacements due to improper maintenance or operation, or due to normal wear, usage and weathering are excluded from warranty requirements unless otherwise specified.

C. Provisions for Special Warranties: Refer to Conditions of the Contract for terms of the Contractor's special warranty of workmanship and materials.

D. Specific Warranty and Guarantee Requirements: Specific requirements are included in product Specifications Technical Sections, including content and limitations.

E. Disclaimers and Limitations:
1. Manufacturer's disclaimers and limitations on product warranties and guarantees shall not relieve Contractor of responsibility for warranty and guarantee requirements.
2. This applies to the Work that incorporates such products, nor shall they relieve suppliers, manufacturers, and installers required to countersign special warranties with Contractor.

F. Related Damages and Losses: When correcting warranted Work that has been found defective, remove and replace other Work that has been damaged as a result of such defect or that must be removed and replaced to provide access for correction of warranted Work.

G. Reinstatement of Warranty:
1. When Work covered by a warranty has been found defective and has been corrected by replacement or rebuilding, reinstate the warranty by written endorsement.
2. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.

H. Replacement Cost:
1. Upon determination that Work covered by a warranty has been found to be defective, replace or reconstruct the Work to a condition acceptable to District, complying with applicable requirements of the Contract Documents.
2. Contractor is responsible for all costs for replacing or reconstructing defective Work regardless of whether District has benefited from use of the Work through a portion of its anticipated useful service life.

I. District's Recourse:
1. Written warranties made to the District are in addition to implied warranties, and do not limit the duties, obligations, rights and remedies otherwise available under law, nor shall warranty periods be interpreted as limitations on time in which the District can enforce such other duties, obligations, rights, or remedies.
2. Rejection of Warranties:
    a. The District reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.

J. Warranty as Condition of Acceptance:

1. District reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment shall be required on such Work or part of the Work, until evidence is presented that entities required to countersign such commitments are willing to do so.

K. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with District's permission, leave date of beginning of time of warranty until Date of Final Acceptance is determined.

L. Project Warranty and Guarantee Forms:

1. Example forms for special Project warranties and guarantees are included at the end of this Section.
2. Prepare written documents utilizing the appropriate form, ready for execution by the Contractor, or the Contractor and subcontractor, supplier or manufacturer.
    a. Submit a draft to District through Architect for approval prior to final execution.
3. Refer to product Technical Specifications Sections for specific content requirements, and particular requirements for submittal of special warranties.
4. Prepare standard warranties and guarantees, excepting manufacturers' standard printed warranties and guarantees, on Contractor's, subcontractor's, material supplier's, or manufacturer's own letterhead, addressed to District.
5. Warranty and guarantee letters shall be signed by all responsible parties and by Contractor in every case, with modifications only as approved in advance by District to suit the conditions pertaining to the warranty or guarantee.

M. Manufacturer's Guarantee Form:

1. Manufacturer's guarantee form may be used in lieu of special Project form included at the end of this Section.
2. Manufacturer's guarantee form shall contain appropriate terms and identification, ready for execution by the required parties.
3. If proposed terms and conditions restrict guarantee coverage or require actions by District beyond those specified, submit draft of guarantee to District through Architect for review and acceptance before performance of the Work.
4. In other cases, submit draft of guarantee to District through Architect for approval prior to final execution of guarantee.

N. Verify that documents are in proper form, contain full information, and are notarized.

1. Provide all warranties and guarantees with District named as beneficiary.
2. Signatures: By person authorized to sign warranties, guarantees and bonds on behalf of entity providing such warranty, guarantee or bond.
3. Co-Signature: All installer's warranties and bonds shall be co-signed by Contractor. Manufacturer's guarantees will not require co-signature.

O. Co-execute submittals when required.

P. Retain warranties and bonds until time specified for submittal.

Q. Manual: Bind in commercial quality 8-1/2 by 11 inch three D side ring binders with durable plastic covers.

R. Cover: Identify each binder with typed or printed title WARRANTIES AND BONDS, with title of Project; name, address and telephone number of Contractor and equipment supplier; and name of responsible company principal.

1. If more than one volume of warranties, guarantees and bonds is produced, identify volume number on binder.

S. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of product or work item.

T. Separate each warranty or bond with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

U. Form of Warranty and Bond Submittals:

1. Prior to final Application and Certificate for Payment, compile two copies of each required warranty, guarantee and bond, properly executed by Contractor, or jointly by Contractor, subcontractor, supplier, or manufacturer.
2. Collect and assemble all written warranties and guarantees into binders and deliver binders to District for final review and acceptance.
3. Include Table of Contents for binder, neatly typed, following order and Section numbers and titles as used in the Project Manual.
4. Provide heavy paper dividers with celluloid or plastic covered tabs for each separate warranty.
    a. Mark tabs to identify products or installation, and Section number and title.
5. Include on separate typed sheet, if information is not contained in warranty or guarantee form, a description of the product or installation, and the name, address, telephone number and responsible person for applicable installer, supplier and manufacturer.
6. When operating and maintenance data manuals are required for warranted construction, include additional copies of each required warranty and guarantee in each required manual.
    a. Coordinate with requirements listed in the prior articles for operating and maintenance data manuals.

3.07 TIME OF WARRANTY AND BOND SUBMITTALS

A. Submission of Preliminary Copies:

1. Unless otherwise specified, obtain preliminary copies of warranties, guarantees and bonds within ten days of completion of applicable item or Work.
2. Prepare and submit preliminary copies for review as specified herein.

B. Submission of Final Copies:

1. Submit fully executed copies of warranties, guarantees and bonds within ten days of date identified in Certificate of Completion but no later than three days prior to date of final Application for Payment.

C. Date of Warranties and Bonds:

1. Unless otherwise directed or specified, commencement date of warranty, guarantee and bond periods shall be the date established in the Certificate of Completion.
2. Warranties for Work accepted in advance of date stated in Certificate of Completion:
    a. When a designated system, equipment, component parts or other portion of the Work is completed and occupied or put to beneficial use by District:
        1) By separate agreement with Contractor, prior to completion date established in the Certificate of Completion, submit properly executed warranties to District within ten days of completion of that designated portion of the Work.
        2) List date of commencement of warranty, guarantee or bond period as the date established in the Certificate of Completion.
3. Warranties for Work not accepted as of date established in the Certificate of Completion:
    a. Submit documents within ten days after acceptance, listing date of acceptance as beginning of warranty, guarantee or bond period.

D. Duration of Warranties and Guarantees:

1. Unless otherwise specified or prescribed by law, warranty and guarantee periods shall be not less than the Correction Period required by the Conditions of the Contract.
2. In no case, the period is to be less than one year from the date established for completion of the Project in the Certificate of Completion.
3. See product Specifications Sections of the Project Manual for extended warranty and guarantee beyond the minimum one year duration.

END OF SECTION

SECTION 01 78 00.01
WARRANTY FORM LETTER

FOR CONTRACTOR'S / SUBCONTRACTOR'S / MANUFACTURER'S WARRANTY

CONTRACTOR'S/SUBCONTRACTOR'S/SUPPLIER'S LETTERHEAD

SPECIAL LIMITED PROJECT WARRANTY FOR _____ WORK.

We, the undersigned, do hereby warrant that the portion of the Work described above which we have provided for William Collier ES Shade Structure and Playground Improvements is in accordance with the Contract Documents and that all such Work as installed will fulfill or exceed all minimum warranty requirements. We agree to repair or replace Work installed by us, together with any adjacent Work which is displaced or damaged by so doing, that proves to be defective in workmanship, material, or function within a period of (years), commencing (date identified in Certificate of Completion, unless otherwise directed) and terminating (date).

The following terms and conditions apply to this warranty (obtain District 's approval before submission):

In the event of our failure to comply with the above-mentioned conditions within a reasonable time period determined by the District , after notification in writing, we, the undersigned, all collectively and separately, hereby authorize the District to have said defective Work repaired or replaced to be made good, and agree to pay to the District upon demand all moneys that the District may expend in making good said defective Work, including all collection costs and reasonable attorney fees.

LOCAL REPRESENTATIVE: FOR WARRANTY MAINTENANCE, REPAIR, OR REPLACEMENT SERVICE, CONTACT:

(Name) _____

(Address) _____

(City) _____ (State) _____ (ZIP) _____

(Phone) _____ / _____

(signed) _____

(Typed Name) _____ (Date) _____

(Title) _____ (Firm) _____

CONTRACTOR:

State License No: _____

(signed) _____

(Date) _____ (Typed Name) _____

(Title) _____ (Firm) _____

FORM LETTER

FOR CONTRACTOR'S / MANUFACTURER'S GUARANTEE

CONTRACTOR'S / MANUFACTURER'S LETTERHEAD

SPECIAL LIMITED PROJECT [__WARRANTY__] [__GUARANTEE__] FOR _____ WORK.

We, the undersigned, do hereby [__warrant__] [__guarantee__] that the portion of the Work described above which [__we have provided__] [__was provided by (Installer or Subcontractor's Name)__] for William Collier ES Shade Structure and Playground Improvements in accordance with the Contract Documents and that all such Work as installed will fulfill or exceed all minimum warranty requirements. We agree to repair or replace Work installed by [__us,__] [__(Installer or Subcontractor's Name)__] together with any adjacent Work which is displaced or damaged by so doing, that proves to be defective in workmanship, material, or function within a period of (years), commencing (date indicated in Certificate of Completion, unless otherwise directed) and terminating (date).

The following terms and conditions apply to this [__warranty__] [__guarantee__] (obtain District's approval before submission):

In the event of our failure to comply with the above-mentioned conditions within a reasonable time period determined by the District, after notification in writing, we, the undersigned, all collectively and separately, hereby authorize the District to have said defective Work repaired or replaced to be made good, and agree to pay to the District upon demand all moneys that the District may expend in making good said defective Work, including all collection costs and reasonable attorney fees.

LOCAL REPRESENTATIVE: FOR WARRANTY MAINTENANCE, REPAIR, OR REPLACEMENT SERVICE, CONTACT:

(Name) _____

(Address) _____

(City) _____ (State) _____ (ZIP) _____

(Phone) _____ / _____

(signed) _____

(Date) _____ (Typed Name) _____

(Title) _____ (Firm) _____

CONTRACTOR:

State License No: _____

(signed) _____

(Date) _____ (Typed Name) _____

(Title) _____ (Firm) _____

FORM LETTER

SECTION 01 78 39
PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.01 SUMMARY

A. Record Drawings.

B. Record Specifications.

C. Record Product Data.

D. Record Samples.

E. Record Photos and Video.

F. Miscellaneous record submittals.

G. Purpose:

1. The intent of this section is to establish standardized requirements for the collection, organization, and turnover of all project records in a digital format suitable for long-term District reference, maintenance, audits, DSA compliance, and future modernization projects.

1.02 RELATED REQUIREMENTS

A. The provisions in this Division 01 Section are subject to the provisions of all Division 00 Documents, including the Contract Agreement, General Conditions, and cannot contradict (but can supplement) Division 00 Documents.

B. Section 01 20 00 - Price and Payment Procedures: Schedule of Values.

C. Section 01 30 00 - Administrative Requirements: Project Coordination.

D. Section 01 78 00 - Closeout Submittals: General Closeout.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Project Record Documents: Recorded actual locations.

C. Digital Platform and Media:

1. Provide a dedicated digital surface (tablet):

a. Compile all project records, stored, and delivered on a dedicated digital surface (tablet device) provided at project closeout.

b. Device to become District property .

c. Minimum device requirements:

1) Tablet format (iPad or District-approved equivalent). Current 2026 examples:

(a) iPad Pro 13-inch (M5): Ultra Retina XDR Display, 256GB, Landscape 12MP Front Camera/12MP Back Camera, LiDAR Scanner, Wi-Fi 7 with Apple N1.

(b) Samsung Galaxy Tab S11 Ultra Ai Wifi Model, 14.6" 11600 mAh 13MP SM-X930 Dual Camera with S Pen.

(c) Microsoft Surface Pro 2-in-1 Laptop/Tablet (2024), Windows 11 Copilot+ PC, 13" Touchscreen OLED Display, Snapdragon X Elite (12 Core), 16GB RAM, 256GB Storage.

(d) Tablet manufactured within the last three (3) years prior to Final Inspection and delivery.

(e) Currently supported operating system at time of delivery. Latest version minus one (-1).

(1) Apple iPadOS.

(2) Android OS.

(3) Windows tablet OS.

2) Minimum Screen Size: 13 inches.

3) Minimum 256 GB storage.

4) Wi-Fi supported, IEEE 802.11.

5) Compatible with District document management systems.

6) Mobile phones, laptops, USB drives, external hard drives, or cloud-only submissions will not be accepted as substitutes.

d. Device shall be reset to factory condition prior to delivery.

e. Reset the device to factory condition prior to loading Project data. Deliver to the District with all Project files fully uploaded, organized, indexed, and ready for immediate use.

f. Device shall include:

1) Charging cable and power adapter.

2) Protective case: Clearly embossed or engraved plate with Project Name, Site, and DSA Application Number(s). Hand written paper label is not acceptable.

2. Required Digital Content: All files shall be clearly labeled, indexed, and organized into logical folders. No scanned PDFs of poor quality will be accepted.

a. Regulatory and Contract Documents:

1) DSA Approved Drawings (Final, stamped).

2) DSA Approved Project Manual (Specifications).

3) DSA Approved Addenda.

4) Construction Change Directives (CCDs).

5) Change Order Requests (CORs).

6) Approved Change Orders.

7) Record Documents (As-Built Drawings).

8) Deferred Approval documentation.

9) Field Memos (suplemental instructions not affecting DSA)

10) Inspector of Record (IOR) reports.

11) DSA Closeout Certification Documents.

b. Project Administration:

1) RFIs (submitted, responded, and closed).

2) Submittals (including rejected and resubmitted items).

3) Meeting minutes (OAC, Pre-construction, Closeout).

4) Approved schedules and schedule updates.

5) Daily reports.

6) Testing and inspection reports.

7) Special inspection reportsCommissioning reports (if applicable)

8) Commissioning reports (if applicable).

D. Visual Documentation:

1. Photography:

a. Progress photos (minimum monthly).

b. Concealed conditions (before cover).

c. Underground utilities.

d. Structural components.

e. MEP rough-in.

f. Final installed conditions

g. Photograph Requirements:

1) Dated.

2) Labeled by building/area.

3) Minimum resolution: 12 MP.

2. Video Documentation:

a. Site walk-through videos at:

1) Rough-in.

2) Final Inspection.

3) Final Completion.

4) Narrated where possible.

3. Aerial / Drone Imagery:

a. Where permitted by law and District policy:

1) Aerial photos and/or video capturing:Overall site layoutRoof systemsHardscape and utilitiesFiles shall include date, altitude, and direction of view

(a) Overall site layout.

(b) Roof systems.

(c) Hardscape and utilities.

(d) Files shall include date, altitude, and direction of view.

E. File Format Requirements:

1. PDFs for documents.
2. Native files where applicable (DWG, RVT, XLSX).
3. Photos: JPG or PNG.
4. Videos: MP4.
5. Drone files: MP4 + stills.
6. All files must be searchable, non-password protected, and free of proprietary viewing restrictions.

F. Organization and Indexing:
1. Contractor to provide:
a. A master digital index.
b. Folder structure aligned to Division 01 categories.
c. Hyperlinked table of contents where feasible.

G. Acceptance and Final Payment:
1. Submit digital surface and contents prior to final retention release.
2. District reserves the right to reject incomplete or improperly organized submissions.
3. Final payment shall not be processed until complete digital turnover is accepted.

PART 2 -PRODUCTS - NOT USED

PART 3 - EXECUTION

3.01 RECORD DRAWINGS

A. Record Documents: Maintain one set of marked-up PDF copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
b. Accurately record information in an acceptable drawing technique.
c. Record data as soon as possible after obtaining it.
d. Record and check the markup before enclosing concealed installations.
e. Cross-reference record prints to corresponding archive photographic documentation.
2. Content: Types of items requiring marking include, but are not limited to, the following:
a. Field changes of dimensions from Drawings.
b. Revisions to details shown on Drawings.

1) Details not on original Contract Drawings. Application of copies of details produced and provided by Architect during construction will be accepted.

c. Depths of foundations and footing, measured in relation to finish First Floor datum.

d. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent ground improvements.

e. Revisions to routing of piping and conduits.

f. Revisions to electrical circuits.

g. Actual equipment locations and sizes.

h. Duct size and routing.

i. Locations of concealed internal utilities.

j. Permanent Room names and Room numbers.

k. Changes made by Change Order or Construction Change Directive.

l. Changes made following written orders by District or Owner Representative.

m. Changes made following Architect's written orders.

n. Note clarifications from RFI's.

o. Field records for variable and concealed conditions.

p. Record information on the Work that is shown only schematically.

3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.

4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.

5. Mark important additional information that was either shown schematically or omitted from original Drawings.

6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Record Digital Data Files: Immediately before Final Inspection, review marked-up record prints with Architect. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:

1. Format: Same digital data software program, version, and operating system as the original Contract Drawings.

a. Format: DWG, Version, Microsoft Windows operating system.

2. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.

3. Refer instances of uncertainty to Architect and Owner Representative for resolution.

4. Architect will furnish Contractor one set of digital data files of the Contract Drawings for use in recording information.

a. See Section 013550 for requirements related to use of Architect's digital data files.

b. Architect will provide data file layer information. Record markups in separate layers.

C. Newly Prepared Record Drawings: Prepare new Drawings instead of preparing record Drawings where Architect determines that neither the original Contract Drawings nor Shop Drawings are suitable to show actual installation.

1. New Drawings may be required when a Change Order is issued as a result of accepting an alternate, substitution, or other modification.
2. Consult Architect and Owner Representative for proper scale and scope of detailing and notations required to record the actual physical installation and its relation to other construction. Integrate newly prepared record Drawings into record Drawing sets; comply with procedures for formatting, organizing, copying, binding, and submitting.

D. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.

1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
2. Format: Annotated PDF electronic file with comment function enabled.
3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
4. Identification:
    a. Project name and number.
    b. Date.
    c. Designation "PROJECT RECORD DRAWINGS."
    d. Name of Architect and Owner Representative.
    e. Name of Contractor.

3.02 RECORD SPECIFICATIONS

A. Preparation: Mark Specifications in PART 2 to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
4. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
5. Note related Change Orders, record Product Data, and Record Drawings, where applicable.

B. Format: Submit record Specifications as annotated PDF electronic file.

3.03 RECORD DESIGN AND ENGINEERING DATA

A. Fire Systems:

1. Provide updated SDU files at each:

a. One flash drive placed inside fire panel cabinet.

b. One flash drive turned over to District.

c. One file copy emailed Operations and Facilities Director or District.

3.04 RECORD PRODUCT DATA

A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.

2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.

3. Note related Change Orders, record Specifications, and record Drawings where applicable.

B. Format: Submit record Product Data as annotated PDF electronic file.

1. Include record Product Data directory organized by Specification Section number and title, electronically linked to each item of record Product Data.

3.05 RECORD SAMPLES

A. Immediately before date of Final Inspection, meet with District or Owner Representative at Project site to determine which Samples maintained during the construction period aer to be transmitted to District or Owner Representative for record purposes.

B. Comply with District or Owner Representative's instructions for packaging, identification, marking, and delivery to District or Owner Representative's Sample storage space. Dispose of other Samples in the manner specified for disposing surplus and waste materials

3.06 RECORD PHOTOS AND VIDEO

A. Photograph all work before covering up, including:

1. All open trenches and manholes shall be photographed.

2. All exposed utilities should be identified in the photos.

3. Show photograph locations and dates on Record Drawings.

B. Interior video recording of all underground sewer and storm drain lines, under the building and outside to and including the on-site or utility connection.

3.07 MISCELLANEOUS RECORD SUBMITTALS

A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

1. Field records on excavations and foundations.

2. Field records on underground construction and similar work.
3. Surveys showing locations and elevations of underground lines.
4. Invert elevations of drainage piping.
5. Surveys establishing building lines and levels.
6. Authorized measurements using unit prices or allowances.
7. Records of plant treatment.
8. Ambient and substrate condition tests.
9. Certifications received in lieu of labels on bulk products.
10. Batch mixing and bulk delivery records.
11. Testing and qualification of trade persons.
12. Documented qualification of installation firms.
13. Load and performance testing.
14. Inspections and certifications by governing authorities.
15. Leakage and water-penetration tests.
16. Fire-resistance and flame-spread test results.
17. Final inspection and correction procedures.

B. Format: Submit miscellaneous record submittals as PDF electronic file.
   1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

3.08 SUBMISSION

A. Keep Project Record Documents current, as they will be reviewed for completeness by Architect, Engineer, Project Inspector, and Owner Representative; as a condition of certification for each Progress Payment Application.

B. Prior to the date of the Notice of Completion, submit marked Record Documents to Architect and Owner Representative for review, approval and further processing.

3.09 RECORDING AND MAINTENANCE

A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.

B. Review of documents by Architect, Engineer, Project Inspector, or Owner Representative to be in concert with approval of the monthly Application for Payment.

C. Maintenance of Record Documents and Samples:
   1. Store record documents and Samples in the field office apart from the Contract Documents used for construction.
   2. Do not use project record documents for construction purposes.
   3. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss.

4. Provide access to project record documents for Architect and Owner Representative reference during normal working hours.

END OF SECTION

SECTION 01 79 00
DEMONSTRATION AND TRAINING

PART 1 GENERAL

1.01 SUMMARY

A. Demonstration of products and systems where indicated in specific specification sections.

B. Training of District personnel in operation and maintenance is required for:

1. All software-operated systems.
2. Landscape irrigation.
3. Additional systems as requested by District.
4. Items specified in individual product Sections.

C. Training of District personnel in care, cleaning, maintenance, and repair is required for:

1. Roofing, waterproofing, and other weather-exposed or moisture protection products.
2. Finishes, including flooring, wall finishes, ceiling finishes.
3. Fixtures and fittings.
4. Items specified in individual product Sections.
5. Additional systems as requested by District.

1.02 RELATED REQUIREMENTS

A. Section 01 78 00 - Closeout Submittals: Operation and maintenance manuals.

B. Other Specification Sections: Additional requirements for demonstration and training.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Draft Training Plans: District will designate personnel to be trained; tailor training to needs and skill-level of attendees.

1. Each Sub, Design-Builder SubContractor and vendor responsible for training submits a written training plan to the Architect, District, and Owner Representative for review and approval prior to training.
2. Submit not less than four weeks prior to start of training.
3. Revise and resubmit until acceptable.
4. Provide an overall schedule showing all training sessions.
5. Include at least the following for each training session:
    a. Identification, date, time, and duration.
    b. Description of products and/or systems to be covered.
        1) Equipment list
    c. Name of firm and person conducting training; include qualifications.

d. Intended audience, such as job description.

e. Objectives of training and suggested methods of ensuring adequate training.

1) Agenda and subjects (design intent, equipment inspections, modes of operation, system interactions, troubleshooting, preventative maintenance, etc.)

f. Methods to be used, such as classroom lecture, live demonstrations, hands-on, etc.

g. Media to be used, such a slides, hand-outs, etc.

1) The approved O&M manuals shall be used during the training for equipment specific references.

h. Training equipment required, such as projector, projection screen, etc., to be provided by Contractor.

C. Training Manuals: Provide training manual for each attendee; allow for minimum of two attendees per training session.

1. Include applicable portion of O&M manuals.

2. Include copies of all hand-outs, slides, overheads, video presentations, etc., that are not included in O&M manuals.

3. Provide one extra copy of each training manual to be included with operation and maintenance data.

D. Training Reports:

1. Identification of each training session, date, time, and duration.

2. Sign-in sheet showing names and job titles of attendees.

3. List of attendee questions and written answers given, including copies of and references to supporting documentation required for clarification; include answers to questions that could not be answered in original training session.

E. Video Recordings: Submit digital video recording of each demonstration and training session for District's subsequent use.

1. Format: DVD Disc, USB Flash drive, and/or cloud access.

2. Label each with session identification and date.

3. Edit training video so that the content is comprehensive and cohesive.

1.04 QUALITY ASSURANCE

A. Instructor Qualifications: Familiar with design, operation, maintenance and troubleshooting of the relevant products and systems.

1. Provide as instructors the most qualified trainer of those contractors and/or installers who actually supplied and installed the systems and equipment.

2. Where a single person is not familiar with all aspects, provide specialists with necessary qualifications.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 TRAINING OF OWNER PERSONNEL

A. The Contractor and Design-Builder SubContractors shall be responsible for training coordination and scheduling and for ensuring that training is completed.

B. The Commissioning Authority (CA) shall be responsible for reviewing and approving the content of the training of Owner personnel for commissioned equipment.

C. The specific training requirements of District personnel by Subs, Design-Builder SubContractors and vendors is specified in the Division in which the equipment is specified.

D. For primary HVAC equipment, the Controls Contractor shall provide a short discussion of the control of the equipment during the mechanical or electrical training conducted by others.

3.02 DEMONSTRATION - GENERAL

A. Demonstrations conducted during system start-up do not qualify as demonstrations for the purposes of this section, unless approved in advance by District.

B. Demonstration may be combined with District personnel training if applicable.

C. Operating Equipment and Systems: Demonstrate operation in all modes, including start-up, shut-down, seasonal changeover, emergency conditions, and troubleshooting, and maintenance procedures, including scheduled and preventive maintenance.

1. Perform demonstrations not less than two weeks prior to Final Inspection.
2. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.

D. Non-Operating Products: Demonstrate cleaning, scheduled and preventive maintenance, and repair procedures.

1. Perform demonstrations not less than two weeks prior to Final Inspection.

3.03 TRAINING - GENERAL

A. Conduct training on-site unless otherwise indicated.

B. District will provide classroom and seating at no cost to Contractor.

C. Provide training in minimum two hour segments.

D. Training schedule will be subject to availability of District's personnel to be trained; re-schedule training sessions as required by District; once schedule has been approved by District failure to conduct sessions according to schedule will be cause for District to charge Contractor for personnel "show-up" time.

E. Review of Facility Policy on Operation and Maintenance Data: During training discuss:

1. The location of the O&M manuals and procedures for use and preservation; backup copies.
2. Typical contents and organization of all manuals, including explanatory information, system narratives, and product specific information.

3. Typical uses of the O&M manuals.

F. Product- and System-Specific Training:

1. Review the applicable O&M manuals.
2. For systems, provide an overview of system operation, design parameters and constraints, and operational strategies.
3. Review instructions for proper operation in all modes, including start-up, shut-down, seasonal changeover and emergency procedures, and for maintenance, including preventative maintenance.
4. Provide hands-on training on all operational modes possible and preventive maintenance.
5. Emphasize safe and proper operating requirements; discuss relevant health and safety issues and emergency procedures.
6. Discuss common troubleshooting problems and solutions.
7. Discuss any peculiarities of equipment installation or operation.
8. Discuss warranties and guarantees, including procedures necessary to avoid voiding coverage.
9. Review recommended tools and spare parts inventory suggestions of manufacturers.
10. Review spare parts and tools required to be furnished by Contractor.
11. Review spare parts suppliers and sources and procurement procedures.

G. Be prepared to answer questions raised by training attendees; if unable to answer during training session, provide written response within three days.

END OF SECTION

SECTION 02 41 00
DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Selective demolition of built site elements.
   1. Demolition and removal of existing site improvements within Project area, as indicated on Drawings and as necessary to accomplish the Work, including:
      a. Asphaltic concrete and portland cement concrete paving.
      b. Abandoned underground utility lines outside of utility easement.
      c. Pavement cutting and removal.
      d. Debris removal.
   2. Handling and disposal of removed materials.
   3. Dewatering of excavations as necessary to control surface and sub-surface water.

B. Selective demolition of building elements for alteration purposes.

C. Abandonment and removal of existing utilities and utility structures.

1.02 RELATED REQUIREMENTS

A. Section 01 10 00 - Summary: Limitations on Contractor's use of site and premises.

B. Section 01 10 00 - Summary: Description of items to be removed by District.

C. Section 01 10 00 - Summary: Description of items to be salvaged or removed for re-use by Contractor.

D. Section 01 50 00 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.

E. Section 01 60 00 - Product Requirements: Handling and storage of items removed for salvage and relocation.

F. Section 01 70 00 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring.

G. Section 01 74 19 - Construction Waste Management and Disposal: Limitations on disposal of removed materials; requirements for recycling.

1.03 DEFINITIONS

A. Class III Landfill: A landfill that accepts non-hazardous materials such as household, commercial, and industrial waste, resulting from construction, remodeling, repair, and demolition operations. A Class III landfill must have a solid waste facilities permit from the State of California.

B. Demolition: Dismantle, raze, destroy or wreck any building or structure or any part thereof.

1. Demolition Waste: Building materials and solid waste resulting from construction, remodeling, repair, cleanup, or demolition operations that are not hazardous. This term includes, but is not limited to, asphalt concrete, Portland cement concrete, brick, lumber, gypsum wallboard, cardboard and other associated packaging, roofing material, ceramic tile, carpeting, plastic pipe, and steel. The materials may include rock, soil, tree stumps, and other vegetative matter resulting from land clearing and landscaping for construction or land development projects.

C. Environmental Pollution and Damage: The presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human or animal life; affect other species of importance to humanity; or degrade the utility of the environment for aesthetic, cultural or historical purposes.

D. Inert Fill: A permitted facility that accepts inert waste such as asphalt and concrete exclusively for the purpose of disposal.

1. Inert Solids/Inert Waste: Non-liquid solid waste including, but not limited to, soil and concrete, that does not contain hazardous substances or soluble pollutants at concentrations in excess of water-quality standards established by a regional water board and does not contain significant quantities of decomposable solid waste.

E. Recycling: The process of sorting, cleansing, treating and reconstituting materials for the purpose of using the altered form in the manufacture of a new product. Recycling does not include burning, incinerating or thermally destroying solid waste.

F. Remove: Detach or dismantle items from existing construction and dispose of them off site, unless items are indicated to be salvaged or reinstalled.

G. Remove and Salvage: Detach or dismantle items from existing construction in a manner to prevent damage. Clean, package, label and deliver salvaged items to District in ready-for-reuse condition.

H. Remove and Reinstall: Detach or dismantle items from existing construction in a manner to prevent damage. Clean and prepare for reuse and reinstall where indicated.

I. Reuse: The use, in the same or similar form as it was produced, of a material which might otherwise be discarded.

J. Existing to Remain: Designation for existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.

K. Waste:

1. Chemical Waste: Includes petroleum products, bituminous materials, salts, acids, alkalis, herbicides, pesticides, organic chemicals and inorganic wastes.

2. Solid Waste: All putrescible and nonputrescible solid, semisolid, and liquid wastes, including garbage, trash, refuse, paper, rubbish, ashes, industrial wastes, demolition and construction wastes, abandoned vehicles and parts thereof, discarded home and industrial appliances, dewatered, treated, or chemically fixed sewage sludge which is not hazardous waste, manure, vegetable or animal solid and semisolid wastes, and other discarded solid and semisolid wastes. "Solid waste" does not include hazardous waste, radioactive waste, or medical waste as defined or regulated by State law.

1.04 REFERENCE STANDARDS

A. 29 CFR 1926 - Safety and Health Regulations for Construction.

B. CBC Ch. 33 - Safeguards During Construction.

C. CFC Ch. 33 - Fire Safety During Construction and Demolition.

D. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Pre-Construction Conference: Conduct a pre-construction conference one week prior to the start of the work of this section; require attendance by all affected trades.

B. Convene a conference at the Project site 3 days prior to starting demolition to review the Drawings and Specifications, requirements of authorities having jurisdiction, instructions and requirements of serving utilities, sequencing and interface considerations and project conditions.

C. Conference shall be attended by Owner Representative, supervisory and quality control personnel of Contractor and all subcontractors performing this and directly-related Work.

D. Submit minutes of meeting to District, Project Inspector and Architect, for Project record purposes.

E. Sequencing: Ensure that utility connections are achieved in an orderly and expeditious manner.

1.06 MATERIALS OWNERSHIP

A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain property of Lake Elsinore Unified School District, demolished materials shall become the Contractor's property and shall be removed, recycled, or disposed from Project site in an appropriate and legal manner.

1. Arrange a meeting no less than ten (10) days prior to demolition with the District or Owner Representative and other designated representatives to review any salvageable items to determine if District wants to retain ownership, and discuss Contractor's Waste Management and Recycling Plan.

B. Storage or sale of removed items or materials on-site will not be permitted without advance written approval from Owner Representative.

1.07 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Site Plan: Indicate:

1. Vegetation to be protected.
2. Areas for temporary construction and field offices.
3. Areas for temporary and permanent placement of removed materials.

C. Demolition Plan: Submit demolition plan as required by OSHA and local AHJs.

1. Indicate extent of demolition, removal sequencing, bracing and shoring, and location and construction of barricades and fences.

2. Demolition firm qualifications.

D. Demolition phase:

1. Proposed dust-control measures.
2. Proposed noise-control measures.
3. Schedule of demolition activities indicating the following:
    a. Detailed sequence of demolition and removal work, including start and end dates for each activity.
    b. Dates for shutoff, capping, and continuation of utility services.
4. If hazardous materials are encountered and disposed of, landfill records indicating receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.
5. Contractor's Waste Management and Recycling Plan: See Section 01 74 19 - Construction Waste Management and Disposal.
    a. This plan will not otherwise relieve the Contractor of responsibility for adequate and continuing control of pollutants and other environmental protection measures.
6. Contractor's Reuse, Recycling, and Disposal Report: See Section 01 74 19 - Construction Waste Management and Disposal.

E. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

1. Record drawings: Identify and accurately locate capped utilities and other subsurface structural, electrical, or mechanical conditions.

1.08 SUBMITTALS

A. Demolition and Removal Procedures and Schedule: Submit for Project record only.

B. Project Record Drawings: Submit in accordance with provisions specified in Section 01 78 00 - Closeout Submittals. Indicate verified locations of underground utilities and storm drainage system on project record drawings.

1.09 QUALITY ASSURANCE

A. Demolition Firm Qualifications: Company specializing in the type of work required.

1. Minimum of 5 years of documented experience.

1.10 SCHEDULING

A. Schedule Work to precede new construction.

B. Describe demolition removal procedures and schedule.

C. Perform work between the hours of 8am and 5pm, subject to noise abatement regulations and District's approval for noise considerations.

PART 2 PRODUCTS -- NOT USED

PART 3 EXECUTION

3.01 DEMOLITION

A. Remove the entire building as indicated on Site Demolition Plan C1.00.

1. Demolish buildings completely and remove from the site. Use methods required to complete Work within limitations of governing regulations:

a. Locate demolition equipment throughout the building and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

b. Demolish concrete and masonry in sizes that will be suitable for acceptance at recycling or disposal facilities.

c. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.

d. Break up and remove concrete slabs on grade in small sizes, suitable for acceptance at recycling or disposal facilities, unless otherwise shown to remain.

e. Remove all disconnected, abandoned utilities on site.

B. Remove paving and curbs required to accomplish new work.

C. Remove all other paving and curbs within construction limits indicated on drawings.

D. Within area of new construction, remove foundation walls and footings to minimum 2 feet below finished grade.

1. Below-Grade Construction: Demolish foundation walls and other below-grade construction:

a. Completely remove below-grade construction, including foundation walls and footings, unless indicated otherwise on Drawings.

b. Break up and completely remove below-grade concrete slabs, in small sizes, suitable for acceptance at recycling or disposal facilities.

c. Below-Grade Areas: Completely fill below-grade areas and voids resulting from building demolition operations to street level with satisfactory soil materials.

E. Remove concrete slabs on grade within construction limits indicated on drawings.

F. Remove manholes and manhole covers, curb inlets and catch basins.

G. Remove fences and gates.

H. Remove other items indicated, for salvage, relocation, and recycling.

I. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill as required so that required rough grade elevations do not subside within one year after completion.

3.02 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Conform to the relevant Article of the General Conditions, South Coast Air Quality Management District and other applicable regulatory procedures when discovering hazardous or contaminated materials.

B. Selective Demolition of Site and Building Elements:

1. Use techniques acceptable to authorities having jurisdiction and which will achieve intended results and provide protection of surrounding features to remain.
2. Some items may have been demolished prior to Work of this Contract. Verify existing conditions prior to start of demolition. If items are or have been demolished contact the Architect.
3. Some items may require postponement of demolition until late in Contract Time period.
4. Phase demolition as necessary to provide adequate interfacing of related Work.
5. Demolish in an orderly and careful manner. Protect existing foundations, retaining walls, utility structures, other structures and finish materials to remain.

C. Field Measurements and Conditions:

1. Survey existing conditions and correlate with requirements indicated to determine extent of demolition and recycling required.
2. In addition to provisions of the Conditions of the Contract, verify dimensions and field conditions prior to construction. Verify condition of substrate and adjoining Work before proceeding with demolition Work. If conflict is found notify Owner Representative, Project Inspector and Architect.

D. Comply with requirements in Section 01 70 00.

E. Comply with governing EPA notification regulations before starting demolition. Comply with hauling and disposal regulations of authorities having jurisdiction. Obtain and pay for all permits required.

F. Environmental Controls

1. Comply with federal, state and local regulations pertaining to water, air, solid waste, recycling, chemical waste, sanitary waste, sediment and noise pollution.
2. Protection of Natural Resources: Preserve the natural resources within the project boundaries or restore to an equivalent condition.
3. Confine demolition activities to areas defined by public roads, easements, and work area limits indicated on the drawings.
4. Temporary Construction: Remove indications of temporary construction facilities, such as haul roads, work areas, structures, stockpiles or waste areas.
5. Water Resources: Comply with applicable regulations concerning the direct or indirect discharge of pollutants to underground and natural surface waters.
    a. Oily Substances: Prevent oily or other hazardous substances from entering the ground, drainage areas, or local bodies of water in such quantities as to affect normal use, aesthetics, or produce a measurable ecological impact on the area.

1) Store and service construction equipment at areas designated for collection of oil wastes.

6. Dust Control, Air Pollution, and Odor Control: Prevent creation of dust, air pollution and odors.
   a. Use temporary enclosures and other appropriate methods to limit dust and dirt rising and scattering in air to lowest practical level.
   b. Store volatile liquids, including fuels and solvents, in closed containers.
   c. Properly maintain equipment to reduce gaseous pollutant emissions.
7. Noise Control: Perform demolition operations to minimize noise.
   a. Repetitive, high level impact noise will be permitted only during the times indicated in Section 01 70 00 - Execution and Closeout Requirements.

G. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
   1. Obtain required permits.
   2. Comply with applicable requirements of NFPA 241, CBC Ch. 33, and CFC Ch. 33.
   3. Use of explosives is not permitted.
   4. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
      a. Survey condition of the building to determine whether removing any element might result in a structural deficiency or unplanned collapse of any portion of the structure or adjacent structures during demolition.
         1) Retain a licensed and qualified civil or structural engineer to provide analysis, including calculations, necessary to ensure the safe execution of the demolition work.
      b. Prevent movement or settlement of adjacent structures. Provide bracing and shoring.
      c. Perform surveys as the Work progresses to detect hazards resulting from demolition activities.
   5. Provide, erect, and maintain temporary barriers and security devices.
      a. Provide, erect, and maintain temporary barriers, safety and security devices , for protection of streets, sidewalks, curbs, adjacent property and the public.
      b. Protection: Protect existing construction and adjacent areas with temporary barriers and security devices in accordance with requirements specified in Section 01 50 00 - Temporary Facilities and Controls.
         1) Review location and type of construction of temporary barriers with District and/or the Owner Representative.
         2) Barriers shall control dust, debris and provide protection for persons occupying and using adjacent facilities.

3) Maintain protected egress and access at all times, in accordance with requirements of authorities having jurisdiction.

6. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
7. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
8. Do not close or obstruct roadways or sidewalks without permits from authority having jurisdiction.
9. Conduct operations to minimize obstruction of public and private entrances and exits. Do not obstruct required exits at any time. Protect persons using entrances and exits from removal operations.
10. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon, or limit access to their property.

H. Do not begin removal until receipt of notification to proceed from District.

I. Do not begin removal until built elements to be salvaged or relocated have been removed.

J. Do not begin removal until vegetation to be relocated has been removed and vegetation to remain has been protected from damage.

K. Protect existing structures and other elements to remain in place and not removed.

1. Provide bracing and shoring.
2. Prevent movement or settlement of adjacent structures.
3. Stop work immediately if adjacent structures appear to be in danger.
4. Protect existing landscaping materials, appurtenances, structures and items that are not to be demolished, or are on adjacent property.
5. Mark location of utilities.

L. Minimize production of dust due to demolition operations. Do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

M. Hazardous Materials:

1. Hazardous Materials: Comply with 29 CFR 1926 and state and local regulations.

N. Remove materials to be re-installed or retained in manner to prevent damage. Store and protect in accordance with requirements of Section 01 60 00 - Product Requirements.

O. Perform demolition in a manner that maximizes salvage and recycling of materials.

1. Comply with requirements of Section 01 74 19 - Construction Waste Management and Disposal.
2. Dismantle existing construction and separate materials.
3. Set aside reusable, recyclable, and salvageable materials; store and deliver to collection point or point of reuse.

P. Damages: Promptly repair damages to adjacent facilities caused by demolition operations.

Q. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.

3.03 EXISTING UTILITIES

A. Coordinate work with utility companies. Notify utilities before starting work, comply with their requirements, and obtain required permits.

B. Protect existing utilities to remain from damage.

C. Do not disrupt public utilities without permit from authority having jurisdiction.

D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to District.

E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to District.

F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

H. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone. Identify and mark, in same manner as other utilities to remain, utilities to be reconnected.

3.04 SELECTIVE DEMOLITION FOR ALTERATIONS

A. Existing construction and utilities indicated on drawings are based on casual field observation and existing record documents only.

1. Verify construction and utility arrangements are as indicated.
2. Report discrepancies to Architect before disturbing existing installation.
3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.

B. Separate areas in which demolition is being conducted from areas that remain occupied.

1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 01 50 00 in locations indicated on drawings.
2. Provide sound retardant partitions of construction and in locations indicated on drawings.

C. Maintain weatherproof exterior building enclosure, except for interruptions required for replacement or modifications; prevent water and humidity damage.

D. Remove existing work as indicated and required to accomplish new work.

1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction indicated.
2. Remove items indicated on drawings.
3. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.

E. Services including, but not limited to, HVAC, Plumbing, Fire Protection, and Electrical: Remove existing systems and equipment as indicated.

1. Maintain existing active systems to remain in operation, and maintain access to equipment and operational components.
2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
3. See Section 01 10 00 - Summary for limitations on outages and required notifications.
4. Verify that abandoned services serve only abandoned facilities before removal.
5. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings. Remove back to source of supply where possible, otherwise cap stub and tag with identification.

F. Protect existing work to remain.
1. Prevent movement of structure. Provide shoring and bracing as required.
2. Perform cutting to accomplish removal work neatly and as specified for cutting new work.
3. Repair adjacent construction and finishes damaged during removal work.
4. Patch to match new work.

3.05 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site.

B. Remove materials not to be reused on site; comply with requirements of Section 01 74 19 - Construction Waste Management and Disposal.

C. Remove temporary work.

D. Leave site in clean condition, ready for subsequent work.

E. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

SECTION 03 10 00
CONCRETE FORMING AND ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Formwork for cast-in-place concrete, with shoring, bracing and anchorage.

B. Openings for other work.

C. Form accessories.

D. Form stripping.

1.02 RELATED REQUIREMENTS

A. Section 03 20 00 - Concrete Reinforcing.

B. Section 03 30 00 - Cast-in-Place Concrete.

C. Section 05 50 00 - Metal Fabrications: Placement of embedded steel anchors and plates in cast-in-place concrete.

D. Section 32 13 13 - Concrete Paving: Sidewalks, curbs and gutters.

1.03 REFERENCE STANDARDS

A. ACI CODE-318 - Building Code for Structural Concrete—Code Requirements and Commentary.

B. ACI PRC-347 - Guide to Formwork for Concrete.

C. ACI SPEC-117 - Specification for Tolerances for Concrete Construction and Materials and Commentary.

D. ACI SPEC-301 - Specifications for Concrete Construction.

E. ASTM D695 - Standard Test Method for Compressive Properties of Rigid Plastics.

F. PS 1 - Structural Plywood.

G. CBC Chapter 19A.

1.04 DEFINITIONS

A. Unexposed Finish: A general-use finish, with no appearance criteria, applicable to all formed concrete concealed from view after completion of construction.

B. Exposed Finish: A general-use finish applicable to all formed concrete exposed to view and including surfaces which may receive a paint coating (if any).

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on void form materials and installation requirements.

1. Form release agent.

1.06 QUALITY ASSURANCE

A. Industry Standard: Formwork design and construction shall be in accordance with ACI SPEC-301, ACI CODE-318, and ACI PRC-347.

B. Maintain one copy of each installation standard on site throughout the duration of concrete work.

C. Regulatory Requirements: Conform to formwork construction requirements of the California Building Code (CBC) Title 24, Part 2, Chapter 19A as amended and adopted by authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver prefabricated forms and installation instructions in manufacturer's packaging.

B. Store prefabricated forms off ground in ventilated and protected manner to prevent deterioration from moisture.

PART 2 PRODUCTS

2.01 FORMWORK - GENERAL

A. Provide concrete forms, accessories, shoring, and bracing as required to accomplish cast-in-place concrete work.

B. Design and construct concrete that complies with design with respect to shape, lines, and dimensions.

C. Chamfer outside corners of beams, joists, columns, and walls.

D. Comply with applicable state and local codes with respect to design, fabrication, erection, and removal of formwork.

E. Comply with relevant portions of ACI CODE-318, ACI PRC-347, and ACI SPEC-301.

F. Provide materials for contact with concrete which impart suitable surface quality to completed concrete. Use the following form types:

1. Forms for Exposed Finish Concrete:
    a. Plywood, metal, metal-framed plywood faced, or other acceptable panel-type materials to provide continuous, straight, smooth, exposed surfaces.
    b. Furnish in largest practical sizes to minimize number of joints and to conform to joint system shown on the Drawings.
2. Forms for Unexposed Finish Concrete:
    a. Plywood, lumber, metal, or another acceptable material.
    b. Provide lumber dressed on at least two edges and one side for tight fit.
    c. When unexposed concrete is intended to receive waterproofing, provide form as for exposed finish concrete.

G. Provide materials to construct formwork to support forming materials in contact with concrete, of sufficient capacity to withstand pressures of concrete placement and to support concrete in place until cured, without distortion.

2.02 WOOD FORM MATERIALS

A. Plywood for Architectural Concrete: Marine Grade, APA B-B Plyform Class 1.
   1. APA proprietary concrete form panels designed for high reuse.
   2. HDO for very smooth concrete finish, in Structural I, and with special overlays.
   3. Bond Classification: Exterior. Common Performance Categories: 19/32, 5/8, 11/16, 23/32, 3/4.

B. Softwood Plywood for Concealed Surfaces: PS 1,undamaged face C Grade, Group 2 Plugged EXT or APA Structural I Sheathing.

C. Hardboard: For curved surfaces, tempered hardboard, Masonite Corp., or equal.

D. Lumber: Douglas fir or douglas fir-larch species; appropriate for intended use grade; with grade stamp clearly visible.
   1. Sound and undamaged straight edges, and solid knots, to maintain principal shores to support concrete until minimum strength is achieved as approved by Structural Engineer.

E. Embedded Nailers: Clear all heart redwood or pressure preservative-treated (PPTDF) douglas fir, edges reverse beveled to key into concrete.

2.03 FORMWORK ACCESSORIES

A. Form Ties: Removable, adjustable-length or snap-off type, galvanized metal, fixed length, cone type, with waterproofing washer, free of defects that could leave holes larger than 1 inch in concrete surface.

B. Form Release Agent: Capable of releasing forms from hardened concrete without staining or discoloring concrete or forming bugholes and other surface defects, compatible with concrete and form materials, and not requiring removal for satisfactory bonding of coatings to be applied.
   1. Do not use materials containing diesel oil or petroleum-based compounds.
   2. Does not impair subsequent treatments of concrete surfaces or bond of applied coatings.
   3. Products:
      a. Kaufman Products Inc; FormKote Emulsion: www.kaufmanproducts.net/#sle.
      b. Nox-Crete Inc; BIO-NOX: www.nox-crete.com/#sle.
      c. SpecChem, LLC; Bio Strip WB (water-based): www.specchemllc.com/#sle.
      d. Or Equal Substitutions: See Section 01 60 00 - Product Requirements.

C. Dowel Sleeves: Plastic sleeve and nailable plastic base for smooth, round, steel load-transfer dowels.
   1. Thickness: 0.125 inch
   2. Compression Resistance, ASTM D695: 5,500-8,000 PSI.
   3. Products:
      a. BoMetals, Inc: www.bometals.com/#sle.
      b. Sika Corporation; Speed Dowel: usa.sika.com
      c. Or Equal Substitutions: See Section 01 60 00 - Product Requirements.

D. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Sized as required, of sufficient strength and character to maintain formwork in place while placing concrete.

E. Embedded Anchor Shapes, Plates, Angles and Bars: As specified in Section 05 50 00.

F. Screed Pins and Chairs:

1. Provide units that leave no metal closer than 1-1/2 inch to the plane of the exposed concrete surface.
2. Manufacturers:
    a. Grann Adjustable Quick Screed (800/554-7266).
    b. Dayton Richmond (800/745-3700).
    c. Aztek (877/531-3344).
    d. Or Equal Substitutions: See Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify lines, levels and centers before proceeding with formwork. Ensure that dimensions agree with drawings.

3.02 SYSTEM REQUIREMENTS

A. Formwork Design Requirements: Formwork products and execution specified herein are for finish surface quality only.

1. Design, layout and construction of formwork shall be solely the responsibility of the Contractor.
2. Design and construct formwork, shoring and bracing to conform to California Building Code (CBC), Title 24, Part 2, Chapter 19A requirements and ACI CODE-318.
3. Resulting concrete shall conform to shapes, lines and dimensions indicated and required.

B. Coordination:

1. Coordinate Work specified in this Section with other Sections which require placement of embedded products and provision of openings and recesses.
2. If formwork is placed after reinforcement, resulting in insufficient concrete cover over reinforcement, request instructions from the Architect before proceeding.

3.03 EARTH FORMS

A. Earth (Soil) Forms, General: Except as otherwise indicated on Drawings, conform to ACI SPEC-301, ACI PRC-347, and California Building Code (CBC) requirements. Refer also to notes on Structural Drawings.

B. Hand trim sides and bottom of earth forms. Remove loose soil prior to placing concrete.

3.04 ERECTION - FORMWORK

A. Erect formwork, shoring and bracing to achieve design requirements, in accordance with requirements of ACI SPEC-301, ACI PRC-347, and California Building Code (CBC) Title 24, Part 2 requirements.

B. Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to overstressing by construction loads.

1. Use form ties of sufficient strength and sufficient quantities to prevent formwork spreading.
2. Maintain principal shores to support concrete until minimum required strength is achieved.

C. Arrange and assemble formwork to permit dismantling and stripping. Do not damage concrete during stripping. Permit removal of remaining principal shores.

1. Design and fabricate forms for easy removal, without impact, shock, or damage to concrete surfaces or other portions of the work.
2. Design to support all applied loads until concrete is adequately cured, within allowable tolerances and deflection limits.

D. Align joints and make watertight. Keep form joints to a minimum. Make forms watertight to prevent leakage of concrete mortar. Locate form joints, at exposed concrete, to be symmetrical about center of panel, unless otherwise noted. Align joints symmetrically at exposed conditions.

E. Permanent openings: Provide openings to accommodate Work specified in other Sections. Size and locate openings accurately. Securely support items built into forms; provide additional bracing at openings and discontinuities in formwork.

F. Temporary openings: Provide temporary openings for cleaning and inspection. Provide drain openings at bottoms of formwork to allow water to drain. Locate temporary openings in most inconspicuous locations at base of forms, closed with tight-fitting panels designed to minimize appearance of joints in finished concrete Work.

G. Obtain approval before framing openings in structural members that are not indicated on drawings.

H. Coordinate this section with other sections of work that require attachment of components to formwork.

I. If formwork is placed after reinforcement, resulting in insufficient concrete cover over reinforcement, request instructions from Architect before proceeding.

J. Inspection: Before placing of concrete, and after placement of reinforcing steel in the forms, provide notification so that proper inspection can be made. Make such notification at least 2 working days in advance of placing concrete.

K. Rejection of Defective Work: Any movement or bellying of forms during construction or variations in excess of the tolerances specified shall be considered just cause for the removal of such forms and, in addition, the concrete construction so affected. Reconstruct forms, place new concrete and required reinforcing steel at no additional cost to the District.

3.05 APPLICATION - FORM RELEASE AGENT

A. Form Release Agent: Provide either form materials with factory applied non-absorptive liner or field applied form coating to comply with applicable air quality regulations for VOC. If field applied coating is employed, thoroughly clean and recondition formwork and reapply coating before each use. Rust on form surfaces is not acceptable.

B. Apply form release agent on formwork in accordance with manufacturer's recommendations.

C. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.

D. Do not apply form release agent where concrete surfaces to receive special finishes or applied coverings that are affected by agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces coated prior to placement of concrete.

3.06 INSERTS, EMBEDDED PARTS, AND OPENINGS

A. Provide formed openings where required for items to be embedded in passing through concrete work.

1. Install accessories in accordance with manufacturer's instructions and referenced standards, level, straight and plumb.

B. Locate and set in place items that are cast directly into concrete.

1. Secure in place inserts, embeds, anchors. Wet-setting is not authorized.

C. Coordinate with work of other sections in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, other inserts, and components of other work.

1. Openings: Size and locate formed openings, depressions, recesses and chases to accommodate products to be applied to, built into and pass through concrete Work. Coordinate size, location and placement of inserts, embedded products, openings and recesses with Work specified in other Sections.

2. Anchors and Other Devices: Set and build into concrete formwork anchorage devices and other embedded products required for Work to be attached to or supported by concrete elements.

3. Locating Embedded Products and Openings: Use setting drawings, diagrams, instructions and templates to set embedded products.

4. Screeds: Set screeds and establish level for tops of concrete slabs and leveling for finish surfaces. Shape surfaces as indicated on the Drawings. Provide cradle, pad or base type screed supports for concrete over waterproof membranes and vapor retarders.

D. Install accessories in accordance with manufacturer's instructions, so they are straight, level, and plumb. Ensure items are not disturbed during concrete placement.

E. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at bottom of forms to allow flushing water to drain.

F. Close temporary openings with tight fitting panels, flush with inside face of forms, and neatly fitted so joints are not apparent in exposed concrete surfaces.

3.07 FORM CLEANING

A. Clean forms as erection proceeds, to remove foreign matter within forms.

B. Clean formed cavities of debris prior to placing concrete.

1. At above grade forms, flush with water or use compressed air to remove remaining foreign matter. Ensure that water and debris drain to exterior through clean-out ports.
2. During cold weather, remove ice and snow from within forms. Do not use de-icing salts. Do not use water to clean out forms, unless formwork and concrete construction proceed within heated enclosure. Use compressed air or other means to remove foreign matter.

C. Formwork Reuse: Do not reuse wood and plywood forming materials which contact concrete, except as follows:

1. High density plywood may be cleaned and reused for exposed concrete.
2. Unfaced plywood may be reused for concealed concrete.
3. Steel and fiberglass forming materials may be cleaned and reused.

D. Patching and Repairs: Patch tie holes with sheet metal patches and restore forms to like new condition prior to reuse.

3.08 FORMWORK TOLERANCES

A. Construct formwork to maintain tolerances required by ACI SPEC-117, unless otherwise indicated.

1. Also as specified in ACI CODE-318, ACI SPEC-301, and ACI PRC-347, unless otherwise specified or indicated.

3.09 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00 - Quality Requirements.

B. Inspect erected formwork, shoring, and bracing to ensure that work is in accordance with formwork design, and to verify that supports, fastenings, wedges, ties, and items are secure.

1. Comply with CBC Table 1705A.3, item 14.

C. Do not reuse wood formwork more than 3 times for concrete surfaces to be exposed to view. Do not patch formwork.

3.10 FORM REMOVAL

A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.

1. Comply with California Building Code (CBC) requirements.
2. Formwork supporting weight of concrete may not be removed until concrete has reached a minimum of specified 28-day compressive strength and no earlier than 21 days after pour.
3. Removal of Load Bearing Formwork:
   a. Do not remove shoring and forms supporting weight of concrete, such as beam soffits, joists, slabs, and other structural elements, until concrete has attained its 28 day specified compressive strength, unless otherwise specified or permitted by the Structural Engineer of Record.

b. Determine the actual compressive strength has attained is adequate to support the weight of the concrete and superimposed loads.

c. Maintain curing and protection operations after form removal.

4. Removal of Non Load Bearing Formwork After Superimposed Loads or as Approved by Engineer:

a. Provided that concrete has hardened sufficiently, that it is not damaged, and has achieved sufficient strength to support its own weight and all imposed construction and design loads, forms not actually supporting weight of concrete or weight of soffit forms may be removed after concrete has cured at not less than 50 degrees F for 24 hours.

b. Maintain curing and protection operations after form removal.

B. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.

1. Remove formwork progressively so no unbalanced loads are imposed on structure. Remove formwork without damaging concrete surfaces.

2. Remove or snap off metal spreader ties inside wall surface. Cut nails and form ties off flush and leave surfaces level and clean.

C. Store removed forms to prevent damage to form materials or to fresh concrete. Discard damaged forms.

3.11 PATCHING

A. Schedule: Patch forming and tie holes immediately after form removal.

B. Cleaning: Clean surface of all loose materials and soiling.

C. Patching: Patch all holes and depressions with grouting gun and grout mix of one part cement and 2-1/2 parts mortar sand.

3.12 FORMWORK SCHEDULE

A. Footings and Walls, Not Exposed to View: Site fabricated plywood or lumber, coated with form release agent.

B. Footings and Walls, Exposed to View: Site fabricated plywood, coated with form release agent compatible with applied finish coatings.

END OF SECTION

SECTION 03 20 00
CONCRETE REINFORCING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Reinforcing steel for cast-in-place concrete and masonry.

B. Supports and accessories for steel reinforcement.

1.02 RELATED REQUIREMENTS

A. Section 03 10 00 - Concrete Forming and Accessories.

B. Section 03 30 00 - Cast-in-Place Concrete.

C. Division 26 - Electrical: Grounding connection to concrete reinforcement.

1.03 REFERENCE STANDARDS

A. ACI CODE-318 - Building Code for Structural Concrete—Code Requirements and Commentary.

B. ACI MNL-66 - ACI Detailing Manual.

C. ACI SPEC-301 - Specifications for Concrete Construction.

D. ASTM A184/A184M - Standard Specification for Welded Deformed Steel Bar Mats for Concrete Reinforcement.

E. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.

F. ASTM A996/A996M - Standard Specification for Rail-Steel and Axle-Steel Deformed Bars for Concrete Reinforcement.

G. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.

H. CRSI (DA4) - Manual of Standard Practice.

I. CRSI (P1) - Placing Reinforcing Bars, 10th Edition.

J. DSA BU 24-02 - ACI Modifications to Reinforcing Steel Specifications.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data:

1. Reinforcement supporting and spacing devices at exposed concrete only, to demonstrate non-corroding and non-staining characteristics.

2. Adhesive compounds.

C. Manufacturer's Certificate: Certify that reinforcing steel and accessories supplied for this project meet or exceed specified requirements.

D. Reports: Submit certified copies of mill test report of reinforcement materials analysis.

E. Quality Control Submittals: Submit the following information related to quality assurance requirements specified:

1. Certifications: Submit to the testing laboratory mill test certificates for all reinforcing steel, showing physical and chemical analysis. If steel is to be welded, include in chemical analysis the percentages of carbon, manganese, copper, nickel, and chromium, and optionally the percentages of molybdenum and vanadium.

1.05 QUALITY ASSURANCE

A. Perform work of this section in accordance with ACI CODE-318, ACI MNL-66, ACI SPEC-301, ASTM A184/A184M, and CRSI (P1).

1. Maintain one copy of each document on project site.

B. Regulatory Requirements: Conform to California Building Code (CBC) Title 24 Part 2, Chapter 19A requirements as amended and adopted by authorities having jurisdiction, for details of reinforcement.

C. Provide Architect, Project Inspector, and Special Inspector with access to fabrication plant to facilitate inspection of reinforcement. Provide notification of commencement and duration of shop fabrication in sufficient time to allow inspection.

D. Coordinate Work specified in this Section with other Sections which require placement of embedded products and provision of openings and recesses.

E. If formwork is placed after reinforcement, resulting in insufficient concrete cover over reinforcement, request instructions from Architect (Structural Engineer) before proceeding.

1.06 DELIVERY, STORAGE AND HANDLING

A. Delivery: Deliver reinforcement bars new and free from rust and mill scale in original bundles marked with durable identification tags.

B. Storage: Store reinforcement to avoid excessive rusting or fouling with grease, oil, dirt or other bond-weakening coatings.

C. Handling: Take precautions to maintain reinforcement identification after bundles are broken.

PART 2 PRODUCTS

2.01 REINFORCEMENT

A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi).

1. Deformed billet-steel bars.
2. Unfinished.
3. Comply with DSA BU 24-02. ASTM A615 Grade 60 requires 80,000 psi minimum tensile strength with 1.10 minimum ratio of actual tensile strength to actual yield strength based on mill testing.
    a. Note: The info above is based on ACI 318-19 Table 20.2.1.3(a) and ASTM A615-22. Purpose is to avoid probable failure of tested A615 rebar for 90,000 psi tensile strength per CBC-adopted A615-18e1. See DSA Bulletin BU24-02 for additional information.

B. Reinforcing Steel: #3 Deformed bars, ASTM A615/A615M Grade 40 (280), Type A.

C. Tie Wire: ASTM A1064/A1064M steel wire, unfinished.

D. Reinforcement Accessories:

1. Tie Wire: Annealed, minimum 16 gauge, 0.0508 inch.

2. Chairs, Bolsters, Bar Supports, Spacers: Wire-bar-type devices, complying with CRSI (DA4), for spacing, supporting and fastening reinforcing bars and welded wire reinforcement in place. Sized and shaped for adequate support of reinforcement during concrete placement.

a. Supports at Slab on Grade: Provide devices with load-bearing pads or horizontal runners where base material does not support chair legs, to prevent puncture of vapor retarder/barrier or provide precast concrete block bar supports of equal or greater strength to specified concrete.

b. Corrosion Resistance:

1) Provide stainless steel or plastic components for placement within 1-1/2 inches of weathering surfaces.

(a) Provide plastic coated, plastic-tipped (CRSI, Class 1) or stainless steel types at exposed-to-view concrete surfaces.

(b) Provide only stainless steel (CRSI Class 2) at exterior exposed surfaces to be painted.

2.02 RE-BAR SPLICING:

A. Coupler Systems: Mechanical devices for splicing reinforcing bars; capable of developing 160% of steel reinforcing design strength in tension and compression.

B. Dowel Bar Splicer with Dowel-Ins: Mechanical devices for connecting dowels; Type II capable of developing 160% of steel reinforcing design strength in tension and compression.

C. Grout: Cementitious, non-metallic, non-shrink grout for use with manufacturer's grout sleeve reinforcing bar coupler system.

2.03 FABRICATION

A. Fabricate concrete reinforcing in accordance with CRSI (DA4) - Manual of Standard Practice.

B. Welding of reinforcement is not permitted.

C. Locate reinforcing splices not indicated on drawings at point of minimum stress. See Structural Drawings,

1. Review locations of splices with Architect (Structural Engineer) before fabrication and placement. .

PART 3 EXECUTION

3.01 PREPARATION

A. Cleaning: Clean reinforcement to remove loose rust and mill scale, soil, and other materials which may reduce or destroy bond with concrete.

B. Adjustment and Inspection: Do not bend or straighten reinforcement in a manner injurious to material. Do not use bars with kinks or bends not shown on Drawings and reviewed shop drawings, or bars with reduced cross-section due to corrosion or other cause.

C. Do not bend bars No. 5 and larger in the field.

D. Do not bend bars more than once in the same location.

3.02 PLACEMENT

A. General: Place and secure reinforcement as specified herein, as indicated and noted on Drawings and in compliance with recommended details and methods of reinforcement placement and support specified in CRSI Placing Reinforcing Bars.

B. Place, support and secure reinforcement against displacement. Do not deviate from required position.

1. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.

C. Do not displace or damage vapor barrier.

D. Accommodate placement of formed openings.

E. Maintain concrete cover around reinforcing as indicated on Structural Drawings:

F. Comply with applicable code for concrete cover over reinforcement.

1. If not otherwise indicated on Drawings or specified herein, provide concrete cover in compliance with ACI CODE-318.

G. Bond and ground all reinforcement to requirements of Division 26.

H. Coordination: Locate reinforcement to accommodate embedded products and formed openings and recesses.

I. Slab on Grade Reinforcement: Do not displace or damage vapor retarder/barrier at slab on grade.

J. Wire Reinforcement Placement: Place reinforcement in sheets as long as practicable, lapping adjoining pieces at least one full mesh and lace splices with 16 gage wire. Offset end laps in adjacent widths to prevent continuous laps. Extend reinforcement to within 1-inch of edge at slabs on grade. Cut mesh at expansion joints and full depth control joints.

K. Dowels: Secure tie dowels in place before depositing concrete. Provide No. 3 bars for securing dowels where no other reinforcement is provided.

L. Reinforcement Splices, General: Provide standard reinforcement splices by lapping ends, placing bars in contact and tightly wire tying. Comply with details and requirements of ACI CODE-318 for minimum lap of spliced bars and criteria indicated on the Drawings.

1. Clearances for Splices: Wherever possible, provide minimum 1-1/2 inch clearance between sets of splices. Stagger horizontal bars so that adjacent spices are minimum 48 inches apart.

M. Reinforcement Supports: Support reinforcement on metal chairs, spacers or metal hangers to provide required coverage and to properly locate reinforcement. Do not use wood. Avoid cutting or puncturing vapor retarder/barrier during reinforcement placement and concreting operations. Repair damages before placing concrete.

1. Support Spacing: Space chairs and accessories in conformance with CRSI Placing Reinforcing Bars.

N. Corrections During Concrete Placement: Maintain reinforcing steel workers on-site during placement of concrete for resetting reinforcement displaced by runways, workers and other causes.

3.03 FIELD QUALITY CONTROL

A. An independent testing agency, as specified in Section 01 40 00 - Quality Requirements, will inspect installed reinforcement for compliance with contract documents before concrete placement.

1. Concrete floor slabs on grade are to be continuously inspected as recommended in the geotechnical report.

B. Inspector of Record, as specified in Section 01 45 33 - Code-Required Special Inspections and Procedures, will inspect installed reinforcement for conformance to contract documents before concrete placement.

1. Concrete floor slabs on grade are to be continuously inspected as recommended in the geotechnical report.

C. Defective Reinforcement Work: The following shall be considered defective and may be ordered to be removed and reconstructed at no change in Contract Time or Sum.

1. Bars with kinks or bends not shown on Drawings.
2. Bars injured due to bending or straightening.
3. Bars heated or bent.
4. Reinforcement not placed in accordance with Drawings and Specifications.
5. Rusty or oily bars.
6. Bars exposed in surface of concrete or without adequate concrete cover.

END OF SECTION

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Floors and slabs on grade.

B. Joint devices associated with concrete work.

C. Miscellaneous concrete elements, including equipment pads and thrust blocks.

D. Concrete curing.

1.02 RELATED REQUIREMENTS

A. Section 03 10 00 - Concrete Forming and Accessories: Forms and accessories for formwork.

B. Section 03 20 00 - Concrete Reinforcing.

C. Section 07 92 00 - Joint Sealants: Products and installation for sealants and joint fillers for saw cut joints and isolation joints in slabs.

D. Section 32 13 13 - Concrete Paving: Sidewalks, curbs and gutters.

1.03 REFERENCE STANDARDS

A. ACI 302.2R - Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials.

B. ACI 318 - Building Code Requirements for Structural Concrete.

C. ACI CODE-318 - Building Code for Structural Concrete—Code Requirements and Commentary.

D. ACI PRC-211.1 - Selecting Proportions for Normal-Density and High Density-Concrete - Guide.

E. ACI PRC-302.1 - Guide to Concrete Floor and Slab Construction.

F. ACI PRC-302.2 - Concrete Slabs that Receive Moisture-Sensitive Flooring Materials - Guide.

G. ACI PRC-304 - Guide for Measuring, Mixing, Transporting, and Placing Concrete.

H. ACI PRC-305 - Guide to Hot Weather Concreting.

I. ACI PRC-306 - Guide to Cold Weather Concreting.

J. ACI PRC-308 - Curing of Concrete—Guide.

K. ACI SPEC-301 - Specifications for Concrete Construction.

L. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures.

M. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.

N. ASTM A706/A706M - Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement.

O. ASTM C31/C31M - Standard Practice for Making and Curing Concrete Test Specimens in the Field.

P. ASTM C33/C33M - Standard Specification for Concrete Aggregates.

Q. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.

R. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete.

S. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 50 mm [2 in.] Cube Specimens).

T. ASTM C111/C111M - Standard Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans for Use in Portland-Cement Concrete.

U. ASTM C143/C143M - Standard Test Method for Slump of Concrete.

V. ASTM C150/C150M - Standard Specification for Portland Cement.

W. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete.

X. ASTM C172/C172M - Standard Practice for Sampling Freshly Mixed Concrete.

Y. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.

Z. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete.

AA. ASTM C579 - Standard Test Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes.

BB. ASTM C618 - Standard Specification for Coal Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.

CC. ASTM C827/C827M - Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens of Cementitious Mixtures.

DD. ASTM C881/C881M - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete.

EE. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete.

FF. ASTM C1059/C1059M - Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete.

GG. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).

HH. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures.

II. ASTM C1315 - Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.

JJ. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete.

KK. ASTM D695 - Standard Test Method for Compressive Properties of Rigid Plastics.

LL. ASTM D1709 - Standard Test Methods for Impact Resistance of Plastic Film by the Free-Falling Dart Method.

MM. ASTM D2103 - Standard Specification for Polyethylene Film.

NN. ASTM E1643 - Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.

OO. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.

PP. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.

QQ. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.

RR. AWS D1.4/D1.4M - Structural Welding Code - Steel Reinforcing Bars.

SS. CBC - California Building Code.

TT. DSA IR 17-13 - Batch Plant Inspection.

UU. ICC-ES AC308 - Acceptance Criteria for Post-Installed Adhesive Anchors in Concrete Elements.

VV. ISO 14025 - Environmental Labels and Declarations - Type III Environmental Declarations - Principles and Procedures.

WW. NSF 61 - Drinking Water System Components - Health Effects.

XX. NSF 372 - Drinking Water System Components - Lead Content.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.

1. For curing compounds, provide data on method of removal in the event of incompatibility with floor covering adhesives.
2. For membrane-forming, moisture emission-reducing, curing and sealing compound, provide manufacturer's installation instructions,.

C. Mix Design: Submit proposed concrete mix design.

1. Indicate proposed mix design complies with requirements of ACI SPEC-301, Section 4 - Concrete Mixtures.
2. Indicate proposed mix design complies with requirements of ACI CODE-318, Chapter 19 - Concrete: Design and Durability Requirements, and Chapter 26 - Construction Documents and Inspection.
    a. Reports must include all the data as required to verify conformance with ACI CODE-318, Section 26.4.2.2, and the following:
        1) Mix design identification number.
        2) Cement certification.
        3) Fly ash certification of compliance or test data.
        4) Admixture data.
        5) Aggregate test data.
3. Mix Designs Utilizing 15% Or More Fly Ash: Proportioning conform to ACI CODE-318, Section 26.4.3.

4. Mix Design Review and Approval Process: An engineer from a DSA approved (LEA) testing laboratory shall review the mix design report and the design professional in responsible charge of the project shall approve the mix design.
    a. Review by LEA Engineer: A qualified civil engineer associated with a DSA approved (LEA) testing laboratory shall review the report for conformance with ACI CODE-318, Sections 26.4.2.2. Issue an evaluation report of findings and recommendation for either acceptance or rejection and forward his report to the design professional in responsible charge of the project.
    b. Approval by the Project Engineer in Responsible Charge: Based on the findings and recommendation of the LEA engineer's evaluation report, the project design professional in responsible charge decides whether to accept or reject the mix design. He will issue a letter stating his acceptance or rejection. The letter shall be sent to DSA, and copied to the project inspector, the LEA laboratory, and the mix design engineer.
    c. Documentation by the Concrete Supplier: The concrete supplier shall submit copies of the cement certification, fly ash certification of compliance or test data, admixture data, aggregate test data, and mix design identification number to the project inspector and the LEA engineer who reviewed the mix design report.
5. Indicate proposed mix design complies with admixture manufacturer's written recommendations.
6. Mix Design: Submit mix designs prepared, stamped and signed by a Civil Engineer licensed in the State of California.

D. Samples: Submit samples of underslab vapor retarder to be used.

E. Samples: Submit two, 12 inch long samples of waterstops and construction joint devices.

F. Quality Control Submittals:
1. Field tests: Submit reports of all slump, strength and air content tests as required by authorities having jurisdiction and as indicated on the Drawings and specified herein.
2. Delivery tickets: Have available copies of delivery tickets complying with ASTM C94/C94M for each load of concrete delivered to site. Include on the tickets the additional information specified in the ASTM document.

G. Test Reports: Submit report for each test or series of tests specified.

H. Manufacturer's Installation Instructions: For concrete accessories, indicate installation procedures and interface required with adjacent construction.

I. Sustainable Design Submittals: If any wood or wood-based form materials, including supports, are permanently installed in the project, submit documentation required for sustainably harvested wood as specified in Section 01 60 00 - Product Requirements.

J. Sustainable Design Submittal: Environmental Product Declaration (EPD) Type III, ISO 14025.

K. Sustainable Design Submittal: If any fly ash, ground granulated blast furnace slag, silica fume, rice hull ash, or other waste material is used in mix designs to replace Portland cement, submit the total volume of concrete cast in place, mix design(s) used showing the quantity of portland cement replaced, reports showing successful cylinder testing, and temperature on day of pour if cold weather mix is used.

L. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.

M. Warranty: Submit manufacturer warranty and ensure forms have been completed in District's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Perform work of this section in accordance with ACI SPEC-301 and ACI CODE-318.

1. Maintain one copy of each document on site.

B. Follow recommendations of ACI PRC-305(305R) when concreting during hot weather.

C. Follow recommendations of ACI PRC-306(306R) when concreting during cold weather.

D. For slabs required to include moisture vapor reducing admixture (MVRA), do not proceed with placement unless manufacturer's representative is present for every day of placement.

E. For slabs indicated to receive membrane-forming, moisture emission-reducing, curing and sealing compound, do not proceed with application unless manufacturer's representative is present for every day of placement.

F. Regulatory Requirements:

1. Conform to California Building Code (CBC) Chapter 19A requirement, as amended and adopted by authorities having jurisdiction.

2. Chemical products field-applied to concrete shall comply with applicable air quality requirements of authorities having jurisdiction.

a. Comply with Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions, CALGreen Section 5.504.4 Finish material pollutant control; 5.504.4.1 Adhesives, sealants and caulks; 5.504.4.3 Paints and coatings.

b. Comply with CALGreen Section A5.405.4 Recycled content.

c. Comply with CALGreen Section A5.406 Enhanced Durability and Reduced Maintenance.

G. Testing Agency Services: District will engage an independent testing and inspection agency to conduct tests and perform other services specified for quality control during construction, as required by Section(s) 01 40 00 - Quality Requirements and 01 45 33 - Code-Required Special Inspections and Procedures.

H. Coordination: Coordinate the placement of joint devices with erection of concrete formwork and placement of form accessories. Coordinate concrete requirements with Work specified for underground utilities and mechanical and electrical equipment pads and bases.

1.06 MOCK-UPS

A. Construct and erect mock-up panel for architectural concrete surfaces indicated to receive special treatment or finish as result of formwork.

1. Panel Size: Sufficient to illustrate full range of treatment.

2. Number of Panels: Two.

3. Locate as indicated on drawings.

B. Accepted mock-up panel is considered basis of quality for the finished work. Keep mock-up exposed to view for duration of concrete work.

C. Mock-up may not remain as part of the Work.

1.07 DELIVERY AND HANDLING

A. Protection During Concrete Placement: Provide protective coverings and runways, and use appropriate equipment and means of access to Work areas to avoid soiling or damage to existing conditions.

B. Runoff: Prevent run off of water contaminated by construction agents and chemicals from soiling existing surfaces and from contaminating existing and future landscape areas.

1.08 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Slabs with Porosity Inhibiting Admixture (PIA) or Moisture Vapor Reducing Admixture (MVRA): Provide warranty to cover cost of flooring failures due to moisture migration from slabs for life of the concrete.

1. Include cost of repair or removal of failed flooring, placement of topical moisture remediation system, and replacement of flooring with comparable flooring system.
2. Provide warranty by admixture manufacturer matching terms of flooring adhesive or primer manufacturer's material defect warranty.

C. Moisture Emission-Reducing Curing and Sealing Compound, Membrane-Forming: Provide warranty to cover cost of flooring delamination failures for 10 years.

1. Include cost of repair or removal of failed flooring, remediation with a moisture vapor impermeable surface coating, and replacement of flooring with comparable flooring system.
2. Provide warranty by manufacturer of MVRA matching terms of flooring adhesive or primer manufacturer's material defect warranty.

D. Moisture Emission-Reducing Curing and Sealing Compound, Penetrating: Provide non-prorated warranty to cover cost of flooring delamination failures for 20 years.

1. Include cost of repair or removal of failed flooring, remediation with a moisture vapor impermeable surface coating, and replacement of flooring with comparable flooring system.
2. See Section 09 05 61 - Common Work Results for Flooring Preparation.

PART 2 PRODUCTS

2.01 FORMWORK

A. Comply with requirements of Section 03 10 00.

2.02 REINFORCEMENT MATERIALS

A. Comply with requirements of Section 03 20 00.

2.03 CONCRETE MATERIALS

A. Cement: ASTM C150/C150M, Type II - Moderate Portland type.
   1. Cement used in contact with soil shall be Type V - Sulfate Resistant.
   2. Acquire cement for entire project from same source.

B. Fine and Coarse Aggregates: ASTM C33/C33M.
   1. Acquire aggregates for entire project from same source.
   2. Fine and coarse aggregates, CBC Title 24, Part 2, 1903A, ACI CODE-318 Section 26.4.
   3. Other than Structural Concrete: Conform to requirements for structural concrete.

C. Fly ash and raw or calcined natural pozzolans to conform to ASTM C618 for Class N or F (Class C fly ash is not permitted). Per ASTM C618, sampling and testing of fly ash in accordance with ASTM C111/C111M.
   1. Conform to ACI CODE-318 Section 26.4.2.2 for the use of fly ash or natural pozzolan.
   2. Fly Ash: ASTM C618, Class N or F.
      a. Supply fly ash by an experienced producer that complies with all applicable standards above.
      b. Provide fly ash from one source for the duration of the project, unless additional physical testing of the changed mix is performed; per Concrete Mix Design.
   3. Calcined Pozzolan: ASTM C618, Class N.

D. Silica Fume: ASTM C1240, proportioned in accordance with ACI PRC-211.1.

E. Water: ASTM C1602/C1602M; clean, potable, and not detrimental to concrete.

2.04 ADMIXTURES

A. The use of any chemical admixture is subject to prior approval by DSA.

B. Use no admixtures not included in mix design. Products of the following manufacturers are specified and will be acceptable provided they comply with referenced standards all other requirements of the Contract Documents:

C. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.

D. Water Reducing and Accelerating Admixture: ASTM C494/C494M Type E.
   1. Products:
      a. Euclid Chemical Company; ACCELGUARD 80: www.euclidchemical.com/#sle.
      b. Or Equal Substitutions: See Section 01 60 00 - Product Requirements.

E. Water Reducing and Retarding Admixture: ASTM C494/C494M Type D.
   1. Provide pigmented type, with ASTM C979/C979M inorganic pigments.

F. Water Reducing Admixture: ASTM C494/C494M Type A.
   1. Products:
      a. Euclid Chemical Company; EUCON NW: www.euclidchemical.com/#sle.
      b. Or Equal Substitutions: See Section 01 60 00 - Product Requirements.

G. Moisture Vapor Reducing Admixture (MVRA): Liquid, inorganic admixture free of volatile organic compounds (VOCs). Closes capillary systems formed during concrete curing to reduce moisture vapor emission and transmission. Reduces concrete shrinkage with no adverse effect on concrete properties or applied flooring.

1. Provide admixture in slabs to receive adhesively applied flooring or roofing.
2. Provide admixture in concrete for elevator pits, retaining walls, water-retaining structures, underground structures, roads, dams, and bridges.
3. VOC Content: Zero.
4. Installed admixture to meet or exceed Modified ASTM F1869 or ASTM F2170 testing to performance of moisture vapor emission rate (MVER) of 4 lbs/1,000 ft2/24 hours or lower.
    a. Alternative test methods shall be acceptable to the finish flooring manufacturer and installer.
5. The concrete ready mix supplier must coordinate with the admixture manufacturer before designing and testing any new mix designs, to receive guidance on achieving proper water absorption characteristics.
6. Products:
    a. AVECS, LLC: www.avecs.build/#sle.
    b. Barrier One Concrete Admixtures; MVRA-CPS: www.barrierone.com/#sle.
    c. Hycrete, Inc: www.hycrete.com/#sle.
    d. ISE Logik Industries, Inc; MVRA 900: www.iselogik.com/#sle.
    e. Specialty Products Group; Vapor Lock 20/20: www.spggogreen.com/#sle.
    f. Or Equal Substitutions: See Section 01 60 00 - Product Requirements.

H. Waterproofing Admixture: Admixture formulated to reduce permeability to liquid water, with no adverse effect on concrete properties.

1. Admixture Composition: Crystalline, functioning by growth of crystals in capillary pores.
2. Potable Water Contact Approval: National Science Foundation (NSF) certification for use on structures holding potable water, based on testing in accordance with NSF 61 and NSF 372
3. Products:
    a. Basis of Design Product: Xypex Admix C-500/C-500NF as manufactured by Xypex Chemical Corporation, or equal.
    b. Aquafin, Inc: www.aquafin.net/#sle.
    c. Euclid Chemical Company; Eucon Vandex AM-10: www.euclidchemical.com/#sle.
    d. Master Builders Solutions; MasterLife 300: www.master-builders-solutions.com/en-us/#sle.
    e. Penetron; PENETRON ADMIX SB: www.penetron.com/#sle.
    f. Specialty Products Group; Vapor Lock 20/21: www.spggogreen.com/#sle.
    g. W. R. Meadows, Inc; ADI-CON CW Plus: www.wrmeadows.com/#sle.

h. Substitutions: See Section 01 60 00 - Product Requirements.

2.05 ACCESSORY MATERIALS

A. Underslab Vapor Retarder:

1. Sheet Material: ASTM E1745, Class A; stated by manufacturer as suitable for installation in contact with soil or granular fill under concrete slabs. Single-ply polyethylene is prohibited.
2. Performance Requirements:
   a. Comply with ACI PRC-302.1 and ACI PRC-302.2.
   b. Water Vapor Permeance: Not more than 0.010 perms, maximum.
      1) Permeance as tested after conditioning (ASTM E1745).
   c. Comply with ASTM E1745 Class A.
   d. Puncture Resistance, ASTM D1709: 2,300 gms.
3. Accessory Products: Vapor retarder manufacturer's recommended tape, adhesive, mastic, prefabricated boots, etc., for sealing seams and penetrations.
4. Products:
   a. Henry, a Carlisle Company; Moistop Ultra 15: www.henry.com/#sle.
   b. ISI Building Products; Viper VaporCheck II 15-mil (Class A): www.isibp.com/#sle.
   c. Raven Industries; VaporBlock VB15, 15 mils thick (0.01 perms), Class A, unreinforced polyolefin: ravenefd.com,
   d. Reef Industries, Inc.; Vaporguard, 15 mil (E-96 0.000 perms), Class B: www.reefindustries.com
   e. Stego Industries, LLC; Stego Wrap Vapor Barrier, 15 mils:: www.stegoindustries.com/#sle.
   f. W. R. Meadows, Inc; PERMINATOR Class A - 15 mils (0.38 mm): www.wrmeadows.com/#sle.
   g. Substitutions: See Section 01 60 00 - Product Requirements.

B. Non-Shrink Cementitious Grout: Premixed compound consisting of nonmetallic aggregate, cement, water reducing and plasticizing agents.

1. Grout: Comply with ASTM C1107/C1107M.
2. Height Change, Plastic State; when tested in accordance with ASTM C827/C827M:
   a. Maximum: Plus 4 percent.
   b. Minimum: Plus 1 percent.
3. Minimum Compressive Strength at 48 Hours: 2,000 pounds per square inch.
4. Minimum Compressive Strength at 28 Days: 8,000 pounds per square inch.
5. Products containing aluminum powder are not permitted.
6. Flowable Products:
   a. Dayton Superior Corporation: www.daytonsuperior.com/#sle.

b. LATICRETE International, Inc; DURAGROUT: www.laticrete.com/#sle.

c. SpecChem, LLC; SC Precision Grout: www.specchemllc.com/#sle.

d. W. R. Meadows, Inc; 588-10K: www.wrmeadows.com/#sle.

e. Substitutions: See Section 01 60 00 - Product Requirements.

7. Low-Slump, Dry Pack Products:

a. Dayton Superior Corporation: www.daytonsuperior.com/#sle.

b. Or Equal Substitutions: See Section 01 60 00 - Product Requirements.

C. Non-Shrink Epoxy Grout: Moisture-insensitive, two-part; consisting of epoxy resin, nonmetallic aggregate, and activator.

1. Composition: High solids content material exhibiting positive expansion when tested in accordance with ASTM C827/C827M.

a. Maximum Height Change: Plus 4 percent.

b. Minimum Height Change: Plus 1 percent.

2. Minimum Compressive Strength at 7 days, ASTM C579: 12,000 pounds per square inch.

3. Minimum Compressive Strength at 7 days, ASTM D695: 12,000 pounds per square inch.

4. Products:

a. Euclid Chemical Company; E3-DEEP POUR: www.euclidchemical.com/#sle.

b. Dayton Superior Corporation; SURE-GRIP High Performance (HP): www.daytonsuperior.com/#sle.

c. Five Star Products, Inc; Five Star DP Epoxy Grout: www.fivestarproducts.com/#sle.

d. W. R. Meadows, Inc; REZI-WELD 3/2: www.wrmeadows.com/#sle.

e. Or Equal Substitutions: See Section 01 60 00 - Product Requirements.

2.06 BONDING AND JOINTING PRODUCTS

A. Latex Bonding Agent: Non-redispersable acrylic latex, complying with ASTM C1059/C1059M, Type II.

1. Products:

a. Euclid Chemical Company; AKKRO-7T: www.euclidchemical.com/#sle.

b. SpecChem, LLC; Strong Bond Acrylic Bonder: www.specchemllc.com/#sle.

c. W. R. Meadows, Inc; ACRY-LOK: www.wrmeadows.com/#sle.

d. Or Equal Substitutions: See Section 01 60 00 - Product Requirements.

B. Epoxy Bonding System:

1. Complying with ASTM C881/C881M and of Type required for specific application.

2. Products:

a. Convergent Concrete Technologies; CRACKBOND 2100 MV: www.atcepoxy.com/#sle.

b. Euclid Chemical Company; DURAL FAST SET LV: www.euclidchemical.com/#sle.

c. Euclid Chemical Company; DURALFLEX GEL: www.euclidchemical.com/#sle.

d. Euclid Chemical Company; DURALFLEX LV: www.euclidchemical.com/#sle.

e. Euclid Chemical Company; DURAL 452 GEL, DURAL 452 LV, or DURAL 452 MV: www.euclidchemical.com/#sle.

f. Dayton Superior Corporation: www.daytonsuperior.com/#sle.

g. Mapei Corporation; Planibond AE: www.mapei.com/#sle.

h. Mapei Corporation; Planibond 3C: www.mapei.com/#sle.

i. SpecChem, LLC; SpecPoxy 1000, SpecPoxy 2000, SpecPoxy 3000, or SpecPoxy 3000FS: www.specchemllc.com/#sle.

j. W. R. Meadows, Inc; Rezi-Weld Gel Paste, Rezi-Weld Gel Paste State, Rezi-Weld 1000: www.wrmeadows.com/#sle.

k. Or Equal Substitutions: See Section 01 60 00 - Product Requirements.

C. Waterproofing Admixture Slurry: Slurry coat of Portland cement, sand, and crystalline waterproofing additive, mixed with water in proportions recommended by manufacturer to achieve waterproofing at cold joints in concrete.

1. Products:

a. Aquafin, Inc: www.aquafin.net/#sle.

b. W. R. Meadows, Inc; ADI-CON CW Plus: www.wrmeadows.com/#sle.

c. Xypex Chemical Corporation; Xypex Concentrate: www.xypex.com/#sle.

d. Substitutions: See Section 01 60 00 - Product Requirements.

D. Waterstops: Bentonite and butyl rubber.

1. Configuration: As indicated on drawings.

2. Size: As indicated on drawings.

3. Products:

a. Tremco; Superstop Waterstop: www.tremco.com.

b. Substitutions: See Section 01 60 00 - Product Requirements.

E. Waterstops: Synthetic rubber; swells to 800 percent of original size in clean water.

1. Configuration: As indicated on drawings.

2. Size: As indicated on drawings.

3. Products:

a. GCP Applied Technologies; Adcor; www.gcpat.com

b. Kryton International, Inc; Krytonite Swelling Waterstop: www.kryton.com/#sle.

c. Sika - Hyrdrotite CJ: usa.sika.com.

d. Or Equal Substitutions: See Section 01 60 00 - Product Requirements.

F. Slab Isolation Joint Filler: 1/2-inch thick, height equal to slab thickness, with removable top section forming 1/2-inch deep sealant pocket after removal.

1. Material: Closed-cell, non-absorbent, compressible polymer foam in sheet form.

2. Products:

a. W. R. Meadows, Inc; Deck-O-Foam Joint Filler with pre-scored top strip: www.wrmeadows.com/#sle.

b. W. R. Meadows, Inc; X-Foam: www.wrmeadows.com/#sle.

c. Or Equal Substitutions: See Section 01 60 00 - Product Requirements.

G. Slab Contraction Joint Device: Preformed linear strip intended for pressing into wet concrete to provide straight route for shrinkage cracking.

1. Products:

a. W. R. Meadows, Inc; Speed-E-Joint: www.wrmeadows.com/#sle.

b. Or Equal Substitutions: See Section 01 60 00 - Product Requirements.

H. Slab Construction Joint Devices: Combination keyed joint form and screed, galvanized steel, with rectangular or round knockout holes for conduit or rebar to pass through joint form at 6 inches on center; ribbed steel stakes for setting.

1. Provide removable plastic cap strip that forms wedge-shaped joint for sealant installation.

2. Height: To suit slab thickness.

I. Dowel Sleeves: Plastic sleeve for smooth, round, steel load-transfer dowels.

2.07 CURING MATERIALS

A. Evaporation Reducer: Liquid thin-film-forming compound that reduces rapid moisture loss caused by high temperature, low humidity, and high winds; intended for application immediately after concrete placement.

1. Products:

a. Dayton Superior Corporation: www.daytonsuperior.com/#sle.

b. Euclid Chemical Company ; EUCOBAR: www.euclidchemical.com/#sle.

c. Nox-Crete Inc; Monofilm: www.nox-crete.com/#sle.

d. SpecChem, LLC; SpecFilm Concentrate or SpecFilm: www.specchemllc.com/#sle.

e. W. R. Meadows, Inc; Evapre or Evapre-RTU: www.wrmeadows.com/#sle.

f. Or Equal Substitutions: See Section 01 60 00 - Product Requirements.

B. Curing and Sealing Compound, Moisture Emission-Reducing, Membrane-Forming: Clear, liquid sealer for application to newly-placed concrete; capable of providing adequate bond for flooring adhesives, initially and over the long term; with sufficient moisture vapor impermeability to prevent deterioration of flooring adhesives due to moisture emission.

1. CONC-2.

2. Comply with ASTM C309 and ASTM C1315 Type I Class A.

3. VOC Content: Less than 100 g/L.

4. Solids Content: 25 percent, minimum.

5. Products:

a. Floor Seal Technology, Inc; VaporSeal 309: www.floorseal.com/#sle.

b. Or Equal Substitutions: See Section 01 60 00 - Product Requirements.

C. Curing and Sealing Compound, High Gloss: Liquid, membrane-forming, clear, nonyellowing acrylic; complying with ASTM C1315 Type 1 Class A.
   1. Vehicle: Water-based.
   2. Solids by Mass: 25 percent, minimum.
   3. VOC Content: Ozone Transport Commission (OTC) compliant.
   4. Products:
      a. LATICRETE International, Inc; LUMISEAL FX: www.laticrete.com/#sle.
      b. Mapei Corporation; Mapecure UV WB: www.mapei.com/#sle.
      c. W. R. Meadows, Inc; VOCOMP-30: www.wrmeadows.com/#sle.
      d. Substitutions: See Section 01 60 00 - Product Requirements.

D. Moisture-Retaining Sheet: ASTM C171.
   1. Curing paper, regular.
   2. Polyethylene film, white opaque, minimum nominal thickness of 4 mil, 0.004 inch.

E. Polyethylene Film: ASTM D2103, 4 mil, 0.004 inch thick, clear.

F. Water: Potable, not detrimental to concrete. ASTM C1602/C1602M per ACI CODE-318 Sec. 26.4.3.1

2.08 CONCRETE MIX DESIGN

A. Proportioning Normal Weight Concrete: Comply with ACI PRC-211.1 recommendations and ACI CODE-318.
   1. Replace as much Portland cement as possible with fly ash, ground granulated blast furnace slag, silica fume, or rice hull ash as is consistent with ACI recommendation.

B. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI SPEC-301.
   1. For trial mixtures method, employ independent testing agency acceptable to Architect for preparing and reporting proposed mix designs.

C. Admixtures: Add acceptable admixtures as recommended in ACI PRC-211.1 and at rates recommended or required by manufacturer.

D. Normal Weight Concrete:
   1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: 4,000 pounds per square inch, unless noted otherwise.
   2. Fly Ash Content: Maximum 15 percent of cementitious materials by weight.
   3. Calcined Pozzolan Content: Maximum 10 percent of cementitious materials by weight.
   4. Silica Fume Content: Maximum 5 percent of cementitious materials by weight.
   5. Water-Cement Ratio: Maximum w/c = 50 percent by weight, unless noted otherwise.
   6. Maximum Slump: As indicated on Drawings.
      a. 4 inches prior to adding water-reducing admixtures or super-plasticizers.
      b. 6 inches 6" for mixes including admixtures or super-plasticizers.

7. Maximum Aggregate Size: .
    a. Structural Concrete: Maximum size not larger than 1/5 of narrowest dimension between forms, 1/3 depth of slab nor 3/4 of minimum clear spacing between individual reinforcing bars.
    b. Other than Structural Concrete: Conform to requirements for structural concrete.

2.09 MIXING

A. Transit Mixers: Comply with ASTM C94/C94M.

B. Adding Water: If concrete arrives on-site with slump less than suitable for placement, do not add water that exceeds the maximum water-cement ratio or exceeds the maximum permissible slump.

C. Do not use shrinkage-reducing admixture (SRA) in same concrete batch with MVRA or PIA.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify lines, levels, and dimensions before proceeding with work of this section.

B. Layout construction and control joints according to the drawing details and plans following these guidelines:
    1. Finished exposed concrete floors are critical for aesthetics.
    2. Layout joints on exposed concrete floors to allow for installation of utilities without sawcutting or concrete placement of different production batches subject to different colors. Staining and integral color concrete is not exempt from this requirement.
    3. Architect to review joint pattern submittal each floor.
    4. No lengthwise joints in corridors; place cross-corridor, if required.
    5. Place joint at 90 degree wall corners.
    6. Place joints at center line of columns.
    7. Equally space all joints.

C. Verify that concrete cover requirements are met in formwork construction and reinforcement placement.

D. Examine areas to receive reinforced vapor retarders. Notify Architect if areas are not acceptable. Do not begin installation until unacceptable conditions have been corrected.

E. Subbase: Per ACI PRC-302.1.
    1. As indicated on Drawings and approved by the Geotechnical Engineer.
        a. Minimum 4 inch thick (or larger) base of 1/2 inch or larger clean aggregate, per CA Green Code 4.505.2.1 and CBC 1907A.1.

F. Verify that base material (sand, gravel or natural as specified or indicated on Drawings) level, vapor barrier/retarder properly placed and that required clearances to reinforcing steel have been maintained.

G. Verify that all embedded products and formed openings and recesses are correctly placed.

H. At slabs on grade, verify that vapor retarder/barrier is properly placed and free of damage.

3.02 PREPARATION

A. Verify that forms are clean and free of rust before applying release agent.

B. Prepare previously placed concrete by cleaning with hydro-blasting or wet sand blasting to provide suitable surface for bonding. Provide minimum aggregate exposure of 1/4 inch.

C. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.

D. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning and applying bonding agent in according to bonding agent manufacturer's instructions.

1. Use epoxy bonding system for bonding to damp surfaces, for structural load-bearing applications, and where curing under humid conditions is required.
2. Use latex bonding agent only for non-load-bearing applications.

E. Where new concrete with integral waterproofing is to be bonded to previously placed concrete, prepare surfaces to be treated in accordance with waterproofing manufacturer's instructions. Saturate cold joint surface with clean water, and remove excess water before application of coat of waterproofing admixture slurry. Apply slurry coat uniformly with semi-stiff bristle brush at rate recommended by waterproofing manufacturer.

F. Interior Slabs on Grade: Install vapor retarder under interior slabs on grade. Comply with ASTM E1643. Lap joints minimum 6 inches. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions. Repair damaged vapor retarder before covering.

1. Vapor Retarder Over Granular Fill: Install compactible granular fill before placing vapor retarder as indicated on drawings. Do not use sand.
    a. Install total thickness indicated on Drawings. Provide crushed rock, 1/2 inch grading, clean washed, complying with ASTM C33/C33M.
    b. Minimum 4 inch thick (or larger) base of 1/2 inch or larger clean aggregate, per CA Green Code 4.505.2.1 and CBC 1907A.1.
    c. Seam and Lap Sealing: With adhesive mastic and adhesive sealing tape, seal all seams, edges and penetrations of vapor retarder/barrier.
        1) For adhesive mastic seal, apply adhesive to both surfaces, allow approximately 10 minutes to set up and then press together smoothly and evenly, without gaps or fishmouths, for full contact bond.
        2) For adhesive tape seal, comply with manufacturer's instructions and recommendations.
        3) Seal all penetrations with both adhesive sealing tape and adhesive mastic.
        4) Seal sheets to concrete footing faces and penetrating components with adhesive mastic or double sided tape as recommended by membrane manufacturer.

2. Repair underslab vapor retarder damaged during placement of concrete reinforcing. Repair with vapor retarder material; lap over damaged areas minimum 6 inches and seal watertight.

3.03 CONCRETE MIXING

A. Concrete Mixing, General: Comply with ACI CODE-318 as adopted by CBC, Title 24, Part 2, Chapter 19A and ACI PRC-304 - Guide for Measuring, Mixing, Transporting, and Placing Concrete. Introduce and mix admixtures in compliance with manufacturer's instructions and recommendations.

3.04 PLACING CONCRETE

A. Notify District's Inspector and at least 2 working days in advance of placing concrete.

B. Place concrete in accordance with ACI PRC-304.

1. General: Comply with ACI CODE-318, as adopted by CBC, Title 24, Part 2, Chapter19A and as follows:

a. Schedule continuous placement of concrete to prevent the formation of cold joints.

b. Deliver ready mix concrete in accordance with ASTM C94/C94M. Place concrete within 90 minutes after start of mixing.

c. Provide construction joints if concrete for a particular element or component cannot be placed in a continuous operation.

1) Submit for review, proposed locations of joints prior to pouring. See Structural Drawings for additional requirements.

d. Deposit concrete as close as possible to its final location, to avoid segregation.

2. Placement in Forms: Limit horizontal layers to depths which can be properly consolidated, but in no event greater than 24 inches.

a. Consolidate concrete by means of mechanical vibrators, inserted vertically in freshly placed concrete in a systematic pattern at close intervals. Penetrate previously placed concrete to ensure that separate concrete layers are knitted together.

b. Vibrate concrete sufficiently to achieve consistent consolidation without segregation of coarse aggregates.

c. Do not use vibrators to move concrete laterally.

C. Hot Weather Placement: Comply with recommendations of ACI PRC-305 when ambient temperature before, during, or after concrete placement is expected to exceed 90 deg F or when combinations of high air temperature, low relative humidity, and wind speed are such that the rate of evaporation from freshly poured concrete would otherwise exceed 0.2 lbs./SF/Hr..

1. Use evaporation reducer.

2. Do not add water to approved concrete mixes under any conditions.

3. Provide mixing water at lowest feasible temperature, and provide adequate protection of poured concrete to reduce rate of evaporation.

4. Use fog nozzle to cool formwork and reinforcing steel immediately prior to placing concrete.

D. Cold-Weather Placement: Comply with provisions of ACI PRC-306 when air temperature has fallen to or is expected to fall below 40 deg F. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

1. Uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise accepted in mix designs.

E. Place concrete for floor slabs in accordance with ACI PRC-302.1.

1. Schedule continuous placement and consolidation of concrete within planned construction joints.
2. Place concrete in linear pattern, with control joints at slab on grade conditions only, with joints located as indicated on the Drawings.
3. Thoroughly consolidate concrete without displacing reinforcement or embedded items, using internal vibrators, vibrating screeds, roller pipe screeds or vibrating laser screed as described below.
4. Screeding Procedures: Strike off and level concrete slab surfaces before bleed water can collect on surface. Do not work concrete further until finishing operations are commenced.
    a. Typical Slabs: Strike off and level surface using highway straight edges, darbies or bull floats.
    b. Create control and construction joints true to line and profile. Do not radius the joints. Refer to the Drawings for structural requirements of joints.
    c. Locate joints as indicated on the Drawings but in no case shall joint spacing exceed 15 feet or 36 times the slab thickness in both directions and maximum area between joints shall not exceed 200 square feet. Locate joints on column centers and at re-entrant corners where possible.
    d. Sawcut control joints to one-quarter of slab depth, immediately after slab has achieved initial set and not longer than 8 hours. "Soff-Cut" method is preferred.
    e. Alternate control and construction joint products and procedures will be considered in accordance with substitution provision specified in Section 01 60 00 - Product Requirements.

F. Notify Architect not less than 24 hours prior to commencement of placement operations.

G. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.

H. Ensure reinforcement, inserts, and waterstops will not be disturbed during concrete placement.

I. Place concrete continuously without construction (cold) joints wherever possible; where construction joints are necessary, before next placement prepare joint surface by removing laitance and exposing the sand and sound surface mortar, by sandblasting or high-pressure water jetting.

J. Finish floors level and flat, unless otherwise indicated, within the tolerances specified below.

3.05 SLAB JOINTING

A. Locate joints as indicated on drawings.

1. Place joint filler in floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.

B. Anchor joint fillers and devices to prevent movement during concrete placement.

1. Extend joint filler from bottom of slab to within 1/2 inch of finished slab surface. Conform to Section 07 92 00 for finish joint sealer requirements.

C. Isolation Joints: Use preformed joint filler with removable top section for joint sealant, total height equal to thickness of slab, set flush with top of slab.

1. Install where indicated and required on Structural Drawings, to separate slab from other building members, including columns, walls, equipment foundations, footings, stairs, manholes, sumps, and drains.

2. Separate slabs on grade from vertical surfaces with joint filler.

3. Isolation Joints in Slabs-on-Grade: Construct isolation joints in slabs-on-grade at points of contact between slabs-on-grade and vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, or as indicated.

a. Structural slab contact at foundation walls and grade beams shall be doweled as detailed.

D. Load Transfer Construction and Contraction Joints: Install load transfer devices as indicated; saw cut joint at surface as indicated for contraction joints.

E. Saw Cut Contraction Joints: Saw cut joints before concrete begins to cool, within 4 to 8 hours after placing; use 1/4 inch thick blade and cut at least 1 inch deep but not less than one quarter (1/4) the depth of the slab.

F. Construction Joints: Where not otherwise indicated, use metal combination screed and key form, with removable top section for joint sealant.

3.06 FLOOR FLATNESS AND LEVELNESS TOLERANCES

A. An independent testing agency, as specified in Section 01 40 00, will inspect finished slabs for compliance with specified tolerances.

B. Maximum Variation of Surface Flatness:

1. Exposed Concrete Floors: 1/4 inch in 10 feet.

2. Under Seamless Resilient Flooring: 1/8 inch in 10 feet.

3. Under Carpeting: 1/4 inch in 10 feet.

C. For the following applications, depressions in slab floors between high spots shall be a maximum 1/8 inch in 10 ft., using a metal straight edge placed at any location on slab, and measured within 72 hours of pour.

1. Additional floor finishes may require similar tolerances that are not noted here. Refer to individual sections for their requirements.

D. Curbs:

1. Top of Curb: 1/4 inch in 10 ft, non-cumulative.
2. Side of Curb: 1/8 inch in 10 ft, non-cumulative, vertical and horizontal.

E. Correct the slab surface if tolerances are less than specified.

F. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

3.07 CONCRETE FINISHING

A. Repair surface defects, immediately after removing formwork.

1. Remove honeycombed areas and other defective concrete down to sound concrete, cutting perpendicular to surface or slightly undercutting without damaging reinforcement. Dampen patch location and area immediately surrounding it prior to applying bonding compound or patching mortar.
2. Before bonding compound has dried, apply patching mixture matching original concrete in materials and mix except for omission of coarse aggregate, and using a blend of white and normal portland cement as necessary to achieve color match. Consolidate thoroughly and strike off slightly higher than surrounding surface.

B. Exposed Form Finish: Rub down or chip off and smooth fins or other raised areas 1/4 inch or more in height. Provide finish as follows:

1. Grout Cleaned Finish: Wet areas to be cleaned and apply grout mixture by brush or spray; scrub immediately to remove excess grout. After drying, rub vigorously with clean burlap, and keep moist for 36 hours.

C. Concrete Slabs: Finish to requirements of ACI PRC-302.1 and as follows:

1. Surfaces to Receive Thin Floor Coverings: "Steel trowel" as described in ACI PRC-302.1; thin floor coverings include resilient flooring.
2. Other Surfaces to Be Left Exposed: Trowel as described in ACI PRC-302.1, minimizing burnish marks and other appearance defects.

3.08 CURING AND PROTECTION

A. Comply with requirements of ACI PRC-308. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

1. Normal concrete: Not less than seven days.

C. Formed Surfaces: Cure by moist curing with forms in place for full curing period.

D. Surfaces Not in Contact with Forms:

1. Slabs and Floors To Receive Adhesive-Applied Flooring: Curing compounds and other surface coatings are usually considered unacceptable by flooring and adhesive manufacturers. If such materials must be used, either obtain the approval of the flooring and adhesive manufacturers prior to use or remove the surface coating after curing to flooring manufacturer's satisfaction.
2. Initial Curing: Start as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than three days by water ponding, water-saturated sand, water-fog spray, or saturated burlap.
    a. Spraying: Spray water over floor slab areas and maintain wet.
    b. Saturated Burlap: Saturate burlap-polyethylene and place burlap-side down over floor slab areas, lapping ends and sides; maintain in place.
3. Final Curing: Begin after initial curing but before surface is dry.
    a. Moisture-Retaining Sheet: Lap strips not less than 3 inches and seal with waterproof tape or adhesive; secure at edges.
    b. Curing Compound: Apply in two coats at right angles, using application rate recommended by manufacturer.

3.09 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures for passage of Work specified in other Sections, after such Work is in place. Mix, place, and cure concrete as specified to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete Work. Us non-shrink grout where required or indicated.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Equipment 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 diagrams or templates of manufacturer furnishing machines and equipment.

3.10 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00 - Quality Requirements.

B. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.

C. Provide free access to concrete operations at project site and cooperate with appointed firm.

D. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.

E. Field Certifications: For all concrete, provide signed copy of batch plant's certificate stating quantity of each material, amount of water, admixtures, departure time and date accompanying each load of materials or concrete.

F. Field Tests of Concrete: Perform tests in accordance with applicable California Building Code requirements, ACI SPEC-301 and requirements of authorities having jurisdiction.

G. Tests of concrete and concrete materials may be performed at any time to ensure compliance with specified requirements.

H. Compressive Strength Tests: ACI CODE-318, 26.12.2.1(a), ASTM C39/C39M, for each test, mold and cure a minimum of four concrete test cylinders. Project Inspector to obtain test samples each day, for every 50 cubic yards, 2,000 sq. ft. of slab or wall surface area, or less of each class of concrete placed.

1. Take additional samples for 7-day compressive strength tests for of each class of concrete at the beginning of of concrete work or whenever the mix or aggregate is changed.
2. Test one cylinder at 7 days and two at 28 days after placement.
3. Maintain fourth cylinder to be tested at 56 days only if 28-day test fails to meet strength requirement.
4. Take one additional test cylinder during cold weather concreting and cure it at job site under same conditions as concrete it represents. Test cold weather cylinder at 28 days.
5. Comply with ACI CODE-318, 26.12.3 Acceptance Criteria for Standard-Cured Specimens.
    a. Strength level of a concrete mixture shall be acceptable if (1) and (2) are satisfied:
        1) Every average of any three consecutive strength tests equals or exceeds fc'.
        2) No strength test falls below fc' by more than 500 psi if fc' is 5000 psi or less; or by more than 0.10fc' if fc' exceeds 5000 psi.
    b. If either of the requirements of 26.12.3.1(a) is not satisfied, steps shall be taken to increase subsequent strength tests.
    c. Requirements of 26.12.6 for investigating strength tests shall apply if the requirements of 26.12.3.1(a)(2) are not met.

I. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.

J. Perform one slump test for each set of test cylinders taken, following procedures of ASTM C143/C143M.

K. Slab Testing: Cooperate with manufacturer of specified moisture vapor reducing admixture (MVRA) to allow access for sampling and testing concrete for compliance with warranty requirements.

3.11 SPECIAL INSPECTIONS FOR CONCRETE CONSTRUCTION (CHAPTER 17A AND 19A)

A. Inspection:

1. Job Site Inspection: CBC 1705A.3, 1705A.3.5 (Conc. Preplacement), 1705A.3.6 (Placing Record).
2. Batch Plant or Weighmaster Inspection: CBC 1705.3.3.
    a. Continuous or Periodic Batch Plant Inspection per DSA IR 17-13

B. Reinforcing Steel, Including: Verify compliance with approved contract documents and ACI CODE-318, Sections 20.2, 25.2 through 25.7, and 26.6.

1. Reinforcing Bars: CBC 1901A.6; 1910A.2.
2. Tests:
    a. Tests shall be performed before the delivery of steel to Project site. Steel not meeting specifications shall not be shipped to the Project.
    b. Testing procedure shall conform to ASTM A615/A615M or ASTM A706/A706M.
    c. Sample at the place of distribution, before shipment:
        1) Make one tensile test and one bending test from samples out of 10 tons, or fraction thereof, of each size and kind of reinforcing steel, where taken from bundles as delivered from the mill and properly identified as to heat number.
        2) Where identification number cannot be ascertained, or where random samples are taken, make one series of tests from each 2-1/2 tons, or fraction thereof, of each size and kind of reinforcing steel.
        3) Samples shall include not fewer than 2 pieces, each 18 inches long, of each size and kind of reinforcing steel.
    d. District's Inspector will inspect all reinforcement for concrete work for size, dimensions, locations and proper placement.

C. Reinforcing Bar Welding: Verify compliance with AWS D1.4/D1.4M and ACI CODE-318, 26.6.4; continuous.
    1. Verify weldability of reinforcing bars other than those complying with ASTM A706/A706M; periodic.
    2. Inspect single-pass fillet welds, maximum 5/16 inch; periodic.
    3. Inspect all other welds; continuous.
    4. Reinforcing Bar Welding Inspection: CBC 1705A.3.1; Table 1705A.3, Item 2; 1903A.5.

D. Anchors Cast in Concrete: Verify compliance with ACI CODE-318; periodic.

E. Bolts Installed in Concrete: Where allowable loads have been increased or where strength design is used, verify compliance with approved Contract Documents and ICC-ES AC308 approved report prior to and during placement of concrete; continuous.
    1. Comply with CBC Section 1910A.5; Table 1705A.3, items 4a & 4b, ASCE 7, Section 13.4.

F. Anchors Post-Installed in Hardened Concrete: Verify compliance with ACI CODE-318.
    1. Comply with CBC Section 1910A.5; Table 1705A.3, items 4a & 4b, ASCE 7, Section 13.4.
    2. Adhesive Anchors: Verify horizontally or upwardly-inclined orientation installations resisting sustained tension loads - Section 17.8.2.4; continuous.
    3. Other Mechanical and Adhesive Anchors: Verify as per Chapter 17.8.2; periodic.

G. Anchors Installed in Hardened Concrete: Verify compliance with ACI CODE-318; periodic.

H. Design Mix: Verify plastic concrete complies with the design mix in approved contract documents and with CBC Chapter 19A, ACI CODE-318, Sections 26.4.3, 26.4.4; periodic.
    1. Proportions of Concrete: CBC 1904A (Durability) and 1905A (Modifications to ACI CODE-318).

I. Concrete Sampling Concurrent with Strength Test Sampling: Each time fresh concrete is sampled for strength tests, verify compliance with ASTM C172/C172M, ASTM C31/C31M, and ACI CODE-318, Chapter 26.5, 26.12, and record the following, continuous:

1. Slump.
2. Air content.
3. Temperature of concrete.
4. Strength Tests of Concrete: CBC 1909A.1.16; Table 1705A.3 Item 6; ACI CODE-318 Sec. 26.12.

J. Concrete Placement: Verify application techniques comply with approved Contract Documents and ACI CODE-318, Chapter 26.5; continuous.

K. Specified Curing Temperature and Techniques: Verify compliance with ACI CODE-318, Chapter 26.5.3-26.5.5; continuous.

L. Formwork Shape, Location and Dimensions: Verify compliance with approved Contract Documents and ACI CODE-318, Chapter 26.11.1.2(b); continuous.

M. Welding of Reinforcing Bars: Conduct special inspections and verify Special Inspector's qualifications in accordance with requirements of AWS D1.4/D1.4M.

3.12 DEFECTIVE CONCRETE

A. Test Results: The testing agency shall report test results in writing to Architect and Contractor within 24 hours of test.

B. Defective Concrete: Concrete not complying with required lines, details, dimensions, tolerances or specified requirements.

C. Repair or replacement of defective concrete will be determined by the Architect. The cost of additional testing shall be borne by Contractor when defective concrete is identified.

1. Obtain repair details from Architect (Structural Engineer) and approved by DSA before proceeding.

D. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect for each individual area.

3.13 PROTECTION

A. Do not permit traffic over unprotected concrete floor surface until fully cured.

B. Protect concrete from marring and damage due to weather and construction activities.

1. Protective measures shall include providing temporary coverings, and be in accordance with Section 01 50 00 - Temporary Facilities and Controls, and shall prohibit all non-essential construction activities, including cleaning and maintenance of construction equipment.
2. In particular, protect concrete floor slabs from oil, paint and other products that might penetrate and degrade concrete surface.

END OF SECTION

SECTION 05 50 00
METAL FABRICATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Shop fabricated steel and aluminum items.
   1. Custom fabricated gate and fence.

B. Requirements for materials and equipment for post-installed mechanical and adhesive anchors in concrete.

C. Pipe bollards.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Placement of metal fabrications in concrete.

B. Section 09 91 13 - Exterior Painting: Paint finish.

C. Divisions 10 - Specialties, 22 - Plumbing, 23 - Heating, Ventilating, and Air-Conditioning (HVAC), 26 - Electrical, and 28 - Electronic Safety and Security: Mounting of equipment and components.

1.03 REFERENCE STANDARDS

A. ACI 318 - Building Code Requirements for Structural Concrete.

B. ACI 355.4 - Qualification of Post-Installed Adhesive Anchors in Concrete.

C. ACI 440.2R - Guide for the Design and Construction of Externally Bonded FRP Systems for Strengthening Concrete Structures.

D. AISC 207 - Standard for Certification Programs.

E. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.

F. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.

G. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

H. ASTM A193/A193M - Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications.

I. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.

J. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.

K. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

L. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.

M. ASTM B26/B26M - Standard Specification for Aluminum-Alloy Sand Castings.

N. ASTM B85/B85M - Standard Specification for Aluminum-Alloy Die Castings.

O. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

P. ASTM B210/B210M - Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes.

Q. ASTM B211/B211M - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire.

R. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

S. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel.

T. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.

U. ASTM E488/E488M - Standard Test Methods for Strength of Anchors in Concrete Elements.

V. ASTM F594 - Standard Specification for Stainless Steel Nuts.

W. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination.

X. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification.

Y. AWS D1.1/D1.1M - Structural Welding Code - Steel.

Z. AWS D1.2/D1.2M - Structural Welding Code - Aluminum.

AA. DSA IR 17-11 - Identification, Sampling and Testing of Threaded Steel Anchor Bolts and Anchor Rods.

BB. DSA IR 22-2 - Anchor Rods (Bolts) Connecting Steel to Concrete.

CC. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel AC172.

DD. SSPC-PA 1 - Shop, Field, and Maintenance Coating of Metals.

EE. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer.

FF. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic).

GG. SSPC-SP 2 - Hand Tool Cleaning.

HH. SSPC-SP 5 - White Metal Blast Cleaning.

II. SSPC-SP 6 - Commercial Blast Cleaning.

JJ. SSPC-SP 10 - Near-White Metal Wet Abrasive Blast Cleaning.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. ICC ES Reports: If requested, ICC Evaluation Service report indicating conformance with ICC-ES Acceptance Criteria.

C. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.

1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.

D. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.

E. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172, AISC 201, or City of Los Angeles Certified Fabricator.

1.05 QUALITY ASSURANCE

A. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and AWS D1.2/D1.2M and dated no more than 12 months before start of scheduled welding work.

B. Fabricator Qualifications: A qualified steel fabricator that is accredited by IAS AC172, AISC 207, or City of Los Angeles Certified Fabricator.

C. Testing Agency Qualifications: An independent agency qualified according to ASTM E329 and Section 01 45 33 for testing indicated.

1. Special Inspector: AWS-CWI qualified inspector approved by DSA for all welding.

D. Installer Training: Prior to beginning the work, manufacturer or manufacturer's representative shall provide on-site training for all contractor's personnel who will be installing anchors.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

A. Conform to applicable requirements of California Building Code (CBC), Title 24, Part 2, as amended and adopted by authorities having jurisdiction.

1. Comply with Title 24, Part 9, California Fire Code Chapter 35 "Welding and Other Hot Work."

2.02 MATERIALS - STEEL

A. Steel Sections: ASTM A36/A36M, for channels, angles and plates.

B. Steel Tubing: ASTM A500/A500M Grade C cold-formed structural tubing.

C. Pipe: ASTM A53/A53M, Grade B Schedule 40, black finish.

D. Slotted Channel Framing: ASTM A653/A653M, Grade 33.

E. Slotted Channel Fittings: ASTM A1011/A1011M.

F. Mechanical Fasteners: Same material as or compatible with materials being fastened; type consistent with design and specified quality level.

G. Bolts, Nuts, and Washers: As indicated on Drawings.

H. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

I. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

1. Comply with SSPC-PA 1. Coordinate with requirements specified in Section 09 91 13 - Exterior Painting and 09 91 23 - Interior Painting .

a. Coordinate primer with finish paint and coating, as applicable, to provide sound foundation for field-applied topcoats despite prolonged exposure during construction.

b. Apply primer immediately following surface preparation.

J. Galvanize all exterior steel members to comply with ASTM A123/A123M. Provide minimum 1.7 oz/sq ft galvanized coating.

K. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.03 MATERIALS - ALUMINUM

A. Extruded Aluminum: ASTM B221 (ASTM B221M), 6063 alloy, T6 temper.

B. Sheet Aluminum: ASTM B209/B209M, 5052 alloy, H32 or H22 temper.

C. Aluminum-Alloy Drawn Seamless Tubes: ASTM B210/B210M, 6063 alloy, T6 temper.

D. Aluminum-Alloy Bars: ASTM B211/B211M, 6061 alloy, T6 temper.

E. Aluminum-Alloy Sand Castings: ASTM B26/B26M.

F. Aluminum-Alloy Die Castings: ASTM B85/B85M.

G. Bolts, Nuts, and Washers: Stainless steel.

H. Welding Materials: AWS D1.2/D1.2M; type required for materials being welded.

2.04 FABRICATION

A. Ferrous Metal Surfaces, General:

1. For metal fabrications exposed to view upon completion of the Work: Provide ferrous metals materials selected for their surface flatness, smoothness, and freedom from surface blemishes.

2. Do not use materials whose exposed surfaces exhibit pitting, seam marks, roller marks, rolled trade names, roughness, and, for steel sheet, variations in flatness exceeding those permitted by reference standards for stretcher-leveled sheet.

B. Hot-dip galvanize fabricated ferrous items, indicated as remaining unpainted, after fabrication. Field connections shall be bolted or screwed where possible. Avoid field cutting and welding which damage galvanized coating.

C. Fit and shop assemble items in largest practical sections, for delivery to site.

D. Fabricate items with joints tightly fitted and secured.

E. Gas cutting of non-structural steel items may be acceptable where stress is not transmitted through flame-cut surfaces.

1. Make cuts clean and to contour.

2. Deduct 1/8 inch from effective width of members cut by torch.

F. Continuously seal joined members by intermittent welds and plastic filler.

G. Joints Exposed to Weather or Water: Fabricate to keep water out, or provide adequate drainage of water that penetrates.

H. Steel Tubing and Piping Fabrication: Unless otherwise indicated, close ends with plate stock so no exposed ends of tubing and piping. Grind all edges.

I. Connections, General:

1. Component parts of built-up members shall be well-pinned with closely-fitted contact.
2. Conceal connections where possible.
3. Otherwise, make countersinks for concealment after fabrication, except where noted.

J. Welding: Conform to AWS D1.1/D1.1M recommendations.

1. Do not field weld galvanized components to remain unfinished.
2. Provide continuous welds at welded corners and seams.
3. Grind exposed welds smooth and flush with base material.
4. Re-weld to fill holes. Putties and fillers are not acceptable.

K. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

L. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

1. Bolted and Screwed Connections:
    a. Provide holes and connections for work specified in other Sections.
    b. Use bolts for field connections only.
    c. Provide washers under heads and nuts bearing on wood.
    d. Draw all nuts tight and nick threads of permanent connections.
    e. Use beveled washers where bearing is on sloped surfaces.
    f. Where screws must be used for permanent connections in ferrous metal, use flat head type, countersunk, with screw slots filled and finished smooth and flush.

M. Furnish components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.05 FABRICATED ITEMS

A. Rough Hardware

1. Provide bent or otherwise custom fabricated bolts, plates, anchors, hangers, dowels, and other miscellaneous steel and iron shapes as indicated on Drawings.

B. Other Products and Fabrications

1. Other Products and Fabrications: Provide all materials not specifically described but required for a complete and proper installation, as selected by the Contractor, subject to review and acceptance by Owner Representative and Architect.

C. Exterior Aluminum: 2x6 Pre-finished Aluminum Extrusion and Prefinished Aluminum Shade Fin.

D. Bollards: Steel pipe, concrete filled, as detailed; galvanized finish.

E. Slotted Channel Framing: Fabricate channels and fittings from structural steel complying with the referenced standards; electro-galvanized per ASTM B633 Type III, SC 1 finish.

F. Enclosure Gates:

1. Fabricated steel shapes as detailed on Drawings, hot-dipped galvanized finish after fabrication, with galvanized perforated steel panel infill.
2. Steel Face Panels for Gates:
    a. Corrugated Panels: 18 gage galvanized steel box-rib style decking, 1-1/2 inches deep; ASC Steel Deck Division of ASC Profiles, Inc., or equal.
3. All welded construction.
4. Hardware: Welded on heavy duty butt hinges, minimum 4-hinges per leaf, latch device mounted 40 inches above finish surface and including padlock eye, drop rod with steel pipe receivers cast into concrete at both open and closed positions (both leafs).
5. At Pedestrian Gate: Provide 16 gage steel sheet kick plate on push side of gate up to a minimum of 10 inches above finish surface.
    a. Connect kick plates with a 16 gage closure placed on top of kick plates; from front to back plates and side to side. Overlap to outside on top of kick plates a minimum 1/2 inch. Tack or spot weld as required.
    b. Kick plate to have drain holes in back face to minimize collection of water in bottom of angle frame.

2.06 POST INSTALLED CONCRETE ANCHORS

A. Manufacturers:

1. Manufacturers: Provide products as indicated on the approved Structural Drawings.
2. Substitutions: Substitutions of products from manufacturer's not listed are not permitted.
    a. Substitution of structural anchors requires structural calculations and DSA approval.

B. Materials:

1. Conform to Code Evaluation Report, ACI 355.4, DSA IR 17-11, and DSA IR 22-2.
2. Interior Use: For use in conditioned environments free from potential moisture, provide zinc plated carbon steel anchors.
3. Exterior Use:
    a. In exposed or potentially wet environments, and for attachment of exterior cladding materials, provide stainless steel anchors.
    b. Stainless steel nuts and washers shall be of matching alloy group of equal or greater strength than the rod.
    c. Avoid installing stainless steel anchors in contact with galvanically dissimilar metals.

4. Deformed Reinforcing Bars: Deformed steel rebar conforming to ASTM A615/A615M Grade 60. Permissible sizes as described in each adhesive products ICC report.

C. Mechancial Anchors:

1. Expansion, screw or undercut anchors having current ICC approval for use in cracked and uncracked concrete, with a published ICC Evaluation Service report.
    a. Type and size as indicated on drawings.
2. Basis of Design Approved Products conforming to this specification are acceptable for anchoring to concrete are as indicated on Drawings:
3. Basis of Design Approved Products conforming to this specification are acceptable for anchoring to grouted masonry are as indicated on Drawings:

D. Adhesive Anchors:

1. Cartridge Injection Adhesive Anchors: Threaded carbon steel rod, inserts, or reinforcing dowels complete with required nuts, washers, adhesive system and manufacturer's installation instructions.
    a. Type and size as indicated on drawings.
    b. Current ICC approval for use in cracked and uncracked concrete with a published ICC Evaluation Service report required.
2. Interior Use: Unless otherwise indicated on the Drawings, provide:
    a. Carbon steel threaded rods conforming to specification as indicated on structural drawings. Where no specification and grade are indicated, provide: ASTM A193/A193M Type B7 with zinc plating in accordance with ASTM B633, Type III Fe/Zn 5 (SC1).
3. Exterior Use: As indicated on the Drawings, provide stainless steel anchors.
    a. Stainless steel anchors shall be AISI Type 304 and Type 316 stainless steel provided with stainless steel nuts and washers of matching alloy group and minimum proof stress equal to or greater than the specified minimum full-size tensile strength of the externally threaded fastener.
    b. All nuts shall conform to ASTM F594, unless otherwise specified.
4. Basis of Design Approved Products conforming to this specification are acceptable for anchoring to concrete are as indicated on Drawings:
5. Basis of Design Approved Products conforming to this specification are acceptable for anchoring to grouted masonry are as indicated on Drawings:

E. Power-Driven/Powder Actuated Fasteners

1. Use only if approved by Architect, generally not permitted where not specifically indicated or in load-bearing installations; as indicated on Drawings.
    a. Substitutions: See Section 01 60 00 - Product Requirements.

2.07 FINISHES - STEEL

A. Mechanical Finishes: Complete finishing prior to fabrication wherever possible.

1. After fabrication, finish all joints, bends, abrasions, and other surface blemishes to match finish.
2. Protect finish on exposed surfaces by using temporary protective covering.

B. Prime paint steel items.
1. Exceptions: Galvanize items to be embedded in concrete.
2. Exceptions: Do not prime surfaces in direct contact with concrete, where field welding is required, and items to be covered with sprayed fireproofing.

C. Prepare surfaces to be primed in accordance with SSPC-SP2.
1. Exterior fabrications: Clean in accordance with SSPC-SP 5, SSPC-SP 6, 8, or SSPC-SP 10.

D. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

E. Prime Painting: One coat.

F. Galvanizing of Structural Steel Members: Galvanize all exterior steel members after fabrication to ASTM A123/A123M requirements. Provide minimum 1.7 oz/sq ft galvanized coating.

G. Galvanizing of Non-structural Items: Galvanize all exterior steel membersafter fabrication to ASTM A123/A123M requirements.

2.08 FABRICATION TOLERANCES

A. Squareness: 1/8 inch maximum difference in diagonal measurements.

B. Maximum Offset Between Faces: 1/16 inch.

C. Maximum Misalignment of Adjacent Members: 1/16 inch.

D. Maximum Bow: 1/8 inch in 48 inches.

E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

F. Punch, drill and reaming in manner to leave clean, true lines and surfaces.
1. Oversize hole 1/16 inch by punching, when material thickness is equal to or less than bolt diameter plus 1/8 inch.
2. Sub-punch 1/16 inch smaller than bolt and drill or ream to oversize by 1/16 inch, when material thickness is thicker than bolt diameter plus 1/8 inch.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

B. Field Inspection of Fabricated Products: Prior to installation, inspect products for damage and verify markings and dimensions against reviewed submittals.

C. Environmental Conditions: Do not install products intended for interior locations when spaces are uncovered and unprotected from inclement weather.

D. Coordination: Coordinate metal fabrications Work with Work specified in other Sections so that related Work shall be accurately and properly joined.

E. Post Installed Anchors

1. Verification of Conditions
    a. Base Material Strength: Unless otherwise specified, do not drill holes in concrete until concrete has achieved full design strength.
    b. Temperature of concrete surface and ambient air temperature must meet manufacturer's requirements prior to use of adhesive anchor products.
    c. Embedded Items:
        1) Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors.
        2) Exercise care in coring or drilling to avoid damaging existing reinforcing or embedded items.
        3) Take precautions as necessary to avoid damaging anything embedded in the concrete including electrical/telecommunications conduit, gas pipes, and plumbing pipes.
        4) Notify the Architect if reinforcing steel or other embedded items are encountered during drilling.
    d. Beginning of installation indicates acceptance of existing conditions.

3.02 PREPARATION

A. Clean and strip primed steel items to bare metal where site welding is required.

B. Supply setting templates to the appropriate entities for steel items required to be cast into concrete.

C. Make provision for erection loads with temporary bracing. Keep work in alignment.

D. Obtain Architect's review prior to site cutting or making adjustments not indicated on Drawings and reviewed shop drawings.

3.03 INSTALLATION

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

C. Field weld components as indicated on drawings.

D. Perform field welding in accordance with AWS D1.1/D1.1M.

E. Obtain approval prior to site cutting or making adjustments not scheduled.

F. After erection, prime welds, abrasions, and surfaces not shop primed , except surfaces to be in contact with concrete.
    1. Touch up galvanized steel with cold galvanizing compound.

3.04 INSTALLATION OF POST-INSTALLED ANCHORS

A. Installation shall comply with all manufacturer's instructions and current ICC ESR report.

B. Post-Installed Anchors in Hardened Concrete.

1. Drilled-in anchors and/or powder driven pins in existing non-prestressed reinforced concrete: use care and caution to avoid cutting or damaging the existing reinforcing bars.
2. Maintain a minimum clearance of one inch between the reinforcement and the drilled-in anchor and/or pin.

C. Manufacturer shall provide on-site training for all personnel who will be installing post-installed adhesive anchors at the beginning of the work. Installation of anchors must be performed by a certified installer.

D. Where manufacturer recommends use of special tools for installation of anchors, such tools shall be used, unless otherwise permitted specifically by the Engineer.

E. Drill holes with rotary impact hammer drills using carbide-tipped bits. Bits must be of type required and permitted by ICC ESR report.
1. Drill holes with rotary impact hammer drills using carbide-tipped bits or core drills using diamond core bits.
2. Drill bits shall be of diameters as specified by the anchor manufacturer.
3. Unless otherwise shown on the Drawings, all holes shall be drilled perpendicular to the concrete surface.
4. Where anchors are to be installed in cored holes, use core bits with matched tolerances as specified by the manufacturer.
5. Cored holes may only be used if acceptable to the Engineer and in compliance with ICC ESR report.

F. Holes shall be cleared of debris after holes are drilled per manufacturer's instructions.
1. For adhesive installations, at a minimum, holes shall be blown out with oil-free compressed air and shall be brushed with a wire or nylon brush.
2. Holes shall than be blown out one additional time with oil-free compressed air.
3. Additional hole cleaning requirements may be required by manufacturer and ICC ESR Report.

G. During adhesive curing time period, the temperature of the substrate shall be kept above the minimum substrate temperature as defined by the manufacturer. Contractor shall determine the appropriate means and methods to ensure that the temperature is kept above the required minimum temperature required before adhesive installation is begun.

3.05 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch.

C. Maximum Out-of-Position: 1/4 inch.

3.06 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01 45 33 - Code-Required Special Inspections and Procedures.
1. Special Inspector: AWS-CWI qualified inspector to inspect all welds.

B. Inspection: Special inspection of post-installed anchors shall be provided as required by the ICC-ES report for that anchor and not less than the requirements of the Structural Drawings and the following (whichever is the most restrictive):

1. Continuously observe the installation of all anchors, or as specified in the ICC report.
    a. Minimum anchor embedments, proof loads and torques shall be as shown on the Drawings.
    b. Load Testing: Per Structural General Notes on Drawings.
    c. Post-Installed Anchor Load Testing: CBC Section 1910A.5.
        1) As indicated on Structural Drawings, minimum 10 % of drilled-in sill plate bolting anchor applications shall be proof loaded by the independent testing laboratory.
        2) 100 % of each type and size of drilled-in anchor shall be proof loaded by the independent testing laboratory.
        3) Adhesive anchors and capsule anchors shall not be torque tested unless otherwise directed by the Architect.
        4) Tension testing should be performed in accordance with ASTM E488/E488M.
        5) Torque shall be applied with a calibrated torque wrench.
        6) Proof loads shall be applied with a calibrated hydraulic ram, as required and indicated on the Structural Drawings. Comply with CBC 1910A.5.
            (a) Displacement of adhesive and capsule anchors at proof load shall not exceed D/10, where D is the nominal anchor diameter.
        7) If any of the tested anchors fail to achieve the specified torque or proof load within the limits as defined on the Drawings, all anchors of the same diameter and type as the failed anchor shall be tested, unless otherwise instructed by the Architect.
    d. Verify anchor type, anchor dimensions, hole dimensions, anchor spacing, edge distances, anchor embedment and adherence to the manufacturer's published installation instructions.
    e. For adhesive anchors also verify hole cleaning technique, adhesive expiration date and proper mixing and dispensing.
2. Subsequent inspection of installation will be required when there is a change of personnel doing the installation. Change is defined as any one or more persons drilling or preparing holes, or installing anchors.
3. Visually inspect 100% of all installed anchors.

C. Reporting:

1. Daily reports shall reference the applicable ICC-ES report number, indicate that all specified criteria were complied with and provide itemized verification of all inspected items.
2. Special Inspector shall immediately report any deviations from the requirements to the Architect.

D. Defective Work:

1. Installations that are not accepted by the Special Inspector shall be considered defective.
2. Provide additional testing and inspection to determine acceptability of defective work, as directed by the Architect at Contractor's expense.

3.07 REPAIR OF DEFECTIVE WORK

A. Remove and replace misplaced, defective or malfunctioning anchors at Contractor's expense. Replacement of anchors requires signed structural detail, unless otherwise noted.

B. Fill empty anchor holes and patch failed anchor locations with high-strength, non-shrink non-metallic grout.

END OF SECTION

SECTION 06 05 73
WOOD TREATMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Field-applied termiticide for wood materials.

B. Field-applied termiticide for other building materials.

C. Field-applied mildewcide for wood materials.

D. Filed-applied mold cleaner.

E. Field-applied preservative treatment for wood materials.

1.02 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide technical data for wood preservative materials and application instructions.

1.03 DELIVERY, STORAGE, AND HANDLING

A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

PART 2 PRODUCTS

2.01 FIELD-APPLIED PRESERVATIVE WOOD TREATMENT

A. Manufacturers:

1. Arch Wood Protection, Inc: www.wolmanizedwood.com.
2. Green Products Company; Copper Green: greenproductsco.net.
3. Nisus Corporation: www.nisuscorp.com/#sle.
4. Osmose, Inc: www.osmose.com.
5. Viance, LLC: www.treatedwood.com.
6. Substitutions: See Section 01 60 00 - Product Requirements.

B. Field-Applied Termiticide for Wood: Borate mineral salt-based, spray-applied, penetrating termiticide.

1. Products:
   a. Nisus Corporation; Bora-Care: www.nisuscorp.com/#sle.
   b. Substitutions: See Section 01 60 00 - Product Requirements.

C. Field-Applied Termiticide and Mildewcide: Borate mineral salt based, spray applied termiticide, mildewcide, and mold growth preventative.

1. Products:

a. Nisus Corporation; Bora-Care: www.nisuscorp.com/#sle.

b. Substitutions: See Section 01 60 00 - Product Requirements.

D. Field-Applied Termiticide for Wood, Steel and Concrete: Borate mineral salt based, spray applied termiticide formulated for use on wood, steel, concrete and other building materials.

1. Active Ingredient: 40 percent minimum disodium octaborate tetrahydrate (DOT).

2. Carrier and Penetrant: Proprietary glycol solution.

3. Products:

a. Nisus Corporation; Bora-Care with Mold-Care: www.nisuscorp.com/#sle.

b. Substitutions: See Section 01 60 00 - Product Requirements.

E. Field-Applied Mold Cleaner: Nonbleaching, oxidizer based formula with high-pH tolerant surfactant. Contains no sodium hydroxide or sodium hypochlorite.

1. Products:

a. Nisus Corporation; Mold Clean: www.nisuscorp.com/#sle.

b. Substitutions: See Section 01 60 00 - Product Requirements.

F. Surface-Applied Wood Preservative: Pressure treatment in accordance with AWPA U1, using water borne preservative.

1. Liquid Wood Preservative: Roller, spray, or injection formula.

a. Preservative Action: Fungicidal, insecticidal, and moldicidal effects.

b. Active Ingredients: Clear solution of 19.6 percent disodium octaborate tetrahydrate with 1.0 percent didecyl dimethyl ammonium chloride.

c. Carrier: Proprietary mix of propylene glycol and water.

d. VOC: 6.51 lb/gal.

PART 3 EXECUTION

3.01 PREPARATION

A. Remove dust, dirt and other contaminants from treatment surfaces. Remove tarpaulins, dropcloths, strippable protective films, etc., from areas to be treated. Move equipment and stored materials that block or prevent product application.

B. Verify materials do not exceed the specified percent moisture content before applying wood treatment.

C. Discard pieces with defects which might impair quality or work.

3.02 INSTALLATION - GENERAL

A. Provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.03 FIELD-APPLIED WOOD TREATMENT

A. Comply with manufacturer's written mixing and application instructions.

B. Termiticide: Apply to items indicated:

1. Structural wood and sill plates within 24 inches, minimum, of point of contact with foundation.
2. Wood, wood-based, and cellulosic sheathing within 24 inches, minimum, of point of contact with foundation.
3. Pipe and plumbing penetrations up to 24 inches, minimum, above slab and slab surface and within 6 inches, minimum, of pipe or penetration.
4. Apply six inches, minimum, on both sides of control joints and construction joints in slabs and joints between slabs and abutting material.

C. Mildewcide: Apply to wood and wood-based building materials indicated.
1. Structural wood and sill plates within 24 inches, minimum, of point of contact with foundation.
2. Wood, wood-based, and cellulosic sheathing within 24 inches, minimum, of point of contact with foundation.

END OF SECTION

SECTION 06 10 00
ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Structural dimension lumber framing.

B. Nonstructural dimension lumber framing.

C. Rough opening framing for doors, windows, and roof openings.

D. Sheathing.

E. Roof-mounted curbs.

F. Roofing nailers.

G. Preservative treated wood materials.

H. Communications and electrical room mounting boards.

I. Concealed wood blocking, nailers, and supports.

J. Miscellaneous wood nailers, furring, and grounds.

1.02 RELATED REQUIREMENTS

A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 03 30 00 - Cast-in-Place Concrete: Setting anchors in concrete.

C. Section 05 50 00 - Metal Fabrications: Miscellaneous steel connectors and support angles for wood framing.

D. Section 07 62 00 - Sheet Metal Flashing and Trim: Sill flashings.

1.03 REFERENCE STANDARDS

A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

C. ASTM B695 - Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel.

D. ASTM C557 - Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing.

E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

F. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials.

G. ASTM F2130 - Standard Test Method for Measuring Repellency, Retention, and Penetration of Liquid Pesticide Formulation Through Protective Clothing Materials.

H. AWC (WFCM) - Wood Frame Construction Manual for One- and Two-Family Dwellings.

I. AWPA M4 - Standard for the Handling, Storage, Field Fabrication and Field Treatment of Preservative-Treated Wood Products.

J. AWPA U1 - Use Category System: User Specification for Treated Wood.

K. CBC - California Building Code.

L. ICC-ES AC380 - Acceptance Criteria for Termite Physical Barrier Systems.

M. ITS (DIR) - Directory of Listed Products.

N. PS 1 - Structural Plywood.

O. PS 2 - Performance Standard for Wood Structural Panels.

P. PS 20 - American Softwood Lumber Standard.

Q. UL (DIR) - Online Certifications Directory.

R. WCLIB (GR) - WCLB Standard Grading Rules for West Coast & Imported Softwood Lumber No.18.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Submit technical data on wood treatment.

C. Manufacturer's Certificate: Certify that wood products supplied for rough carpentry meet or exceed specified requirements.

D. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in District's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

1.06 DELIVERY, STORAGE, AND HANDLING

A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

1.07 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.

1. Species: Douglas Fir-Larch, unless otherwise indicated.

2. If no species is specified, provide species graded by the agency specified; if no grading agency is specified, provide lumber graded by grading agency meeting the specified requirements.

3. Grading Agency: Grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee at www.alsc.org, and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

A. Grading Agency: West Coast Lumber Inspection Bureau; WCLIB (GR).

B. Sizes: Nominal sizes as indicated on drawings, S4S.

C. Moisture Content: S-dry or MC19.

D. Stud Framing (2 by 2 through 2 by 6):

1. Species: Douglas Fir-Larch.
2. Grade: No. 1 & Better.

E. Joist, Rafter, and Small Beam Framing (2 by 6 through 4 by 16):

1. Species: Douglas Fir-Larch.
2. Grade: No. 1 and Better.
   a. No. 1 & Better for joists and rafters;
   b. No. 1 for beams and stringers.

F. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:

1. Lumber: S4S, No. 1 or Construction Grade.
2. Boards: No. 2 or Standard Grade.

2.03 CONSTRUCTION PANELS

A. Roof Sheathing: PS 1 type, rated Structural I Sheathing.

1. Bond Classification: Exterior.
2. Span Rating: 40/20.
3. Performance Category: 19/32 PERF CAT.
4. Edge: Square edge.

B. Wall Sheathing: PS 1 type plywood.

1. Bond Classification: Exterior.
2. Grade: Structural I Sheathing.
3. Span Rating: 32/16.
4. Performance Category: 15/32 PERF CAT.
5. Edge Profile: Square edge.

C. Communications and Electrical Room Mounting Boards: PS 1 A-D plywood, or medium density fiberboard; 3/4 inch thick; flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.

D. Other Applications:

1. Plywood Concealed From View But Located Within Exterior Enclosure: PS 1, C-C Plugged or better, Exterior grade.
2. Plywood Exposed to View But Not Exposed to Weather: PS 1, A-D, or better.
3. Other Locations: PS 1, C-D Plugged or better.

2.04 FIRE-RETARDANT TREATMENT (FRT)

A. Products:
1. Hoover Treated Wood Products, Inc: www.frtw.com/#sle.
2. Koppers, Inc: www.koppersperformancechemicals.com/#sle.
3. T2EARTH, LLC; OnWood: www.t2earth.com/#sle.
4. UFP Industries; ProWood FR Lumber: www.ufpi.com/#sle.
5. Viance, LLC; D-Blaze: www.treatedwood.com/#sle.
6. Substitutions: See Section 01 60 00 - Product Requirements.

B. Provide factory-treated wood members in accordance with AWPA U1 and use category indicated.

C. Fire-Retardant Treatment: Interior Type A, Use Category UCFA (LT), Low-Temperature (low hygroscopic).
1. Treat blocking and other wood members concealed in noncombustible construction.
2. Treat electrical and communications panel backer boards.
3. Treat wood in locations indicated on drawings.

D. Kiln-dry after treatment (KDAT) to maximum moisture content of 19 percent for sawn material and 15 percent for plywood.

E. Fabrication of FRT Wood:
1. Ripping or milling of boards, lumber, and timber after treatment is not permitted.
2. Field cutting to length and drilling of holes in boards, lumber, and timber are permitted without additional treatment.
3. Field cutting and drilling of holes in plywood are permitted.

F. Label or brand FRT wood with classification mark of UL (DIR) or ITS (DIR) or other approved inspection agency, the treatment plant, name of treatment, species of wood, flame spread and smoke developed index, method of drying after treatment, and treating standard.

2.05 PRESSURE-PRESERVATIVE TREATMENT (PPT)

A. Products:
1. Koppers Performance Chemicals, Inc: www.koppersperformancechemicals.com/#sle.
2. Viance, LLC; Preserve ACQ: www.treatedwood.com/#sle.
3. Substitutions: See Section 01 60 00 - Product Requirements.

B. Provide factory-treated wood members in accordance with AWPA U1 and use category indicated.

C. Preservative Limitations for Interior Use Categories UC1 and UC2:

1. Use waterborne preservatives in interior locations, unless otherwise permitted and approved, with preservative retention for resistance to Formosan termites.

D. Applications - Treat the Following:

1. Wood framing in contact with exterior foundation walls where member is less than 8 inches from exposed earth: Use Category UC1, above ground, interior, dry.
2. Sleepers and sills on concrete or masonry in direct contact with earth: Use Category UC1, above ground, interior, dry.
3. Wood framing members in direct contact with interior of exterior masonry or concrete walls below grade: Use Category UC1, above ground, interior, dry.
4. Wood wall sheathing in contact with exterior foundation walls where sheathing is less than 8 inches from exposed earth: Use Category UC3A, above ground, exterior, protected.
5. Lumber and plywood in contact with membrane roofing and flashing: Use Category UC3B, above ground, exterior.
6. Lumber and plywood in contact with waterproofing and flashing: Use Category UC4A, ground contact.
7. Other locations indicated.

E. Kiln-dry wood after treatment with waterborne preservative to maximum moisture content of 19 percent for lumber and 15 percent for plywood.

F. Fabricate to maximum extent possible before treatment.

G. Field Treatment for Cuts and Holes in Preservative-Treated Wood: Comply with AWPA M4.

2.06 ACCESSORIES

A. Metal and Finish of Fasteners:

1. Comply with CBC 2304.10.2.1.
    a. Exterior Wall Coverings: Provide hot dipped or mechanically deposited zinc-coated steel, stainless steel, silicon bronze or copper.
        1) Provide coating weights for mechanically deposited zinc coating fasteners complying with ASTM B695, minimum Class 55.
2. Fire-Retardant-Treated Wood:
    a. Nails, timber rivets, wood screws, and lag screws: Hot-dip galvanized steel complying with ASTM A153/A153M Class D.
    b. Staples: Type 304 stainless steel.
    c. Fasteners other than staples, nails, timber rivets, wood screws, and lag screws: Mechanically deposited zinc-coated steel, ASTM B695 Class 55 or better.
3. Preservative-Treated Wood:
    a. Nails, timber rivets, wood screws, and lag screws - general use: Hot-dip galvanized steel complying with ASTM A153/A153M Class D.
        1) Exception: Fasteners in interior dry environment with SBX/DOT and zinc-borate treated wood only: Plain carbon steel is permitted.

b. Staples: Type 304 stainless steel.

c. Fasteners other than staples, nails, timber rivets, wood screws, and lag screws: Mechanically deposited zinc-coated steel, ASTM B695 Class 55 or better.

4. High Humidity Wood Locations: Hot-dip galvanized steel complying with ASTM A153/A153M.

5. Untreated Wood: Unfinished steel.

B. Die-Stamped Connectors: Hot dipped galvanized steel, sized to suit framing conditions.

1. For contact with preservative treated wood in exposed locations, provide minimum G185 galvanizing complying with ASTM A653/A653M.

2. Products:

a. Basis of Design Product: Connectors as manufactured by Simpson Strong-Tie, or approved equal.

b. Substitutions: See Section 01 60 00 - Product Requirements.

C. Joist Hangers: Hot dipped galvanized steel, sized to suit framing conditions.

1. For contact with preservative treated wood in exposed locations, provide minimum G185 galvanizing complying with ASTM A653/A653M.

2. Products:

a. Basis of Design Product: Connectors as manufactured by Simpson Strong-Tie, or approved equal.

b. Substitutions: See Section 01 60 00 - Product Requirements.

D. Termite Resistant Base Condition:

1. Termite-Resistant Sill Plate Barrier: Self-adhesive, film-backed barrier with release sheet; adheres to concrete substrates and blocks termite access.

a. Thickness: 68 mil, 0.068 inch.

b. Termite Resistance: 100 percent when tested in accordance with ICC-ES AC380.

c. Water Vapor Permeance: 0.035 perm, maximum, when tested in accordance with ASTM E96/E96M.

d. Products:

1) Basis of Design: Polyguard Products Inc.; TERM® Sill Barrier | Termite Barrier : www.polyguardproducts.com, or equal.

2) Substitutions: See Section 01 60 00 - Product Requirements.

2. Termite-Resistant Sill Flashing: Self-adhesive membrane; polyethylene film bonded to sealant.

a. Thickness: 40 mil, 0.040 inch.

b. Width: 12 inches, minimum.

c. Termite Resistance: 100 percent when tested in accordance with ICC-ES AC380.

1) ICC ESR 3632.

d. Water Vapor Permeance: 0.035 perm, maximum, when tested in accordance with ASTM E96/E96M.

e. Pesticide repellency; chlorodane, fipronil, and permethrin: 0 percent penetration, tested to ASTM F2130.

f. Products:

1) Basis of Design: Polyguard Products Inc.; TERM® Flashing Barrier | Termite Barrier : www.polyguardproducts.com, or equal.

2) Substitutions: See Section 01 60 00 - Product Requirements.

E. Sill Flashing: See Section 07 62 00.

F. General Purpose Construction Adhesives: Comply with ASTM C557.

PART 3 EXECUTION

3.01 PREPARATION

A. Install sill gasket under sill plate of framed walls bearing on foundations; puncture gasket cleanly to fit tightly around protruding anchor bolts.

3.02 INSTALLATION - GENERAL

A. Select material sizes to minimize waste.

B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.03 FRAMING INSTALLATION

A. Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength or result in unacceptable appearance of exposed members.

B. Make provisions for temporary construction loads, and provide temporary bracing sufficient to maintain structure in true alignment and safe condition until completion of erection and installation of permanent bracing.

C. Install structural members full length without splices unless otherwise specifically detailed.

D. Comply with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes and AWC (WFCM) Wood Frame Construction Manual.

E. Install horizontal spanning members with crown edge up and not less than 1-1/2 inches of bearing at each end.

F. Construct double joist headers at floor and ceiling openings and under wall stud partitions that are parallel to floor joists; use metal joist hangers unless otherwise detailed.

G. Provide bridging at joists in excess of 8 feet span as detailed. Fit solid blocking at ends of members.

H. Frame wall openings with two or more studs at each jamb; support headers on cripple studs.

3.04 BLOCKING, NAILERS, AND SUPPORTS

A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.

B. In framed assemblies that have concealed spaces, provide solid wood fireblocking as required by applicable local code, to close concealed draft openings between floors and between top story and roof/attic space; other material acceptable to authorities having jurisdiction may be used in lieu of solid wood blocking.

1. Comply with CBC Section 718.2 Fireblocking.

C. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.

D. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.

E. Provide nonstructural framing and blocking to support the following:

1. Cabinets and shelf supports.
2. Wall brackets.
3. Handrails.
4. Grab bars.
5. Towel and bath accessories.
6. Wall-mounted door stops.
7. Chalkboards and marker boards.
8. Wall paneling and trim.
9. Joints of rigid wall coverings that occur between studs.
10. Other wall- or ceiling-mounted items indicated on drawings.
11. Equipment.

3.05 ROOF-RELATED CARPENTRY

A. Coordinate installation of roofing carpentry with deck construction, framing of roof openings, and roofing assembly installation.

B. Provide wood curb at each roof opening except where specifically indicated otherwise; form corners by alternating lapping side members.

3.06 INSTALLATION OF CONSTRUCTION PANELS

A. Roof Sheathing: Secure panels with long dimension perpendicular to framing members, with ends staggered and over firm bearing.

1. At long edges provide solid edge blocking where joints occur between roof framing members.
2. Nail panels to framing; staples are not permitted.

B. Wall Sheathing: Secure with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using nails, screws, or staples.

1. Install plywood wall sheathing in accordance with manufacturer's current ICC-ES evaluation report for specified sheathing product.
2. Use plywood or other acceptable structural panels at building corners, for not less than 96 inches, measured horizontally.
3. Provide inlet diagonal bracing at corners.

C. Communications and Electrical Room Mounting Boards: Secure with screws to studs with edges over firm bearing; space fasteners at maximum 24 inches on center on all edges and into studs in field of board.
1. At fire-rated walls, install board over wall board indicated as part of the fire-rated assembly.
2. Where boards are indicated as full floor-to-ceiling height, install with long edge of board parallel to studs.
3. Install adjacent boards without gaps.
4. Size and Location: As indicated on drawings.

3.07 SITE-APPLIED WOOD TREATMENT

A. Apply preservative treatment compatible with factory applied treatment at site-sawn cuts, complying with manufacturer's instructions.

B. Allow preservative to dry prior to erecting members.

3.08 TOLERANCES

A. Framing Members: 1/4 inch from true position, maximum.

B. Variation from Plane, Other than Floors: 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

3.09 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements for additional requirements.

3.10 CLEANING

A. Waste Disposal: See Section 01 74 19 - Construction Waste Management and Disposal.
1. Comply with applicable regulations.
2. Do not burn scrap on project site.
3. Do not burn scraps that have been pressure treated.
4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or “waste-to-energy” facilities.

B. Do not leave wood, shavings, sawdust, etc. on the ground or buried in fill.

C. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION

SECTION 06 41 00
ARCHITECTURAL WOOD CASEWORK

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wood casework with laminate cladding.

B. Cabinet and drawer hardware.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry.

B. Section 08 71 00 - Door Hardware.

C. Section 12 36 00 - Countertops.

1.03 ABBREVIATIONS AND ACRONYMS

A. CCP: Certified Compliance Program.

B. CSIP: Certified Seismic Installation Program.

C. HPDL: High-pressure decorative laminate.

D. MCP: Monitored Compliance Program.

E. MDF: Medium-density fiberboard.

F. MDO: Medium-density overlay.

G. WI: Woodwork Institute.

1.04 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design.

B. ANSI A208.2 - Medium Density Fiberboard (MDF) for Interior Applications.

C. ASTM D1037 - Standard Test Methods for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials.

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

E. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards.

F. BHMA A156.9 - Cabinet Hardware.

G. BHMA A156.11 - American National Standard for Cabinet Locks.

H. BHMA A156.18 - Standard for Materials and Finishes.

I. CARB (ATCM) - Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products.

J. CBC - California Building Code.

K. CBC Ch. 11B - California Building Code-Chapter 11B.

L. GANA (GM) - GANA Glazing Manual.

M. ISO 4586-3 - High-Pressure Decorative Laminates (HPL, HPDL) – Sheets Based on Thermosetting Resins (Usually Called Laminates) – Part 3: Classification and Specifications for Laminates Less than 2 mm Thick and Intended for Bonding to Supporting Substrates.

N. PS 1 - Structural Plywood.

O. PS 20 - American Softwood Lumber Standard.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate schedule of climate-controlled rooms with schedule of storage of wood and wood-based materials requiring climate-controlled environments.
2. Coordinate work of this section with installation of wood blocking, wood backing, metal strapping, and other anchorage that provides casework backing and structural support.
3. Coordinate work of this section with rough-in electrical integrally-related with casework.

B. Preinstallation Meeting: Convene preinstallation meeting not less than one week prior to completion of framing behind casework; require attendance of contractor, framing contractor, and casework fabricator.

1. Review locations of casework backing and structural support.
2. Review backing attachment method to wall framing as indicated on drawings.

1.06 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. WI Quality Certification Submittal Requirements: Comply with AWMAC/WI (NAAWS)

C. Product Data: Submit manufacturer's published, product descriptive data.

1. Panel Cores for HPDL Panels: For each type, include thickness.
2. HPDL Laminates: For each type, indicate description, thickness, and color.
3. Laminate Edgebanding: For each type, indicate material and thickness.
4. Hardware: For each type of cabinet and drawer hardware.
5. Locks: For each type of cabinet and drawer lock.
6. Accessory Components: For each type of glass and grommet.

D. Shop Drawings:

1. General: Each sheet sequentially numbered and dated.
   a. Sheet Size: 11 by 17 inches.
   b. Contents: Indicate project name and project address.
2. WI Quality Certification Programs Requirements for Shop Drawings:
   a. Comply with AWMAC/WI (NAAWS).
3. Reference Plans: Casework locations in relative context of building floor plans.
   a. Drawing Scale: 1/4 inch = 1 foot, minimum.
4. Plans and Elevations: Plan and elevation views of each assembly type.

a. Include rough opening dimensions, casework assembly dimensions, locations and sizes of cutouts, drawer locations, door locations, door swings, and hinge locations

b. Drawing Scale: 3/8 inch = 1 foot, minimum.

5. Detailed Section: Dimensioned section views of each casework configuration.

a. Include appropriate locations for casework wall anchorage.

b. Drawing Scale: 1-1/2 inch = 1 foot, minimum.

6. Details: Dimensioned casework assembly details with material thicknesses.

a. Include laminate-clad panels, panel cores, and concealed casework components.

b. Drawing Scale: 3 inches = 1 foot, minimum.

E. Samples:

1. WI Quality Certification Requirements for Samples: Comply with AWMAC/WI (NAAWS).

2. Samples for Initial Selection:

a. HPDL Edgebanding: For each edgebanding type, submit two manufacturer's standard palettes, indicating full range of colors.

3. Samples, Laminate-Clad Panels: For each laminate-clad type, submit two, laminate-clad sample panels; size: 8 by 8 inches; thickness: 3/4 inch.

4. Samples for Initial Selection:

a. HPDL Edgebanding: For each edgebanding type, submit two manufacturer's standard palettes, indicating full range of colors.

5. Samples, Edgebanding:

a. HPDL Edgebanding: For each edgebanding type, submit two sample strips, 6 inches long, minimum.

6. Samples, Laminates: For each laminate type, submit two samples for each specified color.

7. Samples, Hardware: For each hinge, pull, catch, latch, shelf rest, and cabinet lock type, submit one sample, full-size, indicating specified finish.

8. Samples, Hardware: For each adjustable shelf standard type, submit one sample, indicating specified finish; size: 6 inches.

F. Certificates, WI Certification of Products: Before product delivery to site, provide three Woodwork Institute Certified Compliance Certificates indicating products to be delivered meet requirements of AWMAC/WI (NAAWS) for grades specified.

G. Certificates, WI Certification of Products and Installation: At completion of installation, provide three Woodwork Institute Certified Compliance Certificates indicating products installed and casework installation complies with AWMAC/WI (NAAWS) for grades specified.

H. Certificates, WI Monitored Compliance: After installation is completed, provide three Woodwork Institute (WI) Monitored Compliance Certificates indicating acceptance by WI Director of Architectural Services.

I. Certificates, WI CSIP Certification: After installation, provide three Woodwork Institute (WI) Certified Installation Program (CSIP) certificates identifying work covered and certifying that installation complies with WI CSIP attachment details and schedules.

J. Fabricator's Instructions: Provide fabricator's installation instructions for shop-fabricated units.

K. WI Seismic Installation Program Reports: Provide Woodwork Institute Certified Seismic Installation Program (CSIP) report regarding casework backing; identify locations where backing is missing or improperly installed.

L. Fabricator's qualification statement.

M. Installer's qualification statement.

N. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.

1.07 QUALITY ASSURANCE

A. Fabricator Qualifications: WI-accredited millwork company.

B. Installer Qualifications: WI QCP-accredited installer.

C. Fabricator/Installer Qualifications: Firm specializing in fabricating and installing products specified in this section with minimum five years of documented experience; with qualifications indicating ability to comply with requirements of this section.

1. Woodworking company with at least one project in past five years with value of casework within 20 percent of casework cost for this project.
2. Single Source Responsibility: Provide fabrication and installation from single woodworking company.

D. Woodwork Institute (WI) Certification Programs:

1. Monitored Compliance Program (MCP):
    a. Provide casework in accordance with Woodwork Institute (WI) Monitored Compliance Program (MCP); program includes monitoring of casework products and installation by WI Director of Architectural Services; program monitors for compliance with contract documents; program compliance is documented by compliance certificates.
    b. At completion of installation, provide Monitored Compliance Certificate confirming installation complies with AWMAC/WI (NAAWS) for grades specified.
2. Certified Seismic Installation Program (CSIP):
    a. Before partitions are closed, provide Woodwork Institute (WI) Certified Installation Program (CSIP) report confirming backing is provided at casework locations, or identifying locations where backing is missing or improperly located.
    b. After installation, provide Certified Seismic Installation Program (CSIP) certificate certifying installation complies with WI CSIP attachment details and schedules.

E. Regulatory Requirements:

1. Wall hung cabinets and floor supported cabinets over 5 feet high shall be braced and anchored in accordance with the California Building Code (CBC) Title 24 Part 2, Table 1607A.1.
    a. Comply with HCIA (OHSPD) Pre-Approval OPM-0092.

2. Requirements for Persons with Disabilities: Provide products meeting requirements of California Code of Regulations (CCR), Title 24, Part 2, CBC, CBC Ch. 11B, and ADA Standards, latest amendment.
    a. Operable parts for all accessible casework shall comply with CBC Ch. 11B-309 Operable Parts.
    b. Pull hardware shall be U-shaped wire pulls or equally accessible at all accessible casework; CBC Ch. 11B-811.4 Operable Parts.

1.08 MOCK-UPS

A. See Section 01 40 00 - Quality Requirements for additional requirements.

B. Provide one base cabinet mock-up with materials, finish, and hardware for specified cabinet finish type and for grade specified.
    1. Components: Provide two drawers and two doors.
    2. Shelves: Provide one shelf.
    3. Size: 32 inches wide, 33 inches high, 24 inches deep.
    4. Countertop Over Base Cabinet: See Section 12 36 00 for countertops.

C. Provide one wall cabinet mock-up with materials, finish, and hardware for specified cabinet finish type and for grade specified.
    1. Components: Provide two drawers and two doors.
    2. Shelves: Provide one shelf.
    3. Shelves: One shelf.

D. Locate where directed.

E. Mock-up may remain as part of the work.

1.09 DELIVERY, STORAGE, AND HANDLING

A. See Section 01 74 19 - Construction Waste Management and Disposal for packaging waste requirements.

B. Deliver products in original packaging materials bearing product identification.

C. Store products prior to installation on flat, level, clean surfaces; elevate products above floors and protect from sunlight.

D. Store products in interior rooms with completed wet work and overhead work.

E. Relative Humidity Conditions for Storing Wood and Wood-Based Core Products:
    1. Maintain relative humidity between 25 and 45 percent.

F. Store non-wood-based products under cover and elevated above grade.
    1. Protect from excessive moisture and standing water.

G. For products other than wood and wood-based products, store and handle in accordance with fabricator's documented instructions.

H. Handle materials and products to prevent damage to edges, ends, or surfaces.

I. Handle wood products with clean hands or gloves; protect from marks or damage.

1.10 FIELD CONDITIONS

A. Ambient Conditions for Acclimation, Installation, and Post-Installation of Wood-Based Products:

1. Acclimation Period inside Installation Environments: 72 hours, minimum prior to installation.
2. Maintain temperature between 60 degrees F and 90 degrees F.
3. Relative Humidity Conditions During Installation and Post-Installation: Maintain relative humidity between 25 and 55 percent.
4. Maximum Sustained Time outside Specified Temperature Range: 24 hours.

PART 2 PRODUCTS

2.01 ARCHITECTURAL WOOD CASEWORK

A. Casework Finish: Wood casework with laminate cladding.

B. Provide casework and casework components in sizes and profiles as indicated on drawings.

1. Interior Clearances: Comply with specified performance requirements.

C. Adjustable Shelves, Number of Shelves Per Cabinet Unit:

1. Base Cabinets: One shelf for each cabinet unit.
2. Wall Cabinets: Two shelves for each cabinet unit.

D. Scribed Fillers:

1. Finish and Materials: Same materials and finish as exposed surfaces.
2. Material thickness: Comply with specified performance requirements.

2.02 PERFORMANCE REQUIREMENTS

A. Woodwork Institute (WI) Performance Requirements:

1. Comply with AWMAC/WI (NAAWS) general casework requirements, specified architectural wood casework finish or cladding type, and for specified grade indicated below.
2. Grade: Custom.

2.03 WOOD CASEWORK WITH LAMINATE CLADDING

A. Casework Construction:

1. Frameless Cabinet and Door Interface: Flush overlay.
2. Door and Drawer Front Profile: Flush.
3. Reveal Dimensions: Comply with performance requirements.

B. Wood Drawer Boxes with Laminate Cladding:

1. Comply with specified performance requirements.

C. Custom Grade - Laminate-Clad Wood Casework:

1. Exposed Exterior Surfaces, Panels to Receive Laminate Cladding:

a. HPDL Panels; Surface Finish: As indicated on drawings.

2. Exposed Interior Surfaces at Door and Drawer Fronts:
   a. Same laminate materials and thicknesses as exposed exterior surfaces.
      1) Color to match exposed interior or face.
3. Exposed Interior Surfaces Except Door and Drawer Front Surfaces:
   a. Comply with specified performance requirements.
4. Semi-Exposed Surfaces; Panels to Receive Laminate Cladding:
   a. Comply with specified performance requirements.

D. Edgebanding Applications for Laminate-Clad Wood Casework:
   1. Drawer Box Top Edges:
      a. Visible Cores: Not permitted.

E. Edgebanding Materials for Laminate-Clad Wood Casework:
   1. Thickness: 0.02 inch minimum; 0.12 inch maximum.
   2. PVC: Well-matched to exposed face; radiused and beveled on edges and corners if thickness is greater than 0.039 inch.

2.04 EDGE TREATMENT APPLICATIONS

A. Front Edges of Frameless Cabinets:
   1. Comply with specified performance requirements.

B. Top Edges of Cabinets:
   1. Comply with specified performance requirements.

C. Bottom Edges of Wall Cabinet Ends and Light Valances:
   1. Provide edgebanding materials and color to match exposed exterior surfaces.

D. Bottom Edges of Aprons:
   1. Provide edgebanding.

E. Hinged Door Edges:
   1. Provide edgebanding on all four edges except for solid wood doors.
   2. Provide edgebanding at back-beveled door edges.
   3. Miter wood edgebanding with thicknesses equal to or greater than 1/4 inch.

F. Sliding Door Edges:
   1. Provide edgebanding at vertical edges finished to match exposed surfaces.

G. Drawer Front and Drawer False Front Edges:
   1. Provide edgebanding on all four edges except for solid wood drawers.

H. Edges of Solid Wood Panel Drawer Boxes:
   1. Comply with specified performance requirements.

I. Adjustable Shelf Edges, Semi-Exposed Surfaces:

1. Provide edgebanding that matches exposed either exterior or interior surfaces at option of fabricator.

J. Pullout Shelf Edges:

1. Provide edgebanding materials compatible in color to exposed surfaces.

K. Edges of Cut-Outs:

1. Comply with specified performance requirements.

2.05 SOLID WOOD COMPONENTS

A. Description: Components fabricated from solid wood; types include profiled components and flat panels.

B. Comply with specified performance requirements.

C. Flat Panels for Drawer Fronts and Drawer False Fronts:

1. Thickness: 3/4 inch, nominal.

2.06 HPDL-CLAD PANELS

A. Description: Panels consisting of High-Pressure Decorative Laminate (HPDL) faces applied to cores; panel layup with face ply, back ply, and core of either single ply or odd number of inner plies, to produce balanced construction panel.

1. Panels subject to size limitations, minimum thickness requirements, and fabrication tolerances of specified grade in accordance with AWMAC/WI (NAAWS) requirements including successful casework integrity testing.

B. Flame Retardance: Provide flame-retardant-grade laminates where indicated on drawings.

1. Flame Spread Rating ASTM E84: Provide units bearing the label of Underwriters' Laboratories, or other testing agency acceptable to the State Fire Marshal, indicating that the units provide the specified flame spread rating. CBC Table 803.13.

a. Class C Flame spread rating 76-200, smoke developed 0-450 per ASTM E84.

C. High-Pressure Decorative Laminate (HPDL): Sheet consisting of fibrous material impregnated with thermosetting resins; bonded by high-pressure process.

D. HPDL Laminates Less than 0.08 inch Thick: Comply with ISO 4586-3.

1. Horizontal Grades:

a. HPDL HGS; for Horizontal Surfaces applications.

2. Vertical Grades:

a. HPDL VGS; for Vertical Surfaces applications.

3. Postformable Grades:

a. HPDL HGP; for Post-Formed Horizontal Surfaces applications.

4. Exposed Backer Materials:

a. Same materials, thickness and color as laminate face.

5. Concealed Backer Materials:

a. Laminate materials as required for balanced construction panel and recommended by laminate manufacturer for application.

6. Products:
   a. Basis of Design Product: Indicated on Drawings as manufactured by Wilsonart, or approved equal.
   b. Arborite: www.arborite.com/#sle.
      1) Exposed Exterior Surfaces, Color, Pattern, and Finish: As indicated on drawings.
   c. Formica Corporation: www.formica.com/#sle.
      1) Exposed Exterior Surfaces, Color, Pattern, and Finish: As indicated on drawings.
   d. Panolam Industries International, Inc: www.panolam.com/#sle.
      1) Exposed Exterior Surfaces, Color, Pattern, and Finish: As indicated on drawings.
   e. Wilsonart LLC: www.wilsonart.com/#sle.
      1) Exposed Exterior Surfaces, Color, Pattern, and Finish: As indicated on drawings.
   f. Lamin-Art: www.laminart.com.
      1) Exposed Exterior Surfaces, Color, Pattern, and Finish: As indicated on drawings.
   g. Substitutions: See Section 01 60 00 - Product Requirements.

2.07 PANEL CORES

A. Medium Density Fiberboard (MDF):
   1. Description: Composite panel composed of cellulosic fibers, additives, and bonding system cured under heat and pressure; comply with ANSI A208.2.
   2. Grade: 130.
      a. Comply with NAAWS, Grade 150 minimum, where required by CSIP.
   3. Panel Thickness: 3/4 inch.
   4. Moisture Resistance: MR10; color-tinted to indicate moisture-resistance core.
   5. No-Added Formaldehyde Based (NAUF) Resins: Comply with CARB (ATCM).
   6. Products:
      a. Basis of Design Material: Combination Core, PureBond Classic Core, www.columbiaforestproducts.com, or approved equal.
      b. Roseburg Forest Products: www.roseburg.com/#sle.
      c. Timber Products; Pro Core MDF: www.timberproducts.com.
      d. Substitutions: See Section 01 60 00 - Product Requirements.

B. Medium Density Overlay (MDO):
   1. Description: General plywood with thermosetting phenolic resin impregnated cellulose-fiber sheets bonded to both working faces for balanced construction; comply with PS 1 for MDO General.
   2. Performance Category: As required to meet performance requirements for specified applications.

3. Panel Grade: MDO General; B-B.
4. Products:
    a. Roseburg Forest Products: www.roseburg.com/#sle.
    b. Substitutions: See Section 01 60 00 - Product Requirements.

2.08 CONCEALED CABINET BASE COMPONENTS

A. Cabinet Base Toe-Kick Subfronts:
    1. Materials: Moisture-resistant wood boards.
    2. Height Above Subfloor: 4 inches.
    3. Finished Face of Toe Kick Subfronts: As indicated on drawings.
B. Cabinet Base Blocking and Stretchers:
    1. Materials: Fabricator's option.
    2. Size: As indicated on drawings.
C. Cabinet Base Sleepers:
    1. Materials: Wood boards.
    2. Height Above Subfloor: 4 inches.

2.09 WOOD AND WOOD-BASED MATERIALS

A. AWMAC/WI (NAAWS) Wood Moisture Content Requirements:
    1. Dry Southwestern US: Between 4 and 9 percent.
B. AWMAC/WI (NAAWS) General Requirements for Wood:
    1. Provide wood that is sound, free of decay, shake, pith, wane, and warp.
    2. Comply with AWMAC/WI (NAAWS) and with specified performance requirements.
C. Plywood: Comply with PS 1.
    1. Structural I, Grade C-D, Exposure I.
    2. Performance Category: 3/4 minimum.
D. Wood Boards: Comply with PS 20.
    1. Thickness: As specified with applicable casework components.
E. Moisture-Resistant Wood: Where moisture-resistant wood is specified or indicated on drawings for cabinet base components, provide wood with thickness swelling of not more than 5 percent when tested in accordance with ASTM D1037.
F. Wood Anchoring Strips:
    1. Materials: Wood boards.
    2. Size: As indicated on drawings.
    3. Application: As indicated on drawings.

2.10 CABINET AND DRAWER HARDWARE

A. Hinges, Number of Hinges for Each Cabinet Door:

1. Door Heights Under 48 inches: Not less than two hinges per door.
2. Door Heights Between 48 inches and 84 inches: Not less than three hinges per door.
3. Door Heights Greater than 84 inches: Not less than four hinges per door.

B. Hinges, Self-Closing, Integrated Damper Hinges:
1. Description: Self-closing hinges with integrated damper mechanisms.
2. Comply with BHMA A156.9, B01712.
3. Features: Provide soft-closing integrated damper hinges.
4. Opening Range: Between 115 to 150 to degrees.
5. Material and Finish: Steel with polished finish.
6. Products:
   a. Blum, Inc: www.blum.com/#sle.
   b. Grass America Inc: www.grassusa.com/#sle.
   c. Hafele America Co.; : www.hafele.com.
   d. Hettich America, LP: www.hettich.com/#sle.
   e. Stanley Hardware Div.: www.stanleycommercialhardware.com.
   f. Substitutions: See Section 01 60 00 - Product Requirements.

C. Cabinet Door and Drawer Pulls: Provide one at each door and drawer.
1. Comply with CBC 11B-811.4.
2. Description: Back-mounted pulls.
3. Provide one pull for each drawer 24 inches or less in width.
4. Provide two pulls for each drawer over 24 inches in width.
5. Comply with BHMA A156.9, B02011.
6. Design: U-shape wire pulls.
7. Center-to-Center Mounting Dimension: 4 inches.
8. Material and Finish: Steel with polished finish.
9. Products:
   a. Doug Mockett & Company, Inc: www.mockett.com/#sle.
   b. Amerock: BP76312-G10, 4 inch Pull, Allison Value Hardware
   c. Rockler: Satin Nickel 4 inch Wire Pull.
   d. Top Knob: M338 - Wire Pull 4 inch - Brushed Satin Nickel - Somerset Collection.
   e. Substitutions: See Section 01 60 00 - Product Requirements.

D. Cabinet Magnetic Catches:
1. Description: Fastening devices with magnetic holding capacities that keep cabinet doors closed until pulling actions release doors for opening.
2. Provide one catch for each swinging door 48 inches and less in height.
3. Provide two catches for each swinging door over 48 inches in height.

4. Magnetic Catches for Under Overlay Doors:
    a. Comply with specified performance requirements.
5. Material and Finish: BHMA A156.18, 626 or 652 satin chromium.
6. Products:
    a. Ives, an Allegion brand: www.allegion.com/us/#sle.
    b. Knape & Vogt Manufacturing Company: www.knapeandvogt.com/#sle.
    c. Sugatsune America, Inc: www.sugatsune.com/#sle.
    d. Substitutions: See Section 01 60 00 - Product Requirements.

E. Cabinet Latches:
1. Description: Fastening devices with holding capacities that keep cabinet doors closed until specific actions release doors for opening; some latches release doors by push-to-open actuation.
2. Comply with specified performance requirements.
3. Comply with BHMA A156.18.
4. Latches: Touch latches.
5. Material and Finish: BHMA A156.18, 626 or 652 satin chromium.
6. Products:
    a. Knape & Vogt Manufacturing Company: www.knapeandvogt.com/#sle.
    b. Sugatsune America, Inc: www.sugatsune.com/#sle.
    c. Substitutions: See Section 01 60 00 - Product Requirements.

F. Shelf Rests:
1. Description: Shelf rests for installation into prepared holes in substrate.
2. Comply with specified performance requirements.
3. Comply with BHMA A156.9, B04013.
4. Products:
    a. Locking 3/4-inch plastic shelf supports for 5 mm hole diameter: Knape & Vogt Manufacturing Company; No. 339: www.knapeandvogt.com/#sle.
    b. Substitutions: See Section 01 60 00 - Product Requirements.

G. Adjustable Shelf Support Systems, Standards and Shelf Rests: Provide where indicated on drawings.
1. Description: Slotted vertical standards with shelf rests for supporting shelves; standards mounted in evenly spaced, cleanly bored holes.
2. Load Capacity: Comply with with specified structural performance duty level.
3. Adjustment Increment: 1-1/4 inches.
4. Standard Length: As indicated on drawings.
5. Surface-Mounted Standards: Comply with BHMA A156.9, B04063.
6. Material and Finish: Satin chromium-plated nickel.

7. Products:
    a. Knape & Vogt Manufacturing Company: www.knapeandvogt.com/#sle.
    b. Sugatsune America, Inc: www.sugatsune.com/#sle.
    c. Substitutions: See Section 01 60 00 - Product Requirements.

H. Standards and Shelf Support Brackets: Provide where indicated on drawings.
1. Description: Single-slotted vertical standards and shelf-support brackets.
2. Comply with specified performance requirements.
3. Adjustment Increment: 1-1/4 inches.
4. Standards: Comply with BHMA A156.9, B04103.
5. Shelf Brackets: Comply with BHMA A156.9, B04112.
6. Material and Finish: Satin chromium-plated nickel.
7. Products:
    a. Knape & Vogt Manufacturing Company: www.knapeandvogt.com/#sle.
    b. Sugatsune America, Inc: www.sugatsune.com/#sle.
    c. Substitutions: See Section 01 60 00 - Product Requirements.

I. Drawer Slides:
1. Description: Hardware units that suspend drawers and provide controlled drawer sliding.
2. Comply with specified performance requirements.
3. Comply with BHMA A156.9, Standard Duty Grade 1.
    a. Static Load Capacity: As required by drawer size.
        1) For drawers up to 18 inches wide and less than 4 inches in depth, provide slides with 100 pound capacity.
        2) For drawers over 18 inches in width and over 4 inches in depth, provide slides with 150 pound capacity.
        3) Drawer slide capacity with paper storage: 200 pounds.
4. Features: Self-closing and soft-closing.
5. Mounting: Side-mounted self-closing.
6. Travel: Full extension with overtravel, no deflection.
7. Material and Finish: BHMA A156.18, 626 or 652 satin chromium.
8. Products:
    a. Accuride International, Inc; Light-Duty Drawer Slides: www.accuride.com/#sle.
    b. Accuride International, Inc; Heavy-Duty Drawer Slides: www.accuride.com/#sle.
    c. Blum, Inc; MOVENTO: www.blum.com/#sle.
    d. Blum, Inc; TANDEM: www.blum.com/#sle.
    e. Grant Hardware Company, Division of Hettich International: www.hettichamerica.com.

f. Hafele America Co.

g. Hettich America, LP: www.hettich.com/#sle.

h. Knape & Vogt Manufacturing Company; Light-Duty Drawer Slides: www.knapeandvogt.com/#sle.

i. Knape & Vogt Manufacturing Company; Medium-Duty Drawer Slides: www.knapeandvogt.com/#sle.

j. Knape & Vogt Manufacturing Company; Heavy-Duty Drawer Slides: www.knapeandvogt.com/#sle.

k. Substitutions: See Section 01 60 00 - Product Requirements.

J. Cabinet Door and Drawer Silencers:

1. Description: Self-adhesive rubber silencers.
2. Doors, Quantity: One silencer at top and bottom of closing edge of each door.
3. Drawers, Quantity: One silencer at back side of each drawer front cover.
4. Size: 1/4 inch diameter; 1/8 inch projection.
5. Color: As selected from manufacturer's standards.
6. Products:
   a. Ives, an Allegion brand: www.allegion.com/us/#sle.
   b. Substitutions: See Section 01 60 00 - Product Requirements.

K. Keyed Cabinet Locks: Keyed cylinder, two keys per lock, master keyed, steel with satin finish.

1. Provide locks on all cabinet doors and drawers, except accessible sink bases, and as follows:
   a. Work Area.
   b. "Personal" Drawers.
   c. Filing Cabinets.
   d. Workrooms to have locks on all doors and drawers.
2. Key locks alike for doors and drawers for each room and master keyed.
3. Master key project in accordance with District's keying requirements.
   a. Ccoordinate with District's keying at a keying meeting held with the Owner Representative.
   b. Provide for the District's review a keying schedule as part of the final shop drawings.
4. Metal Strike Plates: Provide cabinet door and drawer locks with metal strike plates to protect against particle board rip out.
5. Door and drawer locks shall be of pin tumbler design and include working cylinder slides and forwardly removable cylinder to re-key without totally disassembling lock body and passed by ANSI Grade 1 testing.
6. Locks shall be easily rekeyable pin tumbler with working top slide and retainer staple.

L. Cabinet Door Keyed Locks with Dead Bolts with Strike Plates:

1. Description: Keyed cylinder locks for securing cabinet doors.

2. Keying Action: Key projects and retracts dead bolts.
    a. Not acceptable: Cam type locks.
3. Mounting: Surface mounted.
    a. Comply with BHMA A156.11, E07121.
4. Interchangeable Cores: Provide interchangeable cores.
5. Material and Finish: Satin chromium-plated nickel, 26D.
6. Products:
    a. Basis of Design: 5-pin tumbler, complying with ANSI/BHMA A156.11, Grade 1 manufactured by Olympus Lock.
    b. Olympus Lock; 500DR : www.olympuslock.com.
    c. Corbin Cabinet Lock; 0737 Drawer Lock : www.cclsecurity.com.
    d. Substitutions: See Section 01 60 00 - Product Requirements.

M. Cabinet Door Keyed Locks with Latch Bolts with Strike Plates:
1. Description: Keyed locks for securing cabinet doors.
2. Keying Action: Key retracts latch bolt.
3. Mounting: Half-mortised into back if door.
4. Comply with specified performance requirements.
5. Interchangeable Cores: Provide interchangeable cores.
6. Key Control: See Section 08 71 00.
7. Material and Finish: BHMA A156.18, 626 or 652 satin chromium.
8. Products:
    a. Olympus Lock; 100DR : www.olympuslock.com.
    b. Corbin Cabinet Lock; 0738 Drawer Lock : www.cclsecurity.com.
    c. Substitutions: See Section 01 60 00 - Product Requirements.

2.11 CASEWORK ACCESSORY COMPONENTS

A. Edgebanding: PVC, flat, matte finish; width to match component thickness.
1. Color: As selected by Architect from manufacturers' standard range.

B. Aluminum Trim and Mouldings: Extruded, alloy 6063 T5.
1. Type: Profile as selected from manufacturer's standard range.
2. Depth: 3/4 inch.
3. Finish: Clear anodized.
4. Products:
    a. BM-1 Basis of Design Product: Millwork Trims indicated on Drawings as manufactured by Fry Reglet, fryreglet.com, or equal.
    b. Substitutions: See Section 01 60 00 - Product Requirements.

C. Grommets: Plastic, with matching slotted caps; round.

1. Applications: Where indicated on drawings.
2. Shape: Round.
3. Basis of Design Product: TG Flip-Top® Series as manufactured by Doug Mocket & Company, Inc., or approved equal.
    a. Application: desk, countertop, or worksurface grommets.
    b. Hole Diameter: 3 inches.
    c. Type: Flip Top.
    d. Color as selected by Architect.
    e. Location as directed by Architect or District. Final location and color to be indicated on shop drawing submittal.
4. Products:
    a. Basis of Design Product: As indicated on Drawings as manufactured by Doug Mockett & Company, Inc, or equal.
    b. Doug Mockett & Company, Inc: www.mockett.com/#sle.
    c. Substitutions: See Section 01 60 00 - Product Requirements.

2.12 ACCESSORIES

A. Fasteners: Size and type to suit application.

B. Concealed Joint Fasteners: Threaded steel.

C. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; galvanized or chrome-plated finish in concealed locations and stainless steel or chrome-plated finish in exposed locations.

D. Adhesives: Type recommended by fabricator to suit application.
    1. Products:
        a. Franklin International, Inc; TiteBond Original Wood Glue: www.titebond.com/#sle.
        b. Substitutions: See Section 01 60 00 - Product Requirements.

2.13 FABRICATION

A. Shop-fabricate casework to dimensions, profiles, and details indicated on drawings.
    1. Fabricate to maximum extents plausible, including doors, drawers, and hardware; fabricate units in sizes transportable through building openings.

B. When necessary to cut and fit on site, provide materials with sufficient allowance for cutting.

C. Wood Casework with Laminate Cladding: Apply laminates in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline.

D. Provide cutouts for outlet boxes, inserts, similar items, and hardware; verify locations of cutouts from on-site dimensions. Sand and seal cut edges.

E. Edgebanding: Apply where specified; do not use more than one piece for any single length.

F. Hardware: Install hardware in accordance with hardware manufacturer's written instructions; use fasteners supplied by hardware manufacturer.

G. Glazing: Install glass products with dry glazing method using soft, closed-cell gaskets in accordance with GANA (GM).
    1. Polish and grind exposed glass edges.
H. WI Certified Compliance Labels: Indicate compliance with WI Certified Compliance Program by applying WI Certified Compliance Labels on each casework elevation.
I. Fabrication Tolerances: Comply with specified performance requirements.

2.14 SOURCE QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements for additional requirements.
B. Inspection Services: Provide WI QCP fabrication inspection services.
    1. Inspect for compliance with contract documents; on subjects that contract documents are silent, inspect for compliance with specified AWI grade.
    2. Provide report of inspection results first to architectural woodwork fabricator. After ten days, provide updated report to Architect, District, and Contractor.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify casework and materials required for installation have been delivered, handled and stored as specified.
B. Verify wood blocking that provides casework backing is installed as indicated on drawings.
C. Verify location and sizes of rough-in electrical associated with work of this section.
D. Verify location and sizes of cutouts for appliances and special equipment to be mounted in or adjacent to casework.

3.02 PREPARATION

A. Acclimate casework to environments indicated for installation.

3.03 INSTALLATION

A. Install and secure work of this section in accordance with specified performance requirements.
B. Install work of this section rigid, plumb, and level and in accordance with fabricator's documented instructions; secure casework as indicated on drawings.
    1. Align and secure adjoining cabinet units with fasteners in concealed locations.
C. Base and Wall Cabinet Anchorage Support Construction:
    1. See Section 06 10 00 for load-bearing wood stud framing, in-wall blocking, and furring providing backing, support, and structural support for casework.
D. Install cabinet hardware in accordance with hardware manufacturer's documented instructions using hardware manufacturer's furnished fasteners.
E. Install scribe fillers to close gaps between casework and adjacent walls.

3.04 TOLERANCES

A. Comply with specified performance requirements for tolerances.

3.05 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements for additional requirements.

B. WI Inspection Services: Provide WI Seismic Installation Services; inspect casework backing for compliance with project-specific seismic requirements.

3.06 ADJUSTING

A. Adjust hardware for smooth operation in accordance with hardware manufacturer's documented instructions.

3.07 CLEANING

A. See Section 01 70 00 - Execution and Closeout Requirements for additional requirements.

B. Clean exposed surfaces of casework, shelving, and hardware.

3.08 PROTECTION

A. Protect installed casework from subsequent construction operations.

END OF SECTION

SECTION 07 05 53
FIRE AND SMOKE ASSEMBLY IDENTIFICATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Identification markings for fire and smoke rated partitions, and fire rated walls.

1.02 RELATED REQUIREMENTS

A. Section 09 91 23 - Interior Painting: Paint finish.

1.03 REFERENCE STANDARDS

A. CBC - California Building Code.

1. Section 703.5 Marking and Identification.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's printed product literature for each type of marking, indicating font, foreground and background colors, wording, and overall dimensions.

C. Schedule: Completely define scope of proposed marking, and indicate location of affected walls and partitions, and number of markings.

D. Samples: Submit two samples of each type of marking proposed for use, of size similar to that required for project, illustrating font, wording, and method of application.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

1.06 FIELD CONDITIONS

A. Do not install adhered markings when ambient temperature is lower than recommended by label or sign manufacturer.

B. Do not install painted markings when ambient temperature is lower than recommended by coating manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Partition Identification Labels:

1. Fire Wall Signs, Inc: www.firewallsigns.com.
2. Safety Supply Warehouse, Inc: www.safetysupplywarehouse.com.
3. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 FIRE AND SMOKE ASSEMBLY IDENTIFICATION

A. Regulatory Requirements: Comply with "Marking and Identification" requirements of "Fire-Resistance Ratings and Fire Tests" chapter of the building code.

B. Adhered Fire and Smoke Assembly Identification Signs: Printed vinyl sign with factory applied adhesive backing.

1. Size: 11 by 15 inches, nominal.
2. Not Less than 3 inch high letters with with minimum 3/8 inch stroke in a contrasting color.
3. Suggested Text:
    a. 1 HOUR FIRE/SMOKE BARRIER - PROTECT ALL OPENINGS AND PENETRATIONS"

C. Applied Fire and Smoke Assembly Identification: Identification markings applied to partition with paint and a code compliant stencil. See Section 09 91 23 for products.

D. Languages: Provide sign markings in English.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are ready to receive work.

3.02 PREPARATION

A. See Section 09 91 23 for substrate preparation for painted markings.

3.03 INSTALLATION

A. Locate markings as required by {\rs\#1} Section 703.7; measured horizontally along wall or partition.

1. Place on fire walls in accessible concealed floor, floor-ceiling, or attic space above accessible ceiling.
2. Within 15 feet from the end of each wall.
3. Maximum interval of 30 feet.

B. Install adhered markings in accordance with manufacturer's instructions.

C. Install applied markings in accordance with Section 09 91 23.

D. Install neatly, with horizontal edges level.

E. Protect from damage until Date of Final Inspection; repair or replace damaged markings.

END OF SECTION

SECTION 07 62 00
SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fabricated sheet metal items, including flashings, counterflashings, gutters, downspouts, exterior penetrations, and other items indicated in Schedule.

B. Sealants for joints within sheet metal fabrications.

C. Sheet metal splash pans.

1.02 RELATED REQUIREMENTS

A. Section 09 91 13 - Exterior Painting: Field painting.

1.03 REFERENCE STANDARDS

A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix).

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

C. ASTM B32 - Standard Specification for Solder Metal.

D. ASTM C920 - Standard Specification for Elastomeric Joint Sealants.

E. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension.

F. ASTM D638 - Standard Test Method for Tensile Properties of Plastics.

G. ASTM D792 - Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement.

H. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.

I. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness.

J. ASTM D3161/D3161M - Standard Test Method for Wind Resistance of Steep Slope Roofing Products (Fan-Induced Method).

K. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement.

L. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials.

M. ICC-ES AC188 - Acceptance Criteria for Roof Underlayments.

N. SMACNA (ASMM) - Architectural Sheet Metal Manual.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.

C. Samples: Submit two samples 6 x 6 inch in size illustrating metal finish color.

1.06 QUALITY ASSURANCE

A. Perform work in accordance with SMACNA (ASMM) requirements and standard details, except as otherwise indicated.

B. Maintain one copy of each document on site.

C. Fabricator andInstaller Qualifications: Company specializing in sheet metal work with five years ofdocumented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

A. See Section 01 74 19 - Construction Waste Management and Disposal for packaging waste requirements.

B. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.

C. Prevent contact with materials that could cause discoloration or staining.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Exterior Penetration Flashing Panel:

1. Quickflash Weatherproofing Products, Inc: www.quickflashproducts.com/#sle.

2.02 SHEET MATERIALS

A. Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24-gauge, 0.0239-inch thick base metal.

2.03 FABRICATION

A. Form sections true to shape, accurate in size, square, and free from distortion or defects.

1. Coping and Cap Flashing:

a. Coping and caps of type and profile indicated on Drawings, 20 gage galvanized sheet metal, with integral expansion.

2. Drips at Doors and Windows:

a. Provide 20 gage galvanized sheet metal drips at head of all exterior doors and windows where no roof or overhang protection occurs.

b. Extend drips 2 inches beyond jambs, unless noted otherwise.

B. Perimeter metal blocking system:

1. Basis of Design Product: EdgeBox RI as manufactured by Hickman Edge Systems, or equal.
2. Two-piece assembly shall be fabricated from 20 Ga. galvanized steel with pre- punched fastener holes. The bottom section is attached to the metal deck with the provided mechanical fasteners. No slots are necessary for use with rigid insulation. Install per manufacturer's written instructions.

C. Fabricate cleats of same material as sheet, minimum 4 inches wide,except at continuous strips, interlocking with sheet.
   1. Typically use continuous strips.

D. Form pieces in longest possible lengths.

E. Hem exposed edges on underside 1/2 inch; miter and seam corners.

F. Form material with flat lock seams, except where otherwise indicated; at moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.
   1. Typical Seams: Overlapped and sealed seams.
   2. Coping Seams: Lock seams, flattened.
   3. Seams, Horizontal to Vertical Transitions: Solder joints.
   4. Soldered seams: Tin edges to be seamed, form seams, and solder.

G. Fabricate corners from one piece with minimum 18-inch long legs; seam for rigidity, seal with sealant.

H. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.

I. Fabricate flashings to allow toe to extend 2 inches over roofing gravel. Return and brake edges.

2.04 GUTTERS AND DOWNSPOUTS

A. Gutters: SMACNA (ASMM) Rectangular profile.

B. Downspouts: Profile as indicated.
   1. Steel Pipe Downspouts: See section 05 50 00 - Metal Fabrications.
      a. Provide steel pipe downspouts where indicated. Fabricate from galvanized, Schedule 40 steel pipe or tube of sizes indicated. Weld joints and grind smooth. Shop prime with zinc-rich primer for field painting.
      b. Provide necessary transitions from steel pipe to gage metal roof gutters and gutter outlets.
      c. Hold downspouts in position 1 inch clear of walls with galvanized steel straps at spacing indicated, securely fastened to wall.
         1) Provide heavy duty mounting bracket hardware for attachment to structural steel.

C. Scuppers and Overflows: 24 gage galvanized sheet metal, as indicated on Drawings and complying with referenced SMACNA Manual Figure number. Fabricate with minimum 6 inch flanges.

D. Gutters and Downspouts: Size indicated on drawings.

E. Accessories: Profiled to suit gutters and downspouts.
   1. Anchorage Devices: In accordance with SMACNA (ASMM) requirements.
   2. Gutter Supports: Straps.
   3. Downspout Supports: Straps.
   4. Strainers 10 gage galvanized steel wire basket type, riveted and soldered into place.

F. Splash Pans: Same metal type as downspouts, formed to 12 x 18 inches size; rolled sides of 1 inch high for inverted pan placement.

G. Splash Pads: Precast concrete type, of size and profiles indicated; minimum 3,000 psi at 28 days, with minimum 5 percent air entrainment.

H. Downspout Boots: Steel.

I. Downspout Extenders: Same material and finish as downspouts.

J. Seal metal joints.

2.05 FLASHING

A. Flashing Panels for Exterior Wall Penetrations: Premanufactured components and accessories as required to preserve integrity of building envelope; suitable for conduits and facade materials to be installed.

B. Basis of Design Product: Quickflash Weatherproofing Flashing Panels as manufactured by Quickflash Weatherproofing Products, Inc., www.quickflashproducts.com, or equal.

C. Coordinate with each trade to provide specific models correctly sized for each individual pipe, duct, conduit, box, or panel penetration in each application as occurs in the building envelope.

D. Plumbing Flashing Panels:
   1. Materials:
      a. Panel: Combination of high-density polyethylene (HDPE) and low-density polyethylene (LDPE).
         1) HDPE, Specific Gravity, ASTM D1505: 0.953 g/cm3.
         2) HDPE, Tensile Strength at Yield, ASTM D638: 3,100 psi.
         3) LDPE, Specific Gravity, ASTM D792: 0.917 g/cm3.
         4) LDPE, Tensile Strength at Yield, ASTM D638: 1,300 psi.
      b. Weatherproof Seal: Thermoplastic elastomer.
         1) Hardness, ASTM D2240, Shore A, 10 Seconds: 46.
         2) Specific Gravity, ASTM D792: 1.05 g/cm3.
         3) Tensile Strength, ASTM D412: 490 psi.

E. Electrical Flashing Panels:
   1. Material: Thermoplastic elastomer.
      a. Hardness, ASTM D2240, Shore A, 10 Seconds: 93.
      b. Specific Gravity, ASTM D792: 1.05 g/cm3.
      c. Tensile Strength, ASTM D412: 1,300 psi.

2.06 ACCESSORIES

A. Fasteners: Galvanized steel, with soft neoprene washers.

B. Miscellaneous Metal Accessories: Provide sheet metal clips, straps, anchoring devices, and similar accessory units as required for installation of the Work, matching or compatible with material being installed, non-corrosive, size and gage required for performance.

C. Underlayment: Self-adhering rubber-modified asphalt sheet (SASM, Self-Adhered Sheet Membrane) complying with ASTM D1970/D1970M; 40 mil total thickness; with strippable release film and woven polypropylene sheet top surface.

1. Minimum Requirements: Comply with requirements of ICC-ES AC188 for non-self-adhesive sheet.
2. Sheet Thickness: 40 mil (0.040 inch) minimum total thickness.
3. Self Sealability: Nail sealability in accordance with ASTM D1970/D1970M.
4. Low Temperature Flexibility: Comply with ASTM D1970/D1970M.
5. Water Vapor Permeance: 0.067 perm, maximum, when tested in accordance with ASTM E96/E96M Procedure A (desiccant method).
6. Functional Temperature Range: Minus 45 degrees F to 250 degrees F.
7. Products:
    a. Certainteed Roofing; WinterGuard HT - High Temperature Waterproofing Underlayment: www.certainteed.com/#sle.
    b. CETCO; Product Strong Seal SA; www.cetco.com.
    c. Henry, a Carlisle Company; Blueskin PE200HT: www.henry.com/#sle.
    d. Protecto Wrap Company: www.protectowrap.com/#sle.
    e. InterWrap, Inc. Mission, BC Canada; Product Titanium-PSU-30; www.interwrap.com.
    f. Soprema, Inc.; Product Lastobond Shield HT MU; (951) 212-4542, www.soprema.us.
    g. WR Grace; Product Grace Ultra; www.na.graceconstruction.com.
    h. Substitutions: See Section 01 60 00 - Product Requirements.

D. Slip Sheet: Rosin-sized sheathing paper.

E. Primer Type: Zinc chromate.

F. Concealed Sealants: Non-curing butyl sealant.

G. Exposed Sealants: ASTM C920; elastomeric sealant, with minimum movement capability as recommended by manufacturer for substrates to be sealed; color to match adjacent material.

1. Epoxy Seam Sealer: 2-part non-corrosive metal seam cementing compound, recommended by metal manufacturer for exterior/interior non-moving joints including riveted joints.

H. Asphalt Roof Cement: ASTM D4586/D4586M, Type I, asbestos-free.

I. Reglets: Surface-mounted type, galvanized steel; face and ends covered with plastic tape.

1. Reglets:
    a. Surface-applied, Fry Springlok Flashing System Type SM, or equal.

b. Recessed, Fry Springlok Flashing System Type ST, or equal.

2. Performance Requirements

a. Reglet and flashing manufacturer shall certify that the system to be installed has been tested to resist 110 MPH wind loads when tested in accordance with ASTM D3161/D3161M for a minimum period of two hours.

3. Specified Manufacturer: Fry Reglet Corporation, www.fryreglet.com.

4. Acceptable Manufacturers:

a. O'Keefes, Inc., www.okeefes.com.

b. Substitutions: See Section 01 60 00 - Product Requirements.

5. Reglets and Flashing, General: Springlok Flashing, as manufactured by Fry Reglet Corporation, or equal, formed metal reglet with snap-in metal counter-flashing, factory-fabricated, with a minimum opening of 1/4 inch and a depth of 1-1/4 inches.

a. Reglet material: 24 gage galvanized steel.

b. Flashing material: 0.020 inch Type 302 stainless steel.

c. End laps: Factory-formed, 1 inch at reglets and 3 inches at flashings.

d. Corners: Provide built-up mitered corner pieces for internal and external angles.

e. Wind clips: Provide Fry Windlok Clip, sheet metal clips to be secured to wall prior to installing flashing in reglet, and to be bent up over bottom edge of flashing.

6. Accessories:

a. Corners: Factory-manufactured, mitered inside and outside corners.

b. Splices: Factory-manufactured, integral component of reglet and flashing system.

J. Solder: ASTM B32, Alloy Grade - Sn50 (50/50).

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.

B. Verify roofing termination and base flashings are in place, sealed, and secure.

3.02 PREPARATION

A. Install starter and edge strips, and cleats before starting installation.

B. Install surface mounted reglets true to lines and levels, and seal top of reglets with sealant.

C. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil, 0.015 inch.

3.03 INSTALLATION

A. Insert flashings into reglets to form tight fit; secure in place with plastic wedges; pack remaining spaces with mineral wool; seal flashings into reglets with sealant.

B. Secure flashings in place using concealed fasteners, and use exposed fasteners only where permitted.

C. Apply plastic cement compound between metal flashings and felt flashings.

D. Fit flashings tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles.

1. Counterflashings Installation: Install counterflashing in reglets to form tight fit, either by snap-in seal arrangement or by securing in place with plastic wedges spaced 18 inches on center maximum. Pack remaining spaces with mineral wool.

a. Except where indicated or specified otherwise, insert counterflashing in reglets, extending down vertical surfaces over upturned vertical leg of base flashings not less than 3 inches.

b. Form counterflashings to required shapes before installation.

c. Lengths of metal counterflashings shall not exceed 120 inches.

d. Where stepped counterflashings are required, counterflashing may be installed in short lengths or may be of the preformed one-piece type.

e. Provide factory- or shop-form corners not less than 12 inches from the angle.

f. Provide end laps in counterflashings not less than 3 inches and make laps weathertight with sealant.

g. Turn up concealed edge of counterflashings built into masonry or concrete walls not less than 1/4 inch and extend not less than 2 inches into wall.

h. Fold exposed edges of counterflashings 1/2 inch.

i. Install counterflashing to provide a spring action against base flashing.

2. Thru-Wall Flashing:

a. Start flashing 1/2 inch behind exposed face of wall and extend through wall.

b. Lap-seam joints and seal with sealant.

c. Provide sealant around penetrations through flashing.

E. Seal metal joints watertight.

F. Secure gutters and downspouts in place with concealed fasteners.

G. Connect downspouts to downspout boots, and grout connection watertight.

H. Set splash pans under downspouts. Set in place with adhesive .

I. Scuppers and Overflows Installation:

1. Mechanically fasten and solder joints.

2. Fold outside edges under 1/2 inch on all sides.

3. Join the bottom edge to closure flange, where necessary, and form ridge to act as a gravel stop around scupper inlet.

4. Coat interior of scuppers and overflows with bituminous plastic cement.

J. Metal Flashing at Wall and Roof Penetrations and Equipment Supports:

1. Exception:

a. Roofing: Where single ply system assembly has provided flashing for penetrations.

2. Penetrations through Single Ply (ex; PVC or TPO) membrane:
   a. Roofing contractor is to install Single Ply (ex; PVC or TPO) cones and or flashing per roofing manufacturers standard details.
   b. Roofing contractor is to provide sealant and stainless draw band to seal Single Ply (ex; PVC or TPO) cones and or flashings in accordance with the roofing manufacturer's standard details.
3. Provide metal flashing for all pipes, ducts, and conduits projecting through the roof surface and for equipment supports, guy wire anchors, and similar items supported by or attached to the roof deck or walls.
   a. Goose-necks, rainhoods, power roof ventilators, and other plumbing, HVAC and electrical products are specified as appropriate in:
      1) Division 22 - Plumbing.
      2) Division 23 - Heating, Ventilating, and Air-Conditioning (HVAC).
      3) Division 26 - Electrical.
4. Single Pipe Vents: Provide lead flashing as indicated on Drawings.
   a. Set flange of sleeve in bituminous plastic cement and nail 3 inches on centers.
   b. Bend the top of sleeve over and extend down into the vent pipe a minimum of 2 inches.
   c. For long runs or long rises above the deck, where it is impractical to cover the vent pipe with lead, use a two-piece formed galvanized sheet metal housing.
   d. Set metal housing with a metal sleeve having a 4 inch roof flange in bituminous plastic cement and nailed 3 inches on center.
   e. Extend sleeve a minimum of 8 inches above the roof deck and lapped a minimum of 3 inches by a metal hood secured to the vent pipe by a draw band.
   f. Seal the area of hood in contact with vent pipe with specified sealant. Sealants are specified in Section 07 92 00 - Joint Sealants.
5. Roof Penetration Flashing:
   a. Base Flashing:
      1) Extend flange onto roof 6 inches minimum away from penetration.
      2) Extend flange upward around penetration to at least 8 inches above roofing felts.
      3) Fold back upper and side roof flange edges 1/2 inch minimum.
      4) Lap and solder joints.
   b. Counterflashing: Overlap base flashing 1 inch minimum with storm collar sloped away from penetration. Secure to penetration with draw band and sealant.
6. Equipment Support and Pad Flashing:
   a. Fully cap support and pad.
   b. Overlap base flashing 4 inches.

c. Lap and solder joints.

d. Provide sealant around penetrations through-flashing.

3.04 CLEANING AND PREPARATION FOR FIELD PAINTING

A. Metal Preparation: As sheet metal installation progresses, neutralize excess flux with 5 to 10 percent washing soda solution, and thoroughly rinse.

B. Repairs: Repair or replace damaged and deformed sheet metal.

C. Cleaning: Wash down exposed surfaces and remove stains, scrap and debris such that sheet metal is ready to receive field painting and related Work.

1. Wash down exposed surfaces and remove soiling, dust, contamination from steel wool and drilling residue, and other scrap and debris.

2. Scrub surfaces with detergent solution as necessary to remove grease and oil films, handling marks, and stains.

3.05 FIELD PAINTING

A. Field Painting: Field-paint exposed sheet metal for corrosion resistance and decorative purposes. Field finish painting is specified in Section 09 91 13 - Exterior Painting.

3.06 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements for field inspection requirements.

B. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

3.07 SCHEDULE

A. Fascia and Cornices: Prefinished.

B. Gutters and Downspouts: Prefinished to match adjacent wall color.

C. Scuppers: Thermoplastic membrane cladding, when adjacent to and a part of the roofing.

D. Coping, Cap, Parapet, Sill and Ledge Flashings: Thermoplastic membrane cladding, when adjacent to and a part of the roofing.

E. Flashings Associated with Roofing Tiles, including Valley, Hip, Ridge, Eave, Gutter Edge, Gable Edge, Chimney: Pre-finished

F. Sheet Metal Roof Expansion Joint Covers, and Roof-to-Wall Joint Covers: Pre-finished to match adjacent wall color.

G. Counterflashings at Roofing Terminations (over roofing base flashings): Thermoplastic membrane cladding.

H. Counterflashings at Curb-Mounted Roof Items: Exposed galvanized, when behind a parapet; pre-finished otherwise

I. Roofing Penetration Flashings, for Pipes, Structural Steel, and Equipment Supports: Exposed galvanized, when behind a parapet; pre-finished otherwise.

END OF SECTION

SECTION 07 84 00
FIRESTOPPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Firestopping systems.

B. Firestopping of joints and penetrations in fire-resistance-rated and smoke-resistant assemblies, whether indicated on drawings or not, and other openings indicated.

1.02 RELATED REQUIREMENTS

A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 01 70 00 - Execution and Closeout Requirements: Cutting and patching.

C. Section 07 05 53 - Fire and Smoke Assembly Identification.

D. Section 09 21 16 - Gypsum Board Assemblies: Gypsum wallboard fireproofing.

1.03 REFERENCE STANDARDS

A. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.

B. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems.

C. ASTM E1966 - Standard Test Method for Fire-Resistive Joint Systems.

D. ASTM E2174 - Standard Practice for On-Site Inspection of Installed Firestop Systems.

E. ASTM E2307 - Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-Story Test Apparatus.

F. ASTM E2393 - Standard Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers.

G. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.

H. CBC - California Building Code.

I. FM (AG) - FM Approval Guide.

J. FM 4991 - Approval Standard of Firestop Contractors.

K. ITS (DIR) - Directory of Listed Products.

L. Firestop Contractors International Association (FCIA): M.O.P. Manual of Practice.

M. International Firestop Council (IFC); www.firestop.org:

1. Reference 1: Recommended IFC Guidelines for Evaluating Firestop Engineering Judgments.
2. Reference 2: Inspectors Pocket Guide; Fifth Edition.

N. SCAQMD 1168 - Adhesive and Sealant Applications.

O. UL (FRD) - Fire Resistance Directory.

P. UL 263 - Standard for Fire Tests of Building Construction and Materials.

Q. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials.

R. UL 1479 - Standard for Fire Tests of Penetration Firestops.

S. UL 2079 - Standard for Tests for Fire Resistance of Building Joint Systems.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Schedule of Firestopping: List each type of penetration, fire rating of the penetrated assembly, and firestopping test or design number.

C. Product Data: Provide data on product characteristics, performance ratings, and limitations.

D. Sustainable Design Submittal: Submit VOC content documentation for nonpreformed materials.

E. Manufacturer's Installation Instructions: Indicate preparation and installation instructions.

F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

G. Certificate from authority having jurisdiction indicating approval of materials used.

H. Manufacturer's qualification statement.

I. Installer's qualification statement.

1.05 QUALITY ASSURANCE

A. Provide products for all trades from the same manufacturer to the greatest extent possible and from the same supplier/distributor.

B. Fire Testing: Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with methods indicated.

1. Listing in UL (FRD), FM (AG), or ITS (DIR) will be considered as constituting an acceptable test report.

2. Valid evaluation report published by ICC Evaluation Service, Inc. (ICC-ES) at www.icc-es.org will be considered as constituting an acceptable test report.

3. Submission of actual test reports is required for assemblies for which none of the above substantiation exists.

C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1. One firestop manufacturer shall be used for the entirety of applications on this project unless otherwise approved by the Architect. The manufacturer will be required to furnish UL tested systems for all applications pertaining to the project, and other relevant information.

a. Materials of different manufacture than allowed by the tested and listed system shall not be intermixed in the same firestop system or opening.

b. Tested and listed firestop systems are to be used before an Engineering Judgment (EJ) or Equivalent Fire Resistance Rated Assembly (EFRRA) is installed.

2. A manufacturer's knowledgeable direct representative (manufacturer authorized; distributor, independent representative, manufacturer's representative, or agent) to be on-site during initial installation of firestop systems to train appropriate contractor personnel in proper selection and installation procedures. This will be done per manufacturer's written recommendations published in their literature and drawing details.

D. Installer Qualifications: Company specializing in performing the work of this section and:

1. Trained by manufacturer.
2. Approved by Factory Mutual Research Corporation under FM 4991, or meeting any two of the following requirements:
    a. UL Qualified Firestop Contractor
    b. Verification of minimum three years documented experience installing work of this type.
    c. Shown to have successfully completed not less than 5 comparable scale projects.
    d. Verification of at least five satisfactorily completed projects of comparable size and type.
    e. Firestop Contractors International Association Contractor Member in good standing.
    f. Licensed by local authorities having jurisdiction (AHJ).

1.06 SEQUENCING AND SCHEDULING

A. Project coordination is essential to inform and educate all the parties involved with the firestopping process of their role and how they can affect firestopping on the project. A pre-construction meeting shall be scheduled and required for all parties involved prior to the start of construction.

B. Do not cover up firestopping installations until District's inspection agency or the Authorities Having Jurisdiction have examined each installation.

1.07 MOCK-UPS

A. See Section 01 40 00 - Quality Requirements for additional requirements.

B. Install one firestopping assembly representative of each fire rating design required on project.

1. Where one design may be used for different penetrating items or in different wall constructions, install one assembly for each different combination.
2. Where firestopping is intended to fill a linear opening, install at least 1 linear foot of firestopping.

C. Obtain approval of authorities having jurisdiction (AHJ) before proceeding.

D. If accepted, mock-up will represent minimum standard for this work.

E. If accepted, mock-up may remain as part of this work. Remove and replace mock-ups not accepted.

1.08 FIELD CONDITIONS

A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation; maintain minimum temperature before, during, and for three days after installation of materials.

B. Provide ventilation in areas where solvent-cured materials are being installed.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

A. Firestop System installation must meet requirements of ASTM E814, ASTM E2307, ASTM E1966, UL 263, UL 723, and UL 1479 or UL 2079 tested assemblies that provide a fire rating equal to that of construction being penetrated.

1. Positive pressure in accordance with California Building Code (CBC) for ratings. Reference: CBC Section 714.4.1.2.
2. Comply with UL 2079 for top of wall assemblies.
3. Conform to CBC Section 714.4.1.1 and 714.4.2.

B. For those firestop applications that exist for which no UL tested system is available through any manufacturer, a manufacturer's engineering judgment derived from similar UL system designs or other tests will be submitted to local authorities having jurisdiction for their review and approval prior to installation. Engineer judgment drawings must follow requirements set forth by the International Firestop Council (September 7, 1994).

2.02 MANUFACTURERS

A. Firestopping Manufacturers:

1. Basis of Design: Specified Technologies, Inc: www.stifirestop.com/#sle.
2. 3M Fire Protection Products: www.3m.com/firestop/#sle.
3. A/D Fire Protection Systems Inc: www.adfire.com/#sle.
4. Hilti, Inc: www.us.hilti.com/#sle.
5. Nelson FireStop Products: www.nelsonfirestop.com/#sle.
6. Rectorseal; Bio FireShield and Metacaulk Systems: www.rectorseal.com.
7. Tremco Commercial Sealants & Waterproofing; TREMstop Acrylic: www.tremcosealants.com/#sle.
8. Substitutions: See Section 01 60 00 - Product Requirements.

2.03 MATERIALS

A. Firestopping Materials: Any materials meeting requirements.

B. Volatile Organic Compound (VOC) Content: Provide products having VOC content lower than that required by SCAQMD 1168.

C. Mold and Mildew Resistance: Provide firestopping materials with mold and mildew resistance rating of zero(0) in accordance with ASTM G21.

D. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Provide type of materials as required for tested firestopping assembly.

E. Fire Ratings: Refer to drawings for required systems and ratings.

2.04 FIRESTOPPING SYSTEMS

A. Firestopping: Any material meeting requirements.

1. Fire Ratings: Use system that is listed by FM (AG), ITS (DIR), or UL (FRD) and tested in accordance with ASTM E814, ASTM E119, or UL 1479 with F Rating equal to fire rating of penetrated assembly and minimum T Rating Equal to F Rating and in compliance with other specified requirements.

a. UL runs ASTM E814 under their designation of UL 1479 and publishes the results in their "FIRE RESISTANCE DIRECTORY" that is updated annually with a midyear supplement.

1) Through-Penetration Firestop Devices (XHCR).

2) Fire Resistance Ratings (BXUV).

3) Through-Penetration Firestop Systems (XHEZ).

4) Fill, Voids, or Cavity Material (XHHW).

5) Forming Materials (XHKU).

6) (XHBO)

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify openings are ready to receive the work of this section.

B. Pre-Installation Inspection: Inspect all fire and smoke barriers for penetrations of any type; mark or otherwise identify all penetrations indicating action required: 1) repair; 2) firestopping; or 3) smokestopping.

1. Conduct inspection prior to covering up or enclosing walls or ceilings.

2. Conduct inspection jointly with authorized representative of authority having jurisdiction.

C. If the configuration of a particular penetration does not conform to the configuration necessary for the required firestopping assembly:

1. Notify the installer of the penetration for modification of the configuration to suit the assembly.

2. Do not use the firestopping assembly in other configurations except as specifically stated in the test report or as approved by the authority having jurisdiction.

3.02 PREPARATION

A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other materials that could adversely affect bond of firestopping material.

B. Remove incompatible materials that could adversely affect bond.

C. Install backing materials to prevent liquid material from leakage.

D. Priming:

1. Prime substrates where recommended by firestopping manufacturer using that manufacturer's recommended products and methods.
2. Confine primers to areas of bond.
3. Do not allow spillage and migration onto exposed surfaces.

E. Masking:

1. Use masking tape to prevent firestopping from contacting adjoining surfaces that will remain exposed upon completion of Work.
2. Remove tape as soon as it is possible to do so without disturbing the firestopping seal with substrates.

F. Verify that system components are clean, dry, and ready for installation.

G. Verify that field dimensions are as shown on the Drawings and as recommended by the manufacturer.

H. Prepare penetrations in accordance with the material manufacturer's instructions.

3.03 INSTALLATION

A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.

1. Provide all accessory materials.

B. Firestop Joint Systems:

1. Install joint fillers to provide support of firestop materials during application and at the position required to produce the cross-sectional shapes and depths of installed firestop material relative to joint widths that allow optimum sealant movement capability and develop fire-resistance rating required.
2. Install systems by proven techniques that result in firestop materials:
    a. Directly contacting and fully wetting joint substrates.
    b. Completely filling recesses provided for each joint configuration,
    c. Providing uniform, cross-sectional shapes and depths relative to joint width that optimize movement capability.
3. Tool non-sag firestop materials immediately after their application and prior to the time skinning or begins. Form smooth, uniform beads of configuration indicated or required.
    a. Produce fire-resistance rating
    b. To eliminate air pockets
    c. To ensure contact and adhesion with sides of joint.

C. Penetration Firestops:

1. Coordinate with other trades to assure that all pipes, conduit, cable, and other items, which penetrate fire rated construction, have been permanently installed prior to installation of firestop assemblies.

2. Schedule the work to assure that partitions and all other construction that conceals penetrations are not erected prior to the installation of firestop and smoke seals.
3. Install forming/damming materials and other accessories in accordance with manufacturers written instructions.
4. Install fill materials for through-penetration firestop systems by proven techniques to produce the following results:
    a. Completely fill voids and cavities formed by openings, forming materials, accessories, and penetrating items.
    b. Install materials so they contact and adhere to substrates formed by openings and penetrating items.
5. For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces

D. Remove combustible forming materials, unless they are a required component of the tested assembly.

E. Do not cover installed firestopping until inspected by District's Independent Testing Agency.

F. Do not cover installed firestopping until inspected by authorities having jurisdiction.

G. Install labeling required by code; Section 07 05 53 - Fire and Smoke Assembly Identification.
1. Near fire and smoke barriers, mark each exposed penetration with label identifying it as a fire-stopped or smoke-stopped assembly.

3.04 FIELD QUALITY CONTROL

A. Independent Testing Agency: Inspection agency employed and paid by District, will examine penetration firestopping in accordance with ASTM E2174 and ASTM E2393.
1. Inspection agency to examine firestopping and will determine, in general, that firestopping has been installed in compliance with requirements of tested and listed firestop system, and installation process conforms to FM 4991 - Standard for Approval of Firestop Contractors or UL Qualified Firestop Contractor Program.
2. The inspector shall advise the Contractor of any deficiencies noted within one (1) working day.

B. Repair or replace penetration firestopping and joints at locations where inspection results indicate firestopping or joints do not meet specified requirements.

C. Do not proceed to enclose firestopping with other construction until inspection agency has verified that the firestop installation complies with the requirements.

D. Submit report of inspection to the DSA and Architect.

3.05 CLEANING

A. Hazardous disposal of firestop materials shall be strictly observed as noted on the individual MSDS.

B. Clean adjacent surfaces of firestopping materials.
1. Clean up excess material adjacent to penetrations promptly; use methods and materials approved by the manufacturers of the penetration seals and of surfaces to be cleaned.

3.06 PROTECTION

A. Protect adjacent surfaces from damage by material installation.

B. Protect firestopping during and after curing period from contact with contaminating substances.

C. Protect installed Work from damage from construction operations using substantial barriers as necessary.

D. Repair damaged materials in accordance with manufacturer's instructions.

END OF SECTION

SECTION 07 92 00
JOINT SEALANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Nonsag gunnable joint sealants.

B. Self-leveling pourable joint sealants.

C. Joint backings and accessories.

D. District-provided field quality control.

1.02 RELATED REQUIREMENTS

A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions: Additional requirements for sealants and primers.

1.03 REFERENCE STANDARDS

A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer.

B. ASTM C794 - Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants.

C. ASTM C834 - Standard Specification for Latex Sealants.

D. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications.

E. ASTM C920 - Standard Specification for Elastomeric Joint Sealants.

F. ASTM C1087 - Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems.

G. ASTM C1193 - Standard Guide for Use of Joint Sealants.

H. ASTM C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants.

I. ASTM C1521 - Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints.

J. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension.

K. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness.

L. SWRI (VAL) - SWR Institute Validated Products Directory.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Submit manufacturer's technical datasheets for each product to be used; include the following:

1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.

2. List of backing materials approved for use with the specific product.
3. Backing material recommended by sealant manufacturer.
4. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
5. Substrates the product should not be used on.
6. Substrates for which use of primer is required.
7. Substrates for which laboratory adhesion and/or compatibility testing is required.
8. Installation instructions, including precautions, limitations, and recommended backing materials and tools.
9. Sample product warranty.
10. SWRI Validation: Provide currently available sealant product validations as listed by SWRI (VAL) for specified sealants.

C. Product Data for Accessory Products: Submit manufacturer's technical data sheet for each product to be used, including physical characteristics, installation instructions, and recommended tools.

D. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.

E. Samples for Verification: Where custom sealant color is specified, obtain directions from Architect and submit at least two physical samples for verification of color of each required sealant.

F. Preconstruction Laboratory Test Reports: Submit at least four weeks prior to start of installation.

G. Installation Plan: Submit at least four weeks prior to start of installation.

H. Preinstallation Field Adhesion Test Plan: Submit at least two weeks prior to start of installation.

I. Field Quality Control Plan: Submit at least two weeks prior to start of installation.

J. Preinstallation Field Adhesion Test Reports: Submit filled out Preinstallation Field Adhesion Test Reports log within 10 days after completion of tests; include bagged test samples and photographic records.

K. Installation Log: Submit filled-out log for each length or instance of sealant installed.

L. Field Quality Control Log: Submit filled-out log for each length or instance of sealant installed, within 10 days after completion of inspections/tests; include bagged test samples and photographic records, if any.

M. Manufacturer's qualification statement.

N. Installer's qualification statement.

O. Executed warranty.

1.05 QUALITY ASSURANCE

A. Maintain one copy of each referenced document covering installation requirements on site.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

C. Installer Qualifications: Company specializing in performing the work of this section and with at least three years of documented experience.

D. Preconstruction Laboratory Testing: Arrange for sealant manufacturer(s) to test each combination of sealant, substrate, backing, and accessories.

1. Adhesion Testing: In accordance with ASTM C794.
2. Compatibility Testing: In accordance with ASTM C1087.
3. Allow sufficient time for testing to avoid delaying the work.
4. Deliver sufficient samples to manufacturer for testing.
5. Report manufacturer's recommended corrective measures, if any, including primers or techniques not indicated in product data submittals.
6. Testing is not required if sealant manufacturer provides data showing previous testing, not older than 24 months, that shows satisfactory adhesion, lack of staining, and compatibility.

E. Installation Plan: Include schedule of sealed joints, including the following:

1. Joint width indicated in Contract Documents.
2. Joint depth indicated in Contract Documents; to face of backing material at centerline of joint.
3. Method to be used to protect adjacent surfaces from sealant droppings and smears, with acknowledgment that some surfaces cannot be cleaned to like-new condition and therefore prevention is imperative.
4. Approximate date of installation, for evaluation of thermal movement influence.
5. Installation Log Form: Include the following data fields, with known information filled out.
    a. Unique identification of each length or instance of sealant installed.
    b. Location on project.
    c. Substrates.
    d. Sealant used.
    e. Stated movement capability of sealant.
    f. Primer to be used, or indicate no primer is used.
    g. Size and actual backing material used.
    h. Date of installation.
    i. Name of installer.
    j. Actual joint width; provide space to indicate maximum and minimum width.
    k. Actual joint depth to face of backing material at centerline of joint.
    l. Air temperature.

F. Preinstallation Field Adhesion Test Plan: Include destructive field adhesion testing of one sample of each combination of sealant type and substrate, except interior acrylic latex sealants, and include the following for each tested sample.
    1. Identification of testing agency.
    2. Name(s) of sealant manufacturer's field representatives who will be observing.
    3. Preinstallation Field Adhesion Test Log Form: Include the following data fields, with known information filled out.
        a. Substrate; if more than one type of substrate is involved in a single joint, provide two entries on form, for testing each sealant substrate side separately.
        b. Test date.
        c. Location on project.
        d. Sealant used.
        e. Stated movement capability of sealant.
        f. Test method used.
        g. Date of installation of field sample to be tested.
        h. Date of test.
        i. Copy of test method documents.
        j. Age of sealant upon date of testing.
        k. Test results, modeled after the sample form in the test method document.
        l. Indicate use of photographic record of test.

G. District will employ an independent testing agency to perform the field quality control inspection and testing as referenced in PART 3 of this section and as follows, to prepare and submit the field quality control plan and log, and to provide recommendations of remedies in the case of failure.
    1. Contractor shall cooperate with testing agency and repair failures discovered and destructive test location damage.

H. Field Quality Control Plan:
    1. Visual inspection of entire length of sealant joints.
    2. Nondestructive field adhesion testing of sealant joints, except interior acrylic latex sealants.
        a. For each different sealant and substrate combination, allow for one test every 12 inches in the first 10 linear feet of joint and one test every 24 inches thereafter.
        b. If any failures occur in the first 10 linear feet, continue testing at 12 inches intervals at no extra cost to District.
    3. Destructive field adhesion testing of sealant joints, except interior acrylic latex sealant.
        a. For each different sealant and substrate combination, allow for one test every 100 feet in the first 1,000 linear feet, and one test per 1,000 linear feet thereafter, or once per floor on each elevation.

b. If any failures occur in the first 1,000 linear feet, continue testing at frequency of one test per 500 linear feet at no extra cost to District.

4. Field Quality Control Log Form: Show same data fields as on Preinstallation Field Adhesion Test Log, with known information filled out and lines for multiple tests per sealant/substrate combinations; include visual inspection and specified field testing; allow for possibility that more tests than minimum specified may be necessary.

I. Field Adhesion Test Procedures:

1. Allow sealants to fully cure as recommended by manufacturer before testing.
2. Have a copy of the test method document available during tests.
3. Take photographs or make video records of each test, with joint identification provided in the photos/videos; for example, provide small erasable whiteboard positioned next to joint.
4. Record the type of failure that occurred, other information required by test method, and the information required on the Field Quality Control Log.
5. When performing destructive tests, also inspect the opened joint for proper installation characteristics recommended by manufacturer, and report any deficiencies.
6. Deliver the samples removed during destructive tests in separate sealed plastic bags, identified with project, location, test date, and test results, to District.
7. If any combination of sealant type and substrate does not show evidence of minimum adhesion or shows cohesion failure before minimum adhesion, report results to Architect.

J. Nondestructive Field Adhesion Test: Test for adhesion in accordance with ASTM C1521, using Nondestructive Spot Method.

1. Record results on Field Quality Control Log.
2. Repair failed portions of joints.

K. Destructive Field Adhesion Test: Test for adhesion in accordance with ASTM C1521, using Destructive Tail Procedure.

1. Sample: At least 18 inches long.
2. Minimum Elongation Without Adhesive Failure: Consider the tail at rest, not under any elongation stress; multiply the stated movement capability of the sealant in percent by two; then multiply 1 inch by that percentage; if adhesion failure occurs before the 1-inch mark is that distance from the substrate, the test has failed.
3. If either adhesive or cohesive failure occurs before minimum elongation, take necessary measures to correct conditions and retest; record each modification to products or installation procedures.
4. Record results on Field Quality Control Log.
5. Repair failed portions of joints.

L. Field Adhesion Tests of Joints: Test for adhesion using most appropriate method in accordance with ASTM C1521, or another applicable method as recommended by manufacturer.

1.06 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Manufacturer Warranty: Provide 2-year manufacturer warranty for installed sealants and accessories that fail to achieve a watertight seal, exhibit loss of adhesion or cohesion, or do not cure. Complete forms in District's name and register with manufacturer.

C. Extended Correction Period: Correct defective work within 2-year period commencing on Date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

2.02 JOINT SEALANT APPLICATIONS

A. Scope:

1. Exterior Joints:
    a. Do not seal exterior joints unless indicated on drawings as sealed.
    b. Seal the following joints:
        1) Wall expansion and control joints.
        2) Joints between doors, windows, and other frames or adjacent construction.
        3) Joints between different exposed materials.
2. Interior Joints:
    a. Do not seal interior joints indicated on drawings as not sealed.
    b. Do not seal gaps and openings in gypsum board, plaster, and suspended ceilings
    c. Do not seal through-penetrations in sound-rated assemblies that are also fire-rated assemblies.
    d. Seal the following joints:
        1) Joints between door frames and window frames and adjacent construction.
        2) In sound-rated wall and ceiling assemblies, gaps at electrical outlets, wiring devices, and piping penetrations.
        3) In sound-rated wall and ceiling assemblies, seal joints between wall assemblies and ceiling assemblies; between wall assemblies and other construction; between ceiling assemblies and other construction.
3. Do Not Seal:
    a. Intentional weep holes in masonry.
    b. Joints indicated to be covered with expansion joint cover assemblies.
    c. Joints where sealant is specified to be furnished and installed by manufacturer of product to be sealed.
    d. Joints where sealant installation is specified in other sections.
    e. Joints between suspended ceilings and walls.

B. Exterior Joints: Use nonsag nonstaining silicone sealant, unless otherwise indicated.
   1. Type MTL-1B - Lap Joints in Sheet Metal Fabrications: Butyl rubber, noncuring.
   2. Type MTL-1B - Lap Joints between Manufactured Metal Panels: Butyl rubber, noncuring.

C. Interior Joints: Use nonsag polyurethane sealant, unless otherwise indicated.
   1. Type AL-1 - Wall and Ceiling Joints in Nonwet Areas: Acrylic emulsion latex sealant.

D. Interior Wet Areas: restrooms; fixtures in wet areas include plumbing fixtures, countertops, cabinets, and other similar items.

2.03 JOINT SEALANTS - GENERAL

A. Sealants and Primers: Provide products with acceptable levels of volatile organic compound (VOC) content; see Section 01 61 16.

2.04 NONSAG JOINT SEALANTS

A. Nonstaining Silicone Sealant: ASTM C920, Grade NS, Uses M, A, G, and O; not expected to withstand continuous water immersion or traffic.
   1. Movement Capability: Plus and minus 50 percent, minimum.
   2. Nonstaining to Porous Stone: Nonstaining to light-colored natural stone when tested in accordance with ASTM C1248.
   3. Dirt Pick-Up: Reduced dirt pick-up compared to other silicone sealants.
   4. Color: White.

B. Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single or multi-component; not expected to withstand continuous water immersion or traffic.
   1. Movement Capability: Plus and minus 50 percent, minimum.

C. Type AL-1 - Acrylic Emulsion Latex: Water-based; ASTM C834, single component, nonstaining, nonbleeding, nonsagging; not intended for exterior use.
   1. Color: Standard colors matching finished surfaces, Type OP (opaque).
   2. Grade: ASTM C834; Grade 0 Degrees F (Minus 18 Degrees C).
   3. Products:
      a. Hilti, Inc: www.us.hilti.com/#sle.
      b. Pecora Corporation; AC-20 +Silicone: www.pecora.com/#sle.
      c. Sherwin-Williams Company: www.sherwin-williams.com/#sle.
      d. Specified Technologies Inc; Smoke N' Sound Acoustical Sealant: www.stifirestop.com/#sle.
      e. Tremco Commercial Sealants & Waterproofing; Tremflex 834: www.tremcosealants.com/#sle.
      f. Substitutions: See Section 01 60 00 - Product Requirements.

D. Type MTL-1B - Noncuring Butyl Sealant: Solvent-based, single component, nonsag, nonskinning, nonhardening, nonbleeding; nonvapor permeable; intended for fully concealed applications.

1. Products:
    a. Pecora Corporation; Pecora BA-98 Non-Skinning Butyl Sealant: www.pecora.com/#sle.
    b. Tremco Commercial Sealants & Waterproofing; Acoustical/Curtainwall Sealant: www.tremcosealants.com/#sle.
    c. Substitutions: See Section 01 60 00 - Product Requirements.

2.05 SELF-LEVELING JOINT SEALANTS

A. Type PAV-1R - Self-Leveling Silicone Sealant: ASTM C920, Grade P, Uses M and A; single or multicomponent, explicitly approved by manufacturer for traffic exposure when recessed below traffic surface; not expected to withstand continuous water immersion.
    1. Movement Capability: Plus 100 percent, minus 50 percent, minimum.
    2. Hardness Range: 0 to 15, Shore A, when tested in accordance with ASTM C661.
    3. Color: To be selected by Architect from manufacturer's standard range.
    4. Service Temperature Range: Minus 40 to 180 degrees F.
    5. Products:
        a. Dow; DOWSIL SL Parking Structure Sealant: www.dow.com/#sle.
        b. Dow; DOWSIL FC Parking Structure Sealant: www.dow.com/#sle.
        c. Pecora Corporation; Pecora 300 SL (Self-Leveling): www.pecora.com/#sle.
        d. Sika Corporation; Sikasil-728 RCS: usa.sika.com/#sle.
        e. Sika Corporation; Sikasil-728 SL: usa.sika.com/#sle.
        f. Tremco Commercial Sealants & Waterproofing; Spectrem 900SL: www.tremcosealants.com/#sle.
        g. Substitutions: See Section 01 60 00 - Product Requirements.

B. Type PAV-1A - Self-Leveling Polyurethane Sealant: ASTM C920, Grade P, Uses M and A; single or multicomponent; explicitly approved by manufacturer for traffic exposure; not expected to withstand continuous water immersion .
    1. Movement Capability: Plus and minus 25 percent, minimum.
    2. Hardness Range: 35 to 55, Shore A, when tested in accordance with ASTM C661.
    3. Color: To be selected by Architect from manufacturer's standard range.
    4. Service Temperature Range: Minus 40 to 180 degrees F.
    5. Products:
        a. Polycoat Products: www.polycoatusa.com/#sle.
        b. Sherwin-Williams Company; Stampede 1SL Polyurethane Sealant: www.sherwin-williams.com/#sle.
        c. Sherwin-Williams Company; Stampede 2SL Polyurethane Sealant: www.sherwin-williams.com/#sle.
        d. Sika Corporation; Sikaflex-1c SL: usa.sika.com/#sle.
        e. Sika Corporation; Sikaflex-2c SL: usa.sika.com/#sle.

f. Substitutions: See Section 01 60 00 - Product Requirements.

C. Type PAV-1EJ - Self-Leveling Polyurethane Sealant for Horizontal Expansion Joints: ASTM C920, Grade P, Uses T, M, and O; single or multicomponent; explicitly approved by manufacturer for horizontal expansion joints.

1. Movement Capability: Plus and minus 25 percent, minimum.
2. Hardness Range: 30 to 35, Shore A, when tested in accordance with ASTM C661.
3. Color: To be selected by Architect from manufacturer's standard range.
4. Tensile Strength: 200 to 250 psi in accordance with ASTM D412.
5. Products:
   a. Pecora Corporation; Urexpan NR-200: www.pecora.com/#sle.
   b. Sika Corporation; Sikaflex SL 2: usa.sika.com/#sle.
   c. Sika Corporation; Sikaflex-2c SL: usa.sika.com/#sle.
   d. Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com/#sle.
   e. Substitutions: See Section 01 60 00 - Product Requirements.

D. Type PAV-1CW - Self-Leveling Polyurethane Sealant for Continuous Water Immersion: Polyurethane; ASTM C920, Grade P, Uses M and A; single component; explicitly approved by manufacturer for traffic exposure and continuous water immersion.

1. Movement Capability: Plus and minus 25 percent, minimum.
2. Hardness Range: 35 to 55, Shore A, when tested in accordance with ASTM C661.
3. Color: To be selected by Architect from manufacturer's standard range.
4. Service Temperature Range: Minus 40 to 180 degrees F.
5. Products:
   a. Sika Corporation; Sikaflex SL 2: usa.sika.com/#sle.
   b. Sika Corporation; Sikaflex-2c SL: usa.sika.com/#sle.
   c. W. R. Meadows, Inc; POURTHANE SL: www.wrmeadows.com/#sle.
   d. Substitutions: See Section 01 60 00 - Product Requirements.

E. Type PAV-1STP - Self-Leveling Silyl-Terminated Polyether/Polyurethane (STPE/STPU) Sealant: ASTM C920, Grade P, Uses M and A; single component; explicitly approved by manufacturer for traffic exposure; not expected to withstand continuous water immersion.

1. Movement Capability: Plus and minus 35 percent.
2. Hardness Range: 30 to 55, Shore A, when tested in accordance with ASTM C661.
3. Color: To be selected by Architect from manufacturer's standard range.
4. Service Temperature Range: Minus 40 to 180 degrees F.
5. Products:
   a. Pecora Corporation; Urexpan NR-201: www.pecora.com/#sle.
   b. Substitutions: See Section 01 60 00 - Product Requirements.

F. Type PAV-2CW - Self-Leveling Polysulfide Sealant: ASTM C920, Grade P, Uses M and A; multicomponent; explicitly approved by manufacturer for traffic exposure and continuous water immersion.

1. Movement Capability: Plus and minus 25 percent.
2. Color: To be selected by Architect from manufacturer's standard range.
3. Products:
    a. W. R. Meadows, Inc; Deck-O-Seal (pourable): www.wrmeadows.com/#sle.
    b. Substitutions: See Section 01 60 00 - Product Requirements.

G. Type PAV-1EPX - Semi-Rigid Self-Leveling Epoxy Joint Filler: Epoxy or epoxy/polyurethane copolymer; intended for filling cracks and control joints not subject to significant movement; rigid enough to support concrete edges under traffic.

1. Composition: Multicomponent, 100 percent solids by weight.
2. Durometer Hardness: Minimum of 85 for Type A or 35 for Type D, after seven days when tested in accordance with ASTM D2240.
3. Color: To be selected by Architect from manufacturer's standard colors.
4. Joint Width, Minimum: 1/8 inch.
5. Joint Width, Maximum: 1/4 inch.
6. Joint Depth: Provide product suitable for joints from 1/8 inch to 2 inches in depth including space for backer rod.
7. Products:
    a. Adhesives Technology Corporation; CRACKBOND JF-90 HD: www.atcepoxy.com/#sle.
    b. Dayton Superior Corporation: www.daytonsuperior.com/#sle.
    c. Euclid Chemical Company; EUCO 700: www.euclidchemical.com/#sle.
    d. Mapei; Mapeiflex Joint Sealant EP 90/50: www.mapei.com/#sle.
    e. Substitutions: See Section 01 60 00 - Product Requirements.

H. Type PAV-2C - Semi-Rigid Self-Leveling Polyurea Joint Filler: Two-component, 100 percent solids; intended for filling cracks and control joints not subject to significant movement; rigid enough to support concrete edges under traffic.

1. Durometer Hardness, Type A: 75, minimum, after seven days when tested in accordance with ASTM D2240.
2. Color: To be selected by Architect from manufacturer's standard colors.
3. Joint Width, Minimum: 1/8 inch.
4. Joint Width, Maximum: 1/2 inch.
5. Joint Depth: Provide product suitable for joints from 1/8 inch to 1 inch in depth excluding space for backer rod.
6. Products:
    a. Adhesives Technology Corporation; CRACKBOND JF-82 FAST: www.atcepoxy.com/#sle.

b. ARDEX Engineered Cements; ARDEX ARDISEAL RAPID PLUS: www.ardexamericas.com/#sle.

c. Euclid Chemical Company; EUCO QWIKjoint UVR: www.euclidchemical.com/#sle.

d. Mapei; Mapeiflex Joint Sealant PO 95/100: www.mapei.com/#sle.

e. Polycoat Products; Poly-Caulk 82: www.polycoatusa.com/#sle.

f. Substitutions: See Section 01 60 00 - Product Requirements.

2.06 ACCESSORIES

A. Sealant Backing Materials, General: Materials placed in joint before applying sealants; assists sealant performance and service life by developing optimum sealant profile and preventing three-sided adhesion; type and size recommended by sealant manufacturer for compatibility with sealant, substrate, and application.

B. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.

C. Masking Tape: Self-adhesive, nonabsorbent, nonstaining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.

D. Joint Cleaner: Noncorrosive and nonstaining type, type recommended by sealant manufacturer; compatible with joint forming materials.

E. Primers: Type recommended by sealant manufacturer to suit application; nonstaining.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that joints are ready to receive work.

B. Verify that backing materials are compatible with sealants.

C. Verify that backer rods are of the correct size.

D. Preinstallation Adhesion Testing: Install a sample for each test location indicated in the test plan.

1. Test each sample as specified in PART 1 under QUALITY ASSURANCE article.
2. Notify Architect of date and time that tests will be performed, at least seven days in advance.
3. Arrange for sealant manufacturer's technical representative to be present during tests.
4. Record each test on Preinstallation Adhesion Test Log as indicated.
5. If any sample fails, review products and installation procedures, consult manufacturer, or take other measures that are necessary to ensure adhesion; retest in a different location; if unable to obtain satisfactory adhesion, report to Architect.
6. After completion of tests, remove remaining sample material and prepare joints for new sealant installation.

3.02 PREPARATION

A. Remove loose materials and foreign matter that could impair adhesion of sealant.

B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.

C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.

D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

E. Concrete Floor Joints That Will Be Exposed in Completed Work: Test joint filler in an inconspicuous area to verify that it does not stain or discolor slab.

3.03 INSTALLATION

A. Install this work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Provide joint sealant installations complying with ASTM C1193.

C. Install acoustical sealant application work in accordance with ASTM C919.

D. Measure joint dimensions and size joint backers to achieve the following, unless otherwise indicated:

1. Width/depth ratio of 2:1.
2. Neck dimension no greater than 1/3 of the joint width.
3. Surface bond area on each side not less than 75 percent of joint width.

E. Install bond breaker backing tape where backer rod cannot be used.

F. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.

G. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.

H. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

I. Concrete Floor Joint Filler: After full cure, shave joint filler flush with top of concrete slab.

3.04 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements for additional requirements.

B. District will employ an independent testing agency to perform field quality control inspection and testing as specified in PART 1 under QUALITY ASSURANCE article.

C. Non-Destructive Adhesion Testing: If there are any failures in first 100 linear feet, notify Architect immediately.

D. Destructive Adhesion Testing: If there are any failures in first 1,000 linear feet, notify Architect immediately.

E. Remove and replace failed portions of sealants using same materials and procedures as indicated for original installation.

F. Repair destructive test location damage immediately after evaluation and recording of results.

3.05 POST-OCCUPANCY

A. Post-Occupancy Inspection: Perform visual inspection of entire length of project sealant joints at a time that joints have opened to their greatest width, i.e., at low temperature in thermal cycle. Report failures immediately and repair them.

END OF SECTION

SECTION 08 06 71
DOOR HARDWARE SCHEDULE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preliminary schedule of door hardware sets for swinging as indicated on drawings.

1.02 RELATED REQUIREMENTS

A. Section 08 71 00 - Door Hardware: Requirements to comply with in coordination with this section.

1.03 REFERENCE STANDARDS

A. BHMA (CPD) - Certified Products Directory.

B. BHMA A156.3 - Exit Devices.

C. BHMA A156.5 - Cylinders and Input Devices for Locks.

D. BHMA A156.13 - Mortise Locks and Latches.

E. BHMA A156.18 - Standard for Materials and Finishes.

F. DHI (H&S) - Sequence and Format for the Hardware Schedule.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Comply with submittal requirements as indicated in Section 08 71 00.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Only manufacturers listed in Door Hardware Schedule or Section 08 71 00 are considered acceptable, unless noted otherwise.

B. Obtain each type of door hardware as indicated from a single manufacturer and single supplier.

C. Products are listed and certified compliant with specified standards by BHMA (CPD).

D. Manufacturer's Abbreviations: Coordinate with manufacturers listed in Section 08 71 00.

1. GLY - Glynn Johnson, Allegion, PLC.
2. IVE - Ives, Allegion, PLC.
3. KNX/KNO - Knox Company.
4. LCN - LCN Commercial Division, Allegion, PLC.
5. SCE - Schlage Electronic Security, Allegion, PLC
6. SCH/SC - Schlage Lock Company, Allegion, PLC.

7. VON - Von Duprin, Allegion, PLC..
8. ZER - Zero Industries, Inc., Allegion, PLC.
9. TBD - To be determined.
10. B/O, BYO, OT - By Other trades.

2.02 DESCRIPTION

A. Door hardware sets provided represent the design intent, they are only a guideline and should not be considered a detailed or complete hardware schedule.
   1. Provide door hardware item(s) as required for similar purposes, even when item is not listed for a door in Door Hardware Schedule.
   2. Necessary items that are not included in a Hardware Set should be added and have the appropriate additional hardware as required for proper application and functionality.
   3. Door hardware supplier is responsible for providing proper size and hand of door for products required in accordance with Door Hardware Schedule and as indicated on drawings.
   4. Quantities listed are for each Pair (PR) of doors, or for each Single (SGL) door, as indicated in hardware sets.

2.03 LOCK FUNCTION CODES

A. Function Codes for Cylindrical Locks: Complying with BHMA A156.5.
B. Function Codes for Mortise Locks: Complying with BHMA A156.13.
C. Function Codes for Exit Devices: Complying with BHMA A156.3.

2.04 FINISHES

A. Finishes: Complying with BHMA A156.18.

PART 3 EXECUTION

3.01 DOOR HARDWARE SCHEDULE

A. Organize listing of door hardware components within each hardware set in compliance with 10-Part scheduling sequence indicated in DHI (H&S), unless otherwise indicated.
B. See door schedule in drawings for hardware set assignments.
C. Do not order hardware until Finished Hardware has been reviewed and approved by Architect's hardware consultant.
D. Provide Factory order numbers for all products supplied on this project as part of close out documents for District's warranty records.
E. Any door count quantity shown in the HW set listings is for reference only. Verify all door quantities with the Architectural Drawings.
F. Hardware Sets:

HARDWARE GROUP NO. 01
For use on Door #(s):
A11
Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PUSH PLATE	1001-11	613	TRM
1	EA	PULL PLATE	1010-3	630	TRM
1	EA	SURFACE CLOSER	4040XP RW/PA TBWMS	689	LCN
1	EA	MOP PLATE 4" x 1" LDW	K0038	630	TRM
1	EA	KICK PLATE	K0050 10" X 2" LDW B4E	630	TRM
1	EA	WALL STOP	1270CX	630	TRM
3	EA	SILENCER	1229	GRY	TRM

HARDWARE GROUP NO. 02
For use on Door #(s):
A12
Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PRIVACY LOCK W/ OUTSIDE INDICATOR W/ INSIDE INDICATOR	L9040 03N 09-544 OS-OCC IS-LOC	626	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA TBWMS	689	LCN
1	EA	MOP PLATE 4" x 1" LDW	K0038	630	TRM
1	EA	KICK PLATE	K0050 10" X 2" LDW B4E	630	TRM
1	EA	WALL STOP	1270CX	630	TRM
3	EA	SILENCER	1229	GRY	TRM

HARDWARE GROUP NO. 03 (FOR REFERENCE ONLY)
Existing on Door #(s):
A9
Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PRIVACY LOCK W/ ADA THUMBTURN	L9050 03A L583-363	626	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA TBWMS	689	LCN
1	EA	WALL STOP	1270CX	630	TRM
3	EA	SILENCER	1229	GRY	TRM

HARDWARE GROUP NO. 04 (FOR REFERENCE ONLY)
Existing on Door #(s):
A10
Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PUSH PLATE	1001-11	613	TRM
1	EA	PULL PLATE	1010-3	630	TRM
1	EA	SURFACE CLOSER	4040XP RW/PA TBWMS	689	LCN
1	EA	MOP PLATE 4" x 1" LDW	K0038	630	TRM
1	EA	KICK PLATE	K0050 10" X 2" LDW B4E	630	TRM
1	EA	WALL STOP	1270CX	630	TRM
3	EA	SILENCER	1229	GRY	TRM

END OF SECTION

SECTION 08 11 13
HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Non-fire-rated hollow metal doors and frames.

B. Fire-rated hollow metal doors and frames.

C. Thermally insulated hollow metal doors with frames.

1.02 RELATED REQUIREMENTS

A. Section 08 71 00 - Door Hardware.

B. Section 09 91 23 - Interior Painting: Field painting.

1.03 ABBREVIATIONS AND ACRONYMS

A. ANSI: American National Standards Institute.

B. HMMA: Hollow Metal Manufacturers Association.

C. NAAMM: National Association of Architectural Metal Manufacturers.

D. NFPA: National Fire Protection Association.

E. SDI: Steel Door Institute.

F. UL: Underwriters Laboratories.

1.04 REFERENCE STANDARDS

A. 12-7-4 CA Ref Stds - California Referenced Standards Code Chapter 12-7-4 Fire Resistive Standards.

B. ADA Standards - 2010 ADA Standards for Accessible Design.

C. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors.

D. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames.

E. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100).

F. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.

G. ANSI/SDI A250.11 - Recommended Erection Instructions for Steel Frames.

H. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

I. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

J. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable.

K. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.

L. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

M. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.

N. BHMA A156.115 - Hardware Preparation in Steel Doors and Frames.

O. CBC - California Building Code.

P. ITS (DIR) - Directory of Listed Products.

Q. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames.

R. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames.

S. NAAMM HMMA 840 - Guide Specifications for Receipt, Storage and Installation of Hollow Metal Doors and Frames.

T. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames.

U. NFPA 80 - Standard for Fire Doors and Other Opening Protectives.

V. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives.

W. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies.

X. SDI 117 - Manufacturing Tolerances for Standard Steel Doors and Frames.

Y. UL (DIR) - Online Certifications Directory.

Z. UL 10B - Standard for Fire Tests of Door Assemblies.

AA. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced standards/guidelines.

C. Shop Drawings: Details of each opening, showing elevations, frame profiles, and any indicated finish requirements.

1. Show fabrication and installation of steel doors and frames. Include details of each frame type, elevations of door design types, conditions at openings, details of construction, location and installation requirements of door and frame hardware and reinforcements, and details of joints and connections. Show anchorage and accessory items.

2. Provide schedule of doors and frames using same reference numbers for details and openings as those indicated on Drawings.

D. Samples: Submit two samples of metal, 2 by 2 inches in size, showing factory finishes, colors, and surface texture.

E. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.

F. Manufacturer's Certificate: Certification that products meet or exceed specified requirements.

G. Manufacturer's Qualification Statement.

H. Installer's Qualification Statement.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

C. Maintain at project site copies of reference standards relating to installation of products specified.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Provide packaging such as cardboard, or other containers to protect surfaces of hollow metal doors. Strap welded frames together in pairs with head of one unit inverted or provide temporary spreaders fastened to the bottom of each frame.

B. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.

1. Store doors and frames on platforms under cover.
2. Store doors and frames in dry storage spaces, with adequate ventilation, free from dust, and which permits easy access for inspection and handling.
3. Avoid using nonvented plastic or canvas shelters that create a humidity chamber.
4. If the wrapper on the door becomes wet, remove the wrapper.

C. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

A. Fire-Rated Door Assemblies: Meet the requirements of the California Building Code (CBC), Title 24, Part 2, Chapter 7 - Fire Resistance Rated Construction for the fire resistive ratings indicated, and which are labeled by Underwriter's Laboratories, Factory Mutual, or other testing agency acceptable to the State Fire Marshal.

1. Fire-rated door and frame construction: Conform to NFPA 252, applicable CBC Standard 12-7-4 CA Ref Stds and requirements of Factory Mutual System (FM). Labels on fire-rated doors and frames shall identify FM listing approval. Comply with UL 10B.

2. Fire-rated door and frame installation: NFPA 80 - Fire Door Installation and applicable CBC Standards for fire rated class indicated.
3. Fire-rated doors, intumescent seals: UL 10C compliant. If intumescent seals are required for the fire labeled assembly, furnish flush with door edge type seals or kerfed in frame type seals. Surface applied adhesive seals will not be accepted. Coordinate frame fabrication to allow use of kerfed in frame type seal options.
4. Temperature rise rating: At exit stairwell enclosures, exit passageways, and horizontal exits, provide doors which are labeled for a maximum transmitted temperature end point not to exceed 450 degrees above ambient at the end of 30 minutes of fire exposure.
5. Oversize fire-rated door assemblies: For units exceeding sizes of tested assemblies, provide certification by a testing agency acceptable to the State Fire Marshal that doors comply with standard construction requirements for tested and labeled fire-rated door assemblies except for size.
6. Where fire resistive doors are indicated to be equipped with louvers, provide fusible link type louvers acceptable to the testing agency labeling the fire door and frame assembly.
    a. Exception: Louvers are not to be used in "S" rated door assemblies. CBC Section 710.5.2.1 and 716.2.2.1.1.
7. All exit/access doorways and other doors opening into a fire rated corridor shall be protected by tight-fitting smoke and draft control assemblies having a fire rating of not less than 20 minutes when tested in accordance with CBC Standards and shall be labeled accordingly per CBC section 716.2.9.

2.02 MANUFACTURERS

A. Basis of Design Product: Hollow Metal Doors as manufactured by DCI Hollow Metal, or equal.

B. Hollow Metal Doors and Frames:
1. DCI Hollow Metal: www.dcihollowmetal.com.
2. Ceco Door, an Assa Abloy Group company: www.assaabloydss.com.
3. Curries, an Assa Abloy Group company: www.assaabloydss.com.
4. Republic Doors, an Allegion brand: www.republicdoor.com/#sle.
5. Steelcraft, an Allegion brand: www.allegion.com/sle.
6. Technical Glass Products: www.tgpamerica.com/#sle.
7. Or Equal Substitutions: See Section 01 60 00 - Product Requirements.

2.03 PERFORMANCE REQUIREMENTS

A. Requirements for Hollow Metal Doors and Frames:
1. Steel Sheet: Comply with one or more of the following requirements; galvannealed steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.
2. Accessibility: Comply with ADA Standards and CBC Chapter 11B.

3. Exterior Door Top Closures: Flush end closure channel, with top and door faces aligned.
4. Door Edge Profile: Beveled, both sides.
5. Typical Door Face Sheets: Flush. Smooth .
6. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
7. Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvannealed) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.
    a. Based on SDI Standards: Provide at least A40/ZF120 (galvannealed) when necessary, coating not required for typical interior door applications, and at least A60/ZF180 (galvannealed) for corrosive locations.

B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.04 HOLLOW METAL DOORS

A. Door Finish: Factory primed and field finished.

B. Exterior Doors: Thermally insulated.
1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
    a. Level 3 - Extra Heavy-duty.
    b. Physical Performance Level A, 1,000,000 cycles; in accordance with ANSI/SDI A250.4.
    c. Model 2 - Seamless.
    d. Door Face Metal Thickness: 16 gauge, 0.053 inch, minimum.
    e. Zinc Coating: A60/ZF180 galvannealed coating; ASTM A653/A653M.
2. Core Material: Vertical steel stiffeners with fiberglass batts.
    a. Foam Plastic Insulation: Manufacturer's standard board insulation with maximum flame spread index (FSI) of 75, and maximum smoke developed index (SDI) of 450 in accordance with ASTM E84, and completely enclosed within interior of door.
3. Door Thermal Resistance: R-Value of 9.9, minimum, for installed thickness of polyisocyanurate.
    a. Doors with no glazing or less than 50 percent glazed shall comply with the required U-factor not greater than the applicable value (0.70) in Subchapter Table 140.3-B, C, or D. California Energy Code Section 140.3 (a) 7.
4. Door Thickness: 1-3/4 inches, nominal.
5. Weatherstripping: Refer to Section 08 71 00.

a. Maximum Air Leakage, ASTM E283: 0.30cfm per square foot of static differential air pressure of 1.567 psf (equivalent to 25 mph wind velocity). California Energy Code Section 110.6(a) 1.

6. Door Finish: Factory primed and field finished.
   a. Provide compatible primer for Section 09 96 00 - High-Performance Coatings.

C. Interior Doors, Non-Fire-Rated:
   1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
      a. Level 2 - Heavy-duty.
      b. Physical Performance Level B 500 000 cycles; in accordance with ANSI/SDI A250.4.
      c. Model 2 - Seamless.
      d. Door Face Metal Thickness: 20 gage, 0.032 inch, minimum.
      e. Zinc Coating: A60/ZF180 galvannealed coating; ASTM A653/A653M.
   2. Door Core Material: Manufacturers standard core material/construction and in compliance with requirements.
   3. Door Thickness: 1-3/4 inches, nominal.

D. Fire-Rated Doors:
   1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
      a. Level 2 - Heavy-duty.
      b. Physical Performance Level B 500 000 cycles; in accordance with ANSI/SDI A250.4.
      c. Model 2 - Seamless.
      d. Door Face Metal Thickness: 18 gage, 0.042 inch, minimum.
   2. Fire Rating: As indicated on Door Schedule, tested in accordance with UL 10C and NFPA 252 ("positive pressure fire tests").
      a. Provide units listed and labeled by UL (DIR) or ITS (DIR).
      b. Permanently attach fire rating label to each fire rated unit. CBC 716.2.9.
   3. Door Core Material: Manufacturers standard core material/construction in compliance with requirements.
      a. Fabricate to the requirements of NFPA 252 for the hourly rates indicated.
   4. Door Thickness: 1-3/4 inches, nominal.

2.05 HOLLOW METAL FRAMES

A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.

B. Frame Finish: Factory primed and field finished.

C. Exterior Door Frames: Fully welded.
   1. Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with A40/ZF120 coating.
   2. Frame Metal Thickness: 16 gage, 0.053 inch, minimum.

3. Weatherstripping: Separate, see Section 08 71 00.

D. Interior Door Frames, Non-Fire Rated: Full profile/continuously welded type.

1. Frame Metal Thickness: 18 gage, 0.042 inch, minimum.

E. Door Frames, Fire-Rated: Full profile/continuously welded type.

1. Fire Rating: Same as door, labeled.
2. Frame Metal Thickness: 16 gage, 0.053 inch, minimum.

F. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.

G. Frames in Masonry Walls: Size to suit masonry coursing with head member 4 inches high to fill opening without cutting masonry units.

H. Frames Wider than 48 inches: Reinforce with steel channel fitted tightly into frame head, flush with top.

2.06 FINISHES

A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

1. Exterior Steel Doors and Door Frames: Comply with requirements for primer for finish coats.
2. Interior Steel Doors and Rolled Steel Door Frames: Rust-inhibitive enamel or paint, either air-drying or baking, suitable as a base for specified finish paints.

B. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15 mil, 0.015 inch dry film thickness (DFT) per coat; provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

1. Fire-Rated Frames: Comply with fire rating requirements indicated.

C. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.07 ACCESSORIES

A. Supports and Anchors: Fabricate of not less than 16 gage sheet steel; galvanized where used with galvanized frames or at exterior, damp or wet locations.

1. Anchors: Provide in accordance with ANSI/SDI A250.11.
    a. Anchors at fire rated frames shall also conform to UL 10B.
    b. Provide one floor anchor and the number of wall anchors listed below welded into each jamb member.
        1) Number of anchors at:
    c. Wall anchors shall be of type indicated for the specific wall condition and of same material specified for frames.
    d. Provide head anchors welded into head member as recommended by the frame manufacturer.
    e. Anchors: 16 gage minimum for galvanized frames and 16 gage minimum for cold or hot rolled steel frames.

f. Provide “Z” spacer type anchors for all wood studs.

2. Punch and dimple jambs within 6 inches of bottom for attachment to concrete stem walls where occur.

B. Silencers: Resilient rubber, fitted into drilled hole; provide three on strike side of single door, three on center mullion of pairs, and two on head of pairs without center mullions.

1. Omit silencers where head and jamb bulb-type weatherstripping or sound seals are to be installed and omit where in violation of fire rating. Silencers are specified in Section 08 71 00 - Door Hardware.

C. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

D. Inserts, Bolts, and Fasteners: Manufacturer's standard units. Where items are to be built into exterior walls, hot-dip galvanize in compliance with ASTM A153/A153M, Class C or D as applicable.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Verify that finished walls are in plane to ensure proper door alignment.

3.02 PREPARATION

A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

3.03 INSTALLATION

A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.

B. In addition, install fire rated units in accordance with NFPA 80 and their listing.

1. Provide clearances as specified in NFPA 80, NFPA 105, and as required by California Building Code (CBC).

C. Coordinate frame anchor placement with wall construction.

D. Install door hardware as specified in Section 08 71 00.

1. Comply with recommended practice for hardware placement of doors and frames in accordance with ANSI/SDI A250.6 or NAAMM HMMA 861.

E. Coordinate installation of electrical connections to electrical hardware items.

F. Welded Steel Frames Installation:

1. Install frame solid in the wall, plumb and square, with proper opening width and height.

a. Dry-pack void when frame set in place.

2. Fasten clip angles to floor construction and brace frames so as to retain their position and clearance during construction of adjacent Work. Attach structural overhead bracing securely to structure above, as required.

3. Install anchors for connection to concrete/masonry at each jamb (minimum 3 per jamb).
4. Install anchors for stud partitions on hinge jamb immediately above each hinge reinforcing plate and below the top hinge reinforcement (minimum 4 per jamb) and locate anchors directly opposite on the strike jamb.
5. Comply with requirements for fire-rated assembly, including filling frame with solid portland cement grout or firestopping material, as detailed.

G. Doors Installation, General: Hang doors and adjust for proper clearances and operation. Refer to Section 08 71 00 - Door Hardware for hardware requirements.

3.04 REPAIRS

A. Make repairs only if permitted by Architect. Otherwise, replace damaged components.

B. Fill surface depressions with metallic paste filler, allow to thoroughly cure, sand flush, and smooth for an invisible appearance with adjacent metal surfaces.

C. Sand smooth all rusted areas.

D. Repair galvanized surfaces with specified repair compound.

E. Apply touch-up paint using air drying primer compatible with shop-applied finish.

3.05 TOLERANCES

A. Flush Steel Door Installation Tolerances: Fit hollow metal doors accurately in frames, within clearances specified in ANSI/SDI A250.8.

B. Clearances Between Door and Frame: Comply with related requirements of specified frame standards or custom guidelines indicated in accordance with SDI 117 or NAAMM HMMA 861.

C. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

3.06 ADJUSTING

A. Adjust for smooth and balanced door movement.

3.07 CLEANING AND PROTECTION

A. Prime Coat Touch-up: Immediately after installation, sand smooth all corroded (rusted), damaged and deteriorated areas of prime coat and apply touch-up coat of compatible air-drying primer.

B. Protection: Protect installed frames and doors from damage.
1. Provide protective coverings and other devices as necessary, in conformance to requirements specified in Section 01 50 00 - Temporary Facilities and Controls.
2. Remove protective devices from prefinished components for Substantial Completion review.

C. Final Adjustments: Check and readjust operating hardware items, leaving steel doors and frames undamaged and in complete and proper operating condition.

D. Cleaning: Clean doors and frames of surface contaminants detrimental to proper application of field-applied finishes.

3.08 SCHEDULE - SEE DRAWINGS

A. Refer to Door and Frame Schedule on the drawings.

END OF SECTION

SECTION 08 31 00
ACCESS DOORS AND PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wall- and ceiling-mounted access units.

1.02 RELATED REQUIREMENTS

A. Section 09 91 23 - Interior Painting: Field paint finish.

1.03 REFERENCE STANDARDS

A. CBC - California Building Code.

B. DSA IR 25-3 - Suspended Gypsum Board Ceiling.

C. ITS (DIR) - Directory of Listed Products.

D. UL (FRD) - Fire Resistance Directory.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide sizes, types, finishes, hardware, scheduled locations, and details of adjoining work.

C. Shop Drawings: Indicate exact position of each access door and/or panel unit.

D. Manufacturer's Installation Instructions: Indicate installation requirements.

E. Installer's qualification statement.

F. Project Record Documents: Record actual locations of each access unit.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years documented experience.

C. Single-Source Responsibility: Obtain access doors for entire project from one source from a single manufacturer.

D. Size Variations: Obtain Architect's acceptance of manufacturer's standard size units, which may vary slightly from sizes indicated.

E. Coordination: Furnish inserts and anchoring devices for building into adjoining Work for installation of access doors.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

A. Fire rated access doors shall conform to California Building Code (CBC) Title 24, Part 2, Chapter 7. Panels shall bear the label of Underwriters Laboratories or other testing agency acceptable to the State Fire Marshal.

B. Fire-Resistance Ratings: Wherever a fire-resistance classification is indicated, provide access door assembly for rating shown, with flush door, frame, hinge, and latch from manufacturer listed in UL (FRD). Provide UL label on each fire-rated access door.

2.02 ACCESS DOORS AND PANELS ASSEMBLIES

A. Access Door Materials and Fabrication, General: Provide each access door assembly manufactured as an integral unit, complete with all parts, and ready for installation.

1. If size is not indicated, provide size as directed to adequately access concealed operable mechanisms.

B. Units in Fire Rated Assemblies: Fire rating equivalent to the fire rated assembly in which they are to be installed.

1. Provide products listed and labeled by UL or ITS (Warnock Hersey) as suitable for the purpose specified and indicated.

C. Wall-Mounted Units:

1. Location: As indicated on drawings.
2. Panel Material: Steel.
3. Size: 12 by 12 inches, nominal minimum..
4. Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.
5. Wall Mounting Criteria: Provide surface-mounted face frame and door surface flush with frame surface.

D. Wall-Mounted Units in Wet Areas:

1. Location: As indicated on drawings.
2. Panel Material: Stainless steel, Type 304.
3. Size: 12 by 12 inches, nominal minimum..
4. Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.
5. Wall Mounting Criteria: Provide surface-mounted face frame and door surface flush with frame surface.

E. Fire-Rated Wall-Mounted Units:

1. Location: As indicated on drawings.
2. Wall Fire-Rating: As indicated on drawings.
3. Panel Material: Steel.
4. Size: 12 by 12 inches, nominal minimum.

5. Door/Panel: Insulated double-surface panel, with tool-operated spring or cam lock and no handle.

F. Ceiling-Mounted Units:

1. Location: As indicated on drawings.
2. Panel Material: Steel.
3. Size - Lay-In Grid Ceilings: To match module of ceiling grid.
4. Size - Framed Ceiling Attic Access Panel: 20 by 30 inches. CBC Section 1209.2.
5. Size - Other Ceilings: 12 by 12 inches. Unless otherwise noted on Drawings.
    a. Maximum 325 square inches per DSA IR 25-3 in suspended gypsum board ceilings, for utility access only.
        1) Provide a permanently attached warning label stating:
            (a) "Warning: Do not climb, walk, or crawl on the gypsum board ceiling panels or metal framing. Do not store or stow anything on the gypsum board or metal framing."
6. Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.
    a. Open with allen wrench - no keys.
    b. Include a retention spring or bar to keep door from falling open rapidly.

2.03 WALL- AND CEILING-MOUNTED ACCESS UNITS

A. Manufacturers:

1. Activar Construction Products Group, Inc. - JL Industries: www.activarcpg.com/#sle.
2. ACUDOR Products Inc: www.acudor.com/#sle.
3. Babcock-Davis: www.babcockdavis.com/#sle.
4. Cendrex, Inc: www.cendrex.com/#sle.
5. Karp Associates, Inc: www.karpinc.com/#sle.
6. Larsen's Manufacturing Co.: www.larsensmfg.com.
7. Nystrom, Inc: www.nystrom.com/#sle.
8. Substitutions: See Section 01 60 00 - Product Requirements.

B. Wall- and Ceiling-Mounted Units: Factory-fabricated door and frame, fully assembled units with corner joints welded, filled and ground flush; square and without rack or warp; coordinate requirements with type of installation assembly being used for each unit.

1. Style: Exposed frame with door surface flush with frame surface.
    a. Gypsum Board Mounting Criteria: Use drywall bead type frame.
    b. Plaster Mounting Criteria: Use plaster bead type frame.
2. Door Style: Single thickness with rolled or turned in edges.
3. Frames: 16-gauge, 0.0598-inch minimum thickness.
4. Heavy-Duty Frames: 14-gauge, 0.0747-inch minimum thickness.

5. Single Steel Sheet Door Panels: 16-gauge, 0,0625-inch minimum thickness.
6. Door Panels to Receive Wall/Ceiling Finish: Surface recessed 5/8 inch back from wall face.
    a. For recess-mounted access doors, provide access sleeves for each locking device.
    b. Provide plastic grommets for installation in holes cut through finish.
    c. Provide recess-mounted doors for concealed installation in:
        1) Acoustic tile ceiling systems, where indicated.
        2) Acoustical tile-finished gypsum board ceilings, where indicated.
        3) Gypsum board walls, where indicated.
        4) Ceramic tile walls, where indicated.
7. Insulation: Non-combustible mineral wool or glass fiber.
8. Units in Fire-Rated Assemblies: Fire rating as required by applicable code for fire-rated assembly that access doors are being installed.
    a. Provide products listed by ITS (DIR) or UL (FRD) as suitable for purpose indicated.
    b. Provide certificate of compliance from authorities having jurisdiction indicating approval of fire rated doors.
9. Primed and Factory Finish: Polyester powder coat; color as selected by Architect from manufacturer's standard colors.
10. Door/Panel Size: As indicated on the drawings.
11. Hardware:
    a. Hardware for Fire-Rated Units: As required for listing.
    b. Hinges for Non-Fire-Rated Units: Concealed, constant force closure spring type.
    c. Latch/Lock: Screw driver slot for quarter turn cam latch.
    d. Gasketing: Extruded neoprene, around perimeter of door panel.

C. Provide recess-mounted doors and frames with expanded metal lath for concealed installation in plaster.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that rough openings are correctly sized and located.

B. Begin installation only after substrates have been properly prepared, and if the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to proceeding with this work.

B. Prepare surfaces using methods recommended by manufacturer for applicable substrates in accordance with project conditions.

3.03 INSTALLATION

A. Install units in accordance with manufacturer's instructions.

B. Install frames plumb and level in openings, and secure units rigidly in place.

C. Provide for correct termination of adjoining finish materials.

D. Position units to provide convenient access to concealed equipment when necessary.

3.04 ADJUST AND CLEAN

A. Adjust access doors and hardware after installation for proper and smooth operation.

B. Remove and replace panels or frames that are warped, bowed, or otherwise damaged.

C. Remove protective coverings and clean stainless steel access doors during cleaning for Substantial Completion Review.

3.05 SCHEDULES

A. Access Door Locations:

1. Provide access doors where indicated on Architectural, Mechanical, Plumbing and Electrical Drawings.
2. Access doors indicated and required for Mechanical, Plumbing and Electrical Work shall be of a type matching those specified in this Section.
3. Provide access doors as required to service building systems and as required by governing authorities, although not shown on Drawings.
    a. Provide at smoke or fire detector in attic spaces. Size to allow for access and testing.
4. Locate access doors, where practical, in building service areas and not in public or guest view.
5. Submit proposed locations for access doors, not indicated on Drawings, to Architect for review prior to rough-in.

B. Non-Fire Rated Door and Frame Units in Walls:

1. In Gypsum Board on Studs:
    a. For service and utility locations, primer paint finish, Model DSC-214M manufactured by Karp.
    b. For food service, toilet and damp locations, stainless steel, Model DSC-214M manufactured by Karp.
    c. For Administration, Multi-Purpose and similar areas accessible by general public, recessed face for field-applied and finished plaster on door face, Model RDW manufactured by Karp.
    d. For toilets and locations accessible by general public with ceramic tile wall finish, flush-mounted with face of tile, stainless steel, Model DSB-214M manufactured by Karp.

C. Non-Fire Rated Door and Frame Units in Ceilings:

1. In Gypsum Board on Metal Furring:

a. For service and utility locations, primer paint finish, Model DSC-214M manufactured by Karp.

b. For food service, toilet and damp locations, stainless steel, Model DSC-214M manufactured by Karp.

c. For Administration, Multi-Purpose and similar areas accessible by general public, recessed face for field-applied and finished plaster on door face, Model RDW manufactured by Karp.

D. Fire-Rated Access Doors: Access doors in time-rated fire-resistive walls, partitions and ceilings shall carry same rating as the wall, partition or ceiling.

E. Fire Rated Door and Frame Units in Walls:

1. In Gypsum Board on Studs:

a. 1-1/2 hour B label fire rating.

b. For public areas, service and utility locations, primer paint finish, surface mounted, filled with 2-inch thick fire-rated insulation, with automatic closer, self-latching bolt-type latch, Model KPR-150FR manufactured by Karp.

c. For Food Service, Toilet and other damp locations with ceramic tile finish, stainless steel finish, surface mounted, filled with 2-inch thick fire-rated insulation, with automatic closer, self-latching bolt-type latch, Model KPR-150FR manufactured by Karp.

F. Fire Rated Door and Frame Units in Ceilings:

1. In Gypsum Board on Metal Furring:

a. For typical dry locations, surface mounted, primer paint finish, filled with 2-inch thick fire-rated insulation, with automatic closer, self-latching bolt-type latch, Model KRP-150FR manufactured by Karp.

b. For Food Service, Toilet and other damp locations, stainless steel finish, surface mounted, filled with 2-inch thick fire-rated insulation, with automatic closer, self-latching bolt-type latch, Model KPR-150FR manufactured by Karp.

END OF SECTION

SECTION 08 71 00
DOOR HARDWARE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Hardware for hollow metal doors.

B. Hardware for fire-rated doors.

C. Lock cylinders for doors that hardware is specified in other sections.

D. Thresholds.

E. Weatherstripping and gasketing.

1.02 RELATED REQUIREMENTS

A. Section 07 92 00 - Joint Sealants: Sealants for setting exterior door thresholds.

B. Section 08 06 71 - Door Hardware Schedule: Schedule of door hardware sets.

C. Section 08 11 13 - Hollow Metal Doors and Frames.

D. Section 10 14 23 - Panel Signage: Additional signage requirements.

1.03 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design.

B. BHMA (CPD) - Certified Products Directory.

C. BHMA A156.1 - Standard for Butts and Hinges.

D. BHMA A156.3 - Exit Devices.

E. BHMA A156.4 - Door Closers and Pivots.

F. BHMA A156.5 - Cylinders and Input Devices for Locks.

G. BHMA A156.6 - Standard for Architectural Door Trim.

H. BHMA A156.7 - Template Hinge Dimensions.

I. BHMA A156.8 - Door Controls - Overhead Stops and Holders.

J. BHMA A156.13 - Mortise Locks and Latches.

K. BHMA A156.16 - Standard for Auxiliary Hardware.

L. BHMA A156.17 - Self Closing Hinges & Pivots.

M. BHMA A156.20 - Standard for Strap and Tee Hinges, and Hasps.

N. BHMA A156.21 - Thresholds.

O. BHMA A156.22 - Standard for Gasketing.

P. BHMA A156.26 - Standard for Continuous Hinges.

Q. BHMA A156.28 - Standard for Recommended Practices for Mechanical Keying Systems.

R. BHMA A156.115 - Hardware Preparation in Steel Doors and Frames.

S. CBC - California Building Code.

T. CBC Ch. 11B - California Building Code-Chapter 11B.

U. DHI (H&S) - Sequence and Format for the Hardware Schedule.

V. DHI (KSN) - Keying Systems and Nomenclature.

W. DSA BU 11-05 - Impact of AB 211 - Concerning Door Hardware.

X. DSA BU 19-05 - AB 3205 Door Hardware Requirements.

Y. DSA BU 24-04 - EDC 17586 (AB 2565, 2024) Interior Door Locking Requirements for K-12 Schools.

Z. ITS (DIR) - Directory of Listed Products.

AA. NFPA 80 - Standard for Fire Doors and Other Opening Protectives.

BB. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives.

CC. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies.

DD. UL (DIR) - Online Certifications Directory.

EE. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies.

FF. UL 305 - Standard for Panic Hardware.

GG. UL 1784 - Standard for Air Leakage Tests of Door Assemblies and Other Opening Protectives.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the manufacture, fabrication, and installation of products that door hardware is installed on.

B. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

C. Preinstallation Meeting: Convene a preinstallation meeting one week prior to commencing work of this section; attendance is required by affected installers and the following:

1. Architect.
2. Installer's Architectural Hardware Consultant (AHC).
3. Hardware Installer.
4. Owner's Security Consultant.

D. Furnish templates for door and frame preparation to manufacturers and fabricators of products requiring internal reinforcement for door hardware.

E. Keying Requirements Meeting:

1. Schedule meeting at project site prior to Contractor occupancy.
2. Attendance Required:
   a. Contractor.
   b. District and relevant staff.
   c. Architect.
   d. Installer's Architectural Hardware Consultant (AHC).
   e. Hardware Installer.

f. Owner's Security Consultant.

3. Agenda:
   a. Establish keying requirements.
   b. Verify locksets and locking hardware are functionally correct for project requirements.
   c. Verify that keying and programming complies with project requirements.
   d. Establish keying submittal schedule and update requirements.
4. Contractor to provide a blank key schedule in excel format for District review and approval prior to formal submittal.
5. Incorporate "Keying Requirements Meeting" decisions into keying submittal upon review of door hardware keying system including, but not limited to, the following:
   a. Access control requirements.
   b. Key control system requirements.
   c. Schematic diagram of preliminary key system.
6. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, District, participants, and those affected by decisions made.
   a. Furnish District's written approval of the system; do not order keys or cylinders without written confirmation of actual requirements from the District.
7. Deliver established keying requirements to manufacturers.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Highlight, encircle, or otherwise specifically identify on submittals deviations from Contract Documents, issues of incompatibility or other issues which may detrimentally affect the Work

C. Product Data: Manufacturer's catalog literature for each type of hardware, marked to clearly show products to be furnished for this project, and includes construction details, material descriptions, finishes, and dimensions and profiles of individual components.

D. Shop Drawings - Door Hardware Schedule: Submit detailed listing that includes each item of hardware to be installed on each door. Use door numbering scheme as included in Contract Documents.
   1. Prepared by or under supervision of Architectural Hardware Consultant (AHC).
   2. Comply with DHI (H&S) using door numbers and hardware set numbers as indicated in construction documents.
      a. Submit in vertical format; see Section 08 0671.
   3. List groups and suffixes in proper sequence.
   4. Provide complete description for each door listed.
   5. Provide manufacturer name, product names, and catalog numbers; include functions, types, styles, sizes and finishes of each item.
   6. Include account of abbreviations and symbols used in schedule.

E. Samples for Verification:
   1. Submit minimum size of 2 by 4 inch for sheet samples, and minimum length of 4 inch for other products.
   2. Submit one (1) sample of hinge, latchset, lockset, and closer illustrating style, color, and finish.
   3. Return full-size samples to be incorporated into this Work.
   4. Submit product description with samples.

F. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

G. Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.
   1. Submit manufacturer's parts lists and templates.
   2. Bitting List: List of combinations as furnished.

H. Keying Schedule:
   1. Submit three (3) copies of Keying Schedule in compliance with requirements established during Keying Requirements Meeting unless otherwise indicated.

I. Manufacturer's qualification statement.

J. Installer's qualification statement.

K. Supplier's qualification statement.

L. District Responsibilities for submittal review:
   1. Complete keying schedule.
   2. Complete keying legend.
   3. Provide original letter of authorization allowing hardware supplier to purchase keying hardware and to have the bitting list sent to District.
   4. Provide District the locksmith's name, address, phone number and email.
   5. Identify how doors are to be keyed.
   6. For existing systems, provide the registry number.

M. Manufacturers' certificates that fire-rated hardware meets or exceeds specified requirements.

N. Project Record Documents: Record actual locations of concealed equipment, services, and conduit.
   1. Include keying schedule, riser and point-to-point wiring diagrams, manufacturers' installation, adjustment and maintenance information, and supplier's final inspection report

O. Maintenance Materials and Tools: Furnish the following for District's use in maintenance of project.
   1. See Section 01 60 00 - Product Requirements, for additional provisions.
   2. Lock Cylinders: Ten for each master keyed group.
   3. Temporary Cores: Return to and receipt by Contractor.

4. Tools: Two sets of each special wrench or tool applicable for each different or special hardware component, whether supplied by hardware component manufacturer or not.

1.06 QUALITY ASSURANCE

A. Standards for Fire-Rated Doors: Maintain one copy of each referenced standard on site, for use by Architect and Contractor.

B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years of documented experience.

C. Installer Qualifications: Company specializing in performing work of the type specified for commercial door hardware with at least three years of documented experience.

D. Supplier Qualifications: Company with certified Architectural Hardware Consultant (AHC) to assist in work of this section.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Package hardware items individually; label and identify each package with door opening code to match door hardware schedule.

1.08 PROJECT CONDITIONS AND COORDINATION:

A. Where exact types of hardware specified are not adaptable to finished shape or size of members requiring hardware, provide suitable types having as nearly as practical the same operation and quality as type specified, subject to Architect's approval.

B. Coordination:

1. Coordinate hardware with other work.
2. Provide hardware items of proper design for use on doors and frames of the thickness, profile, swing, security and similar requirements indicated, as necessary for proper installation and function, regardless of omissions or conflicts in the information on the Contract Documents.
3. Furnish related trades with the following information:
    a. Location of embedded and attached items to concrete.
    b. Location of wall-mounted hardware, including wall stops.
    c. Location of finish floor materials and floor-mounted hardware.
    d. Coordinate: flush top rails of doors at outswinging exteriors, and throughout where adhesive-mounted seals occur.
    e. Manufacturers' templates to door and frame fabricators.

C. Check Shop Drawings for doors and entrances to confirm that adequate provisions will be made for proper hardware installation.

1.09 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Manufacturer's Warranty: Provide warranty against defects in material and workmanship for period indicated. Complete forms in District's name and register with manufacturer.

1. Mechanical Closers: Thirty years, minimum.
2. Mechanical Exit Devices: Three years, minimum.
3. Mechanical Locksets and Cylinders: Three years, minimum.
4. Continuous and Butt Hinges: Life of the building.
5. Key Blanks: Lifetime
6. Other Hardware: Two years, minimum.

C. Warranty does not cover damage or faulty operation due to improper installation, improper use or abuse.

PART 2 PRODUCTS

2.01 DESIGN AND PERFORMANCE CRITERIA

A. Provide specified door hardware as required to make doors fully functional, compliant with applicable codes, and secure to extent indicated.

B. Provide individual items of single type, of same model, and by same manufacturer.

C. Regulatory Requirements:

1. Fire-Rated Openings: Comply with NFPA 80. Provide only hardware tested and listed by UL for the type and size of each door required, which complies with the requirements of the door and frame labels. California State Fire Marshall Standard 12-7-4
    a. Where exit devices are required on fire rated doors, provide supplementary marking on door UL label indicating “Fire Door to be Equipped with Fire Exit Hardware”, and provide UL label on exit device indicating “Fire Exit Hardware”.
2. Comply with State Fire Marshal Standards.
    a. Lever of lever actuated latches or locks shall be curved with a return to within 1/2 inch of the door to prevent catching on the clothing of persons during egress. SFM 12-10-2 Latching/Locking, Section 12-10-202(f).
    b. The cross-bar shall extend across not less than one-half the width of the door/gate. 12-10-3 Exits, Section 12-10-302(a).
    c. The ends of the cross-bar shall be curved, guarded or otherwise designed to prevent catching on the clothing of persons during egress. SFM 12-10-3 Exits, Section 12-10-302(d).
3. Conform to applicable requirements of the CBC Chapter 11B and ADA Standards regarding accessibility requirements for door and entrance hardware including gates.
    a. Doors shall meet California Building Code Sections 11B-206.5, 11B-404.1 and 1010.1.
    b. Doors/doorways as part of an accessible route shall comply with CBC Sections 11B-404.

c. The clear opening width for a door shall be 32 inches minimum. For a swinging door it shall be measured between the face of the door and the stop, with the door open 90 degrees. There shall be no projections into it below 34 inches; up to 4 inches maximum projections are allowed between 34 inches and 80 inches above the finish floor or ground. Door closers and stops shall be permitted to be 78 inches minimum above the finish floor or ground. CBC Section 11B-404.2.3

d. Thresholds shall comply with CBC Section 11B-404.2.5.

e. Handles, pulls, latches, locks, and other operable parts on accessible doors shall comply with CBC Section 11B-309.4 and shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. Operable parts of such hardware shall be 34 inches minimum and 44 inches maximum above finish floor or ground. Where sliding doors are in the fully open position, operating hardware shall be exposed and usable from both sides. CBC Section 11B-404.2.7

f. The force for pushing or pulling open a door shall be as follows, per CBC Section 11B-404.2.9:

   1) Interior hinged doors, sliding or folding doors, and exterior hinged doors: 5 pounds (22.2 N) maximum.

   2) Required fire doors: the minimum opening force allowable by the appropriate administrative authority, not to exceed 15 pounds (66.7 N).

   3) The force required for activating any operable parts, such as lever hardware, or disengaging other devices shall be 5 pounds (22.2N) maximum to comply with CBC Section 11B-309.4.

g. Door closing speed shall be as follows per CBC Section 11B-404.2.8:

   1) Closer shall be adjusted so that the required time to move a door from an open position of 90 degrees to a position of 12 degrees from the latch is 5 seconds minimum.

h. Spring hinges shall be adjusted so that the required time to move a door from an open position of 70 degrees to the closed position is 1.5 seconds minimum.

i. Floor stops shall not be located in the path of travel and 4 inches maximum from walls.

j. Hardware (including panic hardware) shall not be provided with “Night Latch” (NL) function for any accessible doors or gates unless the following conditions are met: (Such conditions must be clearly demonstrated and indicated in the specifications)

   1) Such hardware has a ‘dogging’ feature.

   2) It is dogged during the time the facility is open.

   3) Such ‘dogging’ operation is performed only by employees as their job function (non-public use).

4. Door and door hardware encroachment: when door is swung fully-open into means-of-egress path, the door, including the hardware, may not encroach or project more than 7 inches into the required exit width. California Building Code 1005.7.1.

5. Education Code (EDC) Section 17583 (SB/AB 211 & AB 3205) - DSA Bulletins, DSA BU 11-05, DSA BU 19-05, and DSA BU 24-04.

a. Provide all latching devices that are lockable (including but not limited to door locks and panic/exit devices) that comply with CBC 1010.2.8.2 and 1010.2.9:

1) All new construction projects to include locks that allow the doors to be locked from the inside.

2) The requirement applies to classrooms and any other room with an occupancy of 5 or more persons, but does not include doors that are locked from the outside at all times or student restrooms.

D. Provide door hardware products that comply with the following requirements:

1. Applicable provisions of federal, state, and local codes.
2. Comply with DSA BU 11-05, DSA BU 19-05, and DSA BU 24-04 ; CBC section 1010.2.8.2 and 1010.2.9.
3. Accessibility: ADA Standards, CBC Chapter 11B.
4. Fire-Rated Doors: NFPA 80, listed and labeled by qualified testing agency for fire protection ratings indicated, based on testing at positive pressure in accordance with NFPA 252 or UL 10C.
5. Hardware on Fire-Rated Doors: Listed and classified by UL (DIR), ITS (DIR), or testing firm acceptable to authorities having jurisdiction as suitable for application indicated.
   a. Latching hardware, door closers, ball bearing hinges, and seals are required whether listed in the Hardware Schedule or not.
6. Hardware for Smoke and Draft Control Doors (Indicated as "S" on Drawings): Provide door hardware that complies with local codes, and requirements of assemblies tested in accordance with UL 1784.
   a. Air Leakage Rate: Tested in accordance with UL 1784, with air leakage rate not to exceed 3.0 cfm/sf of door opening at 0.10 inch of water for both ambient and elevated temperature tests.
7. Listed and certified compliant with specified standards by BHMA (CPD).
8. Auxiliary Hardware: BHMA A156.16.
9. Straps and Tee Hinges: BHMA A156.20.
10. Hardware Preparation for Steel Doors and Steel Frames: BHMA A156.115.

E. Lock Function: Provide lock and latch function numbers and descriptions of manufacturer's series. See Door Hardware Schedule.

1. Exit Doors: Openable at all times from the inside without the use of a key or any special knowledge or effort.

F. Fasteners:

1. Provide fasteners of proper type, size, quantity, and finish that comply with commercially recognized standards for proposed applications.
   a. Aluminum fasteners are not permitted.
   b. Provide phillips flat-head screws with heads finished to match door surface hardware unless otherwise indicated.

2. Provide machine screws for attachment to reinforced hollow metal and aluminum frames.
    a. Self-drilling (Tek) type screws are not permitted.
3. Provide stainless steel machine screws and expansion shields for concrete and masonry substrates.
4. Coordinate With Doors: Ensure provision of proper blocking to support machine screws at metal doors/frames to mounting panic hardware and door closers.
5. No through-bolts are allowed on any door type.
6. Fire-Rated Applications: Comply with NFPA 80.
    a. Provide wood or machine screws for hinges mortised to doors or frames, strike plates to frames, and closers to doors and frames.
    b. Provide steel through bolts for attachment of surface mounted closers, hinges, or exit devices to door panels unless proper door blocking is provided.
7. Concealed Fasteners: Do not use through or sex bolt type fasteners on door panel sides indicated as concealed fastener locations, unless otherwise indicated.

2.02 HINGES

A. Hinges: Comply with BHMA A156.1, Grade 1.
    1. Self Closing Hinges: Comply with BHMA A156.17.
    2. Butt Hinges: Comply with BHMA A156.1 and BHMA A156.7 for templated hinges.
        a. Provide hinge width required to clear surrounding trim.
        b. Drawings typically depict doors at 90 degrees, doors will actually swing to maximum allowable.
            1) Use wide-throw conventional or continuous hinges as needed up to 8 inches in width to allow door to stand parallel to wall for true 180-degree opening.
            2) Advise Architect if 8 inch width is insufficient.
        c. Conform to manufacturer's published hinge selection standard for door dimensions, weight and frequency, and to hinge selection as scheduled.
            1) Where manufacturer's standard exceeds the scheduled product, furnish the heavier of the two choices, notify Architect of deviation from scheduled hardware.
        d. Conventional Hinges: Steel or stainless steel pins and concealed bearings. Hinge open widths minimum, but of sufficient throw to permit maximum door swing.
    3. Continuous Hinges: Comply with BHMA A156.26.
        a. Geared-type aluminum.
            1) Use wide-throw units where needed for maximum degree of swing, advise Architect if commonly available hinges are insufficient.
            2) If units are used at storefront openings, color-coordinate hinge finish with storefront color.

(a) Custom anodizing and custom powdercoat finishes subject to Architect approval.

4. Provide hinges on every swinging door.
5. Provide five-knuckle full mortise butt hinges unless otherwise indicated.
6. Provide ball-bearing hinges at each door with closer.
7. Provide non-removable pins on exterior outswinging doors.
   a. Out-swinging exterior doors: Non-ferrous with non-removable (NRP) pins and security studs.
   b. Non-ferrous material exteriors and at doors subject to corrosive atmospheric conditions.
8. Provide non-removable pins on interior outswinging doors at locations as indicated in Door Hardware Schedule.
9. Provide following quantity of butt hinges for each door:
   a. Doors up to 60 inches High: Two hinges.
   b. Doors From 60 inches High up to 90 inches High: Three hinges.
   c. Doors 90 inches High up to 120 inches High: Four hinges.

2.03 EXIT DEVICES

A. Comply with Bulletins DSA BU 11-05 and DSA BU 19-05); CBC Section 1010.2.8.2 and 1010.2.9.

B. Exit Devices: Comply with BHMA A156.3, Grade 1.
   1. Lever design to match lockset trim.
      a. Where lever handles are specified as outside trim for exit devices, provide heavy-duty lever trims with forged or cast escutcheon plates. Provide vandal-resistant levers that will travel to 90-degree down position when more than 35 pounds of torque are applied, and which can easily be re-set.
         1) Lever Style: Match lever style of locksets.
         2) Tactile Warning (Knurling): Where required by authority having jurisdiction. Provide on levers on exterior (secure side) of doors serving rooms considered to be hazardous.
   2. Provide cylinder with cylinder dogging or locking trim on fire non-rated doors.
   3. Provide exit devices properly sized for door width and height.
   4. Provide strike as recommended by manufacturer for application indicated.
   5. Releasable in normal operation with 5-lb. maximum operating force per CBC Ch. 11B-309.4.
   6. Readily openable from egress side with one hand and without tight grasping, tight pinching, or twisting of the wrist to operate.
   7. Comply with CBC Section 1010.2.9 and State Fire Marshal Standard 12-10-3 Exits, Section 12-10-302.
   8. Trim to meet BHMA A156.3 Trim Security Test.

9. Provide weather-resistant devices when installed on exterior gates.
10. Independent lab-tested 1,000,000 cycles.
11. Provide UL (DIR) listed exit device assemblies for fire-rated doors and panic device assemblies for non-fire-rated doors.
    a. Provide UL 305 listed; UL 10C listed or UL 305 listed for rated per CBC 1010.2.8.

2.04 LOCK CYLINDERS

A. Lock Cylinders: Provide key access on outside of each lock, unless otherwise indicated.
1. Provide standard, conventional, and full size interchangeable core (FSIC) type cylinders, Grade 1, with six-pin core in compliance with BHMA A156.5 at locations indicated.
2. Provide cylinders from same manufacturer as locking device.
3. Provide cams and/or tailpieces as required for locking devices.
4. Furnish keyed at factory of lock manufacturer where permanent records are maintained.
5. Locks and cylinders by the same manufacturer.
6. Within specific Door Sections, when provisions for lock cylinder are being referenced to this Section, provide specified lock cylinder and keyed to building keying system, unless otherwise indicated.

2.05 MORTISE LOCKS

A. Comply with Bulletins DSA BU 11-05 and DSA BU 19-05; CBC section 1010.2.8.2.
B. Mortise Locks: Complying with BHMA A156.13, Grade 1.
1. Latchbolt Throw: 3/4 inch, minimum.
2. Deadbolt Throw: 1 inch, minimum.
3. Backset: 2-3/4 inch unless otherwise indicated.
4. Strikes: Provide manufacturer's standard strike for each latchset or lockset with strike box and curved lip extending to protect frame in compliance with indicated requirements.
    a. Flat-Lip Strikes: Provide for locks with three piece antifriction latchbolts as recommended by manufacturer.
    b. Rabbet Front and Strike: Provide on locksets for use with rabbeted meeting rails.
    c. Finish: To match lock or latch.
5. Lever Trim**:** through-bolted, accessible design, cast lever or solid extruded bar type levers as scheduled. Filled hollow tube design unacceptable.
    a. Spindles**:** security design independent breakaway. Breakage of outside lever does not allow access to inside lever's hubworks to gain wrongful entry.
    b. Inside lever applied by screwless shank mounting – no exposed trim mount screws.
    c. Levers rotate up or down for ease of use.
    d. Solid brass, bronze, or stainless steel, cast or forged in design specified, with wrought roses and external lever spring cages. Provide thru-bolted levers with 2-piece spindles.

C. Door shall be openable from inside with a single motion w/o the use of any tools, effort , or special knowledge.

2.06 DOOR PULLS AND PUSH PLATES

A. Door Pulls and Push Plates: Comply with BHMA A156.6.

1. Pull Type: Straight, unless otherwise indicated.
2. Push Plate Type: Flat, with square corners, unless otherwise indicated.
    a. Edges: Beveled, unless otherwise indicated.
3. Material: Stainless steel, unless otherwise indicated.
4. Provide door pulls and push plates on doors without a lockset, latchset, exit device, or auxiliary lock unless otherwise indicated.
5. On solid doors, provide matching door pull and push plate on opposite faces.
6. On glazed storefront doors, provide matching door pulls/push plates on both faces unless otherwise indicated.

2.07 CLOSERS

A. Closers: Comply with BHMA A156.4, Grade 1.

1. Type: Surface mounted to door.
2. Provide door closer on each exterior door.
3. Provide door closer on each fire-rated and smoke-rated door.
    a. Spring hinges are not an acceptable self-closing device, unless otherwise indicated.
4. Operating Force: Adjustable to maximum 5 lbs operating force. Comply with ADA Standards and CBC Ch. 11B.
5. Where an overlapping astragal is included on pairs of swinging doors, provide coordinator to ensure door leaves close in proper order.
6. At corridor entry doors, mount closer on room side of door.
7. At outswinging exterior doors, mount closer on interior side of door.

2.08 OVERHEAD STOPS AND HOLDERS

A. Overhead Stops and Holders (Door Checks): Comply with BHMA A156.8, Grade 1.

1. Provide stop for every swinging door, unless otherwise indicated.
2. Stop is not required if positive stop feature is specified for door closer; positive stop feature of door closer is not an acceptable substitute for a stop, unless otherwise indicated.

2.09 KICK PLATES

A. Kick Plates: Provide along bottom edge of push side of every door with closer, except aluminum storefront and glass entry doors, unless otherwise indicated.

1. Size: 12 inch high by 2 inch less door width (LDW) on push side of door.

2.10 DOOR HOLDERS

A. Door Holders: Comply with BHMA A156.16, Grade 1.

1. Provide surface mounted door holders when wall or floor stop is not applicable and hold-open device is mounted on door.
2. Type: Lever, or kick down stop, with rubber bumper at bottom end.
3. Material: Stainless steel.

2.11 FLOOR STOPS

A. Floor Stops: Comply with BHMA A156.16, Grade 1 and Resilient Material Retention Test as described in this standard.

1. Provide floor stops when wall surface is not available; be cautious not to create a tripping hazard.
2. Type: Manual hold-open, with pencil floor stop.
3. Material: Aluminum housing with rubber insert.

2.12 WALL STOPS

A. Wall Stops: Comply with BHMA A156.16, Grade 1 and Resilient Material Retention Test as described in this standard.

1. Provide wall stops to prevent damage to wall surface upon opening door.
2. Type: Bumper, concave, wall stop.
3. Material: Aluminum housing with rubber insert.

2.13 THRESHOLDS

A. Thresholds: Comply with BHMA A156.21.

1. Provide threshold at interior doors for transition between two different floor types, and over building expansion joints, unless otherwise indicated.
2. Provide threshold at each exterior door, unless otherwise indicated.
3. Provide threshold with Sound Transmission Class (STC) of 25-30 at locations indicated.
4. Type: Flat surface.
5. Material: Aluminum.
6. Threshold Surface: Fluted horizontal grooves across full width.
7. Field cut threshold to profile of frame and width of door sill for tight fit.
8. Provide non-corroding fasteners at exterior locations.

2.14 WEATHERSTRIPPING AND GASKETING

A. Rigid Seals:

1. Weatherstripping and Gasketing: Comply with BHMA A156.22.
   a. Head and Jamb Type: Adjustable.
   b. Door Sweep Type: Encased in retainer.

c. Material: Aluminum, with brush weatherstripping.

d. Provide gasketing for smoke and draft control doors (Indicated as "S" on Drawings) that complies with local codes, requirements of assemblies tested in accordance with UL 1784.

e. Provide weatherstripping on each exterior door at head, jambs, and meeting stiles of door pairs, unless otherwise indicated.

f. Provide door bottom sweep on each exterior door, unless otherwise indicated.

g. Provide sound-rated gasketing and automatic door bottom on doors indicated as "Sound-Rated", "Acoustical", or with "Sound Transmission Class (STC) rating"; fabricate as continuous gasketing, do not cut or notch gasketing material.

B. Adhesive Seals and Bottoms:

1. Weatherstripping and Gasketing: Comply with BHMA A156.22.

a. Head and Jamb Type: Self-adhesive.

b. Door Sweep Type: Encased in retainer.

c. Material: Aluminum, with brush weatherstripping.

d. Provide weatherstripping on each exterior door at head, jambs, and meeting stiles of door pairs, unless otherwise indicated; .

e. Provide door bottom sweep on each exterior door, unless otherwise indicated.

2.15 SIGNAGE

A. See Section 10 14 23 - Panel Signage for additional signage requirements.

2.16 SILENCERS

A. Silencers: Provide at equal locations on door frame to mute sound of door's impact upon closing.

1. Single Door: Provide three on strike jamb of frame.

2. Pair of Doors: Provide two on head of frame, one for each door at latch side.

3. Material: Rubber, gray color.

2.17 KEY CONTROL SYSTEMS

A. Key Control Systems: Comply with guidelines of BHMA A156.28.

1. Provide keying information in compliance with DHI (KSN) standards.

2. Keying: Grand master keyed.

3. Include construction keying and control keying with removable core cylinders.

a. Provide temporary keyed-alike cores.

b. Remove at substantial completion and install permanent cylinders/cores in District's presence.

1) Demonstrate that construction key no longer operates.

4. Key to existing keying system.

a. Factory registered master key system.
b. Restricted keyway, interchangeable core.
c. Contact District Locksmith with for keying requirements.
d. Key blanks available only from factory-direct sources, not available from after-market key blank manufacturers.
e. For estimate use factory GMK charge.
f. Furnish District's written approval of the system.

5. Supply keys in following quantities:
   a. 4 each Master keys.
   b. 1 each Grand Master keys.
   c. 6 each Construction Master keys.
   d. 15 each Construction keys.
   e. 2 each Construction Control keys.
   f. 2 each Control keys if new system.
   g. 2 each Extra Cylinder cores.
   h. 2 each Change keys for each keyed core.
6. Key Management System: For each keyed lock on project, provide one set of consecutively numbered duplicate key tags with hanging hole and snap catch.
7. Security Key Tags: For each keyed lock on project, provide one set of matching key tags for permanent attachment to one key of each set.
8. Provide key collection envelopes, receipt cards, and index cards in quantity suitable to manage number of keys.
9. Deliver keys with identifying tags to District by security shipment direct from hardware supplier.
10. Bitting List: Use secured shipment direct from point of origination to District upon completion.
11. Permanent Keys and Cores: Stamped with applicable key marking for identification. Do not include actual key cuts within visual key control marks or codes. Stamp permanent keys "Do Not Duplicate."

2.18 KEY CABINET

A. Key Cabinet: Sheet steel construction, piano hinged door with key lock; BHMA A156.28.
   1. Mounting: Wall-mounted.
   2. Capacity: Actual quantity of keys, plus 25 percent additional capacity.
   3. Size key hooks to hold 6 keys each.
   4. Finish: Baked enamel, manufacturer's standard color.
   5. Key cabinet lock to building keying system.

2.19 FIRE DEPARTMENT LOCK BOX

A. Manufacturers:

1. Knox Company; Knox-Box Rapid Entry System: www.knoxbox.com.
2. Substitutions: See Section 01 60 00 - Product Requirements.

B. Fire Department Lock Box: at Buildings or Site Walls

1. Heavy-duty, recessed, solid stainless-steel box with hinged door and interior gasket seal; single drill resistant lock with dust covers and tamper alarm.
2. Capacity: Holds 10 keys.
3. Finish: Manufacturer's standard dark bronze.
4. Mounted to posts at manual gates (for driveways/roads) and as indicated on Drawings:
    a. Key lock boxes shall be located at driver's side of gate entrance in a visible location as directed by Fire Department.
        1) Box shall be welded secure to metal posts. Box shall be 4 to 4-1/2 feet from top of box to finished grade.
    b. Obtain approval from Fire Department of mounting location/position and operating standards before installation.
    c. Products:
        1) Knox Company; Model 3208 or 3166, as applicable.
        2) Knox Decal 1001 shall be placed on gate.
        3) Substitutions: See Section 01 60 00 - Product Requirements. Only if allowed or required by local Fire Department.

C. Provide Knox Fire Department alert decals on all exterior doors of the facility and on all interior doors that keys have been furnished for within the lock box.

1. If the building/facility is protected with a fire alarm system or burglar alarm system, the lock boxes shall be “tamper” monitoring.
2. The tamper monitoring must include the following:
    a. All central stations shall be UL listed.
    b. For combination Fire/Burglar Alarm Panels, the Knox Box monitoring shall be through the fire side of the panel.
    c. Central stations upon receiving a Knox Box tamper alarm signal shall:
        1) Notify and respond to local Police Department (Knox Box tamper).
        2) Notify and respond to the local Fire Department (Knox Box tamper).

2.20 FINISHES

A. Finishes: Identified in Section 08 0671 - Door Hardware Schedule.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that doors and frames are ready to receive this work; labeled, fire-rated doors and frames are properly installed, and dimensions are as indicated on shop drawings.

3.02 INSTALLATION

A. Install hardware in accordance with manufacturer's instructions and applicable codes.
   1. Locate hardware per SDI-100 and applicable building, fire, life-safety, accessibility, and security codes.
   2. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate for proper installation and operation. Remove and reinstall or replace work deemed defective by Architect.
      a. Gaskets:
         1) Install jamb-applied gaskets before closers, overhead stops, rim strikes, etc; fasten hardware over and through these seals.
         2) Install sweeps across bottoms of doors before astragals, cope sweeps around bottom pivots, trim astragals to tops of sweeps.
      b. Use manufacturers' fasteners furnished with hardware items, or submit Request for Substitution with Architect.
      c. Replace fasteners damaged by power-driven tools.
   3. Core concrete for exterior door stop anchors. Set anchors in approved non-shrink grout.
   4. Lubricate and adjust existing hardware scheduled to remain. Carefully remove and give to District items not scheduled for reuse.

B. Install hardware on fire-rated doors and frames in accordance with applicable codes and NFPA 80.

C. Install hardware for smoke and draft control doors in accordance with NFPA 105.

D. Use templates provided by hardware item manufacturer.

E. Do not install surface mounted items until application of finishes to substrate are fully completed.

F. Door Hardware Mounting Heights: Distance from finished floor to center line of hardware item. As indicated in following list; unless noted otherwise in Door Hardware Schedule or on drawings.
   1. Comply with California Building Code, Section 1010.2.3, 11B-309.4 and 11B-404.2.7.
      a. Refer also to CBC requirements noted in Part 1 of this section.
   2. For Steel Doors and Frames: See Section 08 11 13.
   3. Mounting heights in compliance with ADA Standards and CBC Chapter 11B:
      a. Locksets: 34 to 44 inches.
      b. Push/Pulls: 34 to 44 inches.
      c. Dead Locks: 44 inches.

d. Exit Devices: 36 (clear) to 44 inches to top.

e. Where new hardware is to be installed near existing doors/hardware scheduled to remain, match locations of existing hardware when compliant with codes.

G. Set exterior door thresholds with full-width bead of elastomeric sealant at each point of contact with floor providing a continuous weather seal; anchor thresholds with stainless steel countersunk screws.

1. See Section 07 92 00 for additional requirements.

H. Locate floor stops no more that 4 inches (maximum outside dimension) from walls and not within paths of travel. See Article "Hinges" in Part 2 regarding hinge widths, door should be well clear of point of wall reveal. Point of door contact no closer to the hinge edge than half the door width. Where situation is questionable or difficult, contact Architect for direction.

I. Locate overhead stops for minimum 90 degrees at rest and for maximum allowable degree of swing.

3.03 FIELD QUALITY CONTROL

A. Perform field inspection and testing under provisions of Section 01 40 00 - Quality Requirements.

B. Provide an Architectural Hardware Consultant (AHC) to inspect installation and certify that hardware and installation has been furnished and installed in accordance with manufacturer's instructions and as specified.

3.04 ADJUSTING

A. Adjust work under provisions of Section 01 70 00 - Execution and Closeout Requirements.

B. Adjust hardware for smooth operation.

1. Adjust and check for proper operation and function. Replace units, which cannot be adjusted to operate freely and smoothly.

a. Hardware damaged by improper installation or adjustment methods: repair or replace to District’s satisfaction.

b. Adjust doors to fully latch with no more than 1 pound of pressure.

c. Adjust delayed-action closers on fire-rated doors to fully close from fully-opened position in no more than 10 seconds.

d. Adjust door closers per "Commissioning" article below.

C. Adjust gasketing for complete, continuous seal; replace if unable to make complete seal.

D. Fire-rated doors (NFPA 80):

1. Steel Doors: Adjust to 1/16 inch minimum to 3/16 inch maximum clearance at heads, jambs, and meeting stiles.

2. Adjust wood and steel doors to 3/4 inch maximum clearance (undercut) above threshold or finish floor material under door.

E. Inspection of fire door assemblies and means-of-egress panic-hardware doors:

1. Per NFPA 80 5.2.1:

a. Provide an independent third-party inspection service to prepare a report listing these doors, and include a statement that there are zero deficiencies with the fire-rated assemblies and the openings with panic hardware.

b. Certification, Testing and Quality Control shall be in accordance with Section 01 45 33 - Code-Required Special Inspections and Procedures.

c. All doors hardware and installation will be inspected by a third party selected by the Architect/District.

F. Final inspection: Installer to provide letter to District that upon completion installer has visited the Project and has accomplished the following:

1. Has re-adjusted hardware.
2. Has evaluated maintenance procedures and recommend changes or additions, and instructed District's personnel.
3. Has identified items that have deteriorated or failed.
4. Has submitted written report identifying problems.

3.05 COMMISSIONING:

A. Conduct these tests prior to request for certificate of substantial completion:

1. Inspection of fire door assemblies and means-of-egress panic-hardware doors:
   a. Contractor shall provide an independent third-party inspection service to prepare a report listing the proper operation and functionality of these doors.
   b. Include a statement that there are zero deficiencies with the fire-rated assemblies and the openings with panic hardware.
2. With installer present, test door hardware operation for compliance with push and pull force requirements per ADA and CBC.

3.06 CLEANING

A. Clean finished hardware in accordance with manufacturer's written instructions after final adjustments have been made.

B. Clean adjacent surfaces soiled by hardware installation.

C. Replace items that cannot be cleaned to manufacturer's level of finish quality at no additional cost.

D. See Section 01 74 19 - Construction Waste Management and Disposal for additional requirements.

3.07 PROTECTION

A. Protect finished Work under provisions of Section 01 70 00 - Execution and Closeout Requirements.

B. Do not permit adjacent work to damage hardware or finish.

3.08 CLOSEOUT

A. Return of temporary cores for return/receipt by Contractor.

B. Final inspection: Installer to provide letter to District that upon completion installer has visited the Project and has accomplished the following:

1. Has re-adjusted hardware.
2. Has evaluated maintenance procedures and recommend changes or additions, and instructed District's personnel.
3. Has identified items that have deteriorated or failed.
4. Has submitted written report identifying problems.

3.09 SCHEDULE OF FINISH HARDWARE

A. See door schedule in drawings for hardware set assignments.

B. No hardware shall be ordered until Finish Hardware has been reviewed and approved by Architect's hardware consultant.

C. Provide Factory order numbers for all products supplied on this project as part of close out documents for Owner's warranty records.

D. See schedule in Section 08 06 71 - Door Hardware Schedule.

END OF SECTION

SECTION 09 05 61
COMMON WORK RESULTS FOR FLOORING PREPARATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This section applies to floors identified in Contract Documents that are receiving the following types of floor coverings:
   1. Resilient tile and sheet.
      a. Moisture vapor seal is required at all locations to receive resilient flooring regardless of moisture test.
   2. Broadloom carpet.
   3. Carpet tile.
      a. Moisture vapor seal is required at all locations to receive adhesive-applied flooring regardless of moisture test.
   4. Thin-set ceramic tile and stone tile.
   5. Fluid-Applied flooring
      a. Moisture vapor seal is required at all locations to receive fluid-applied flooring regardless of moisture test.

B. Removal of existing floor coverings.

C. Preparation of new concrete floor slabs for installation of floor coverings.

D. Testing of concrete floor slabs for moisture and alkalinity (pH).

E. Remediation of concrete floor slabs due to unsatisfactory moisture or alkalinity (pH) conditions.
   1. Contractor shall perform all specified remediation of concrete floor slabs. If such remediation is indicated by testing agency's report and is due to a condition not under Contractor's control or could not have been predicted by examination prior to entering into the contract, a contract modification will be issued.

F. Patching compound.

G. Remedial floor coatings.

H. Preparation of new and existing wood-based floors and subfloors for installation of new floor coverings.

1.02 RELATED REQUIREMENTS

A. Section 01 40 00 - Quality Requirements: Additional requirements relating to testing agencies and testing.

B. Section 01 74 19 - Construction Waste Management and Disposal: Handling of existing floor coverings removed.

C. Section 03 30 00 - Cast-in-Place Concrete: Moisture emission reducing curing and sealing compound for slabs to receive adhered flooring, to prevent moisture content-related flooring failures; to remain in place, not to be removed.

D. Section 03 30 00 - Cast-in-Place Concrete: Limitations on curing requirements for new concrete floor slabs.

1.03 REFERENCE STANDARDS

A. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 50 mm [2 in.] Cube Specimens).

B. ASTM C472 - Standard Test Methods for Physical Testing of Gypsum, Gypsum Plasters, and Gypsum Concrete.

C. ASTM D4259 - Standard Practice for Preparation of Concrete by Abrasion Prior to Coating Application.

D. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.

E. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.

F. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.

G. RFCI (RWP) - Recommended Work Practices for Removal of Resilient Floor Coverings.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate scheduling of cleaning and testing, so that preliminary cleaning has been completed for at least 24 hours prior to testing.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Visual Observation Report: For existing floor coverings to be removed.

C. Floor Covering and Adhesive Manufacturers' Product Literature: For each specific combination of substrate, floor covering, and adhesive to be used; showing:

1. Moisture and alkalinity (pH) limits and test methods.
2. Manufacturer's required bond/compatibility test procedure.

D. Remedial Materials Product Data: Manufacturer's published data on each product to be used for remediation.

1. Manufacturer's qualification statement.
2. Test reports indicating compliance with specified performance requirements, performed by nationally recognized independent testing agency.
3. Manufacturer's installation instructions.
4. Specimen Warranty: Copy of warranty to be issued by coating manufacturer and certificate of underwriter's coverage of warranty.

E. Testing Agency's Report:

1. Description of areas tested; include floor plans and photographs if helpful.

2. Summary of conditions encountered.
3. Moisture and alkalinity (pH) test reports.
4. Copies of specified test methods.
5. Recommendations for remediation of unsatisfactory surfaces.
6. Submit report to Architect.
7. Submit report not more than two business days after conclusion of testing.

F. Adhesive Bond and Compatibility Test Report.

G. Floor Moisture Testing Technician Certificate: International Concrete Repair Institute (ICRI) Concrete Slab Moisture Testing Technician- Grade I certificate.

H. Copy of RFCI (RWP).

1.06 QUALITY ASSURANCE

A. Moisture and alkalinity (pH) testing shall be performed by an independent testing agency employed and paid by Contractor.

B. Contractor may perform additional adhesive and bond test with Contractor's own personnel or hire a testing agency.

C. Testing Agency Qualifications: Independent testing agency experienced in the types of testing specified.
1. Submit evidence of experience consisting of at least 3 test reports of the type required, with project District's project contact information.

D. Contractor's Responsibility Relating to Independent Agency Testing:
1. Provide access for and cooperate with testing agency.
2. Confirm date of start of testing at least 10 days prior to actual start.
3. Allow at least 4 business days on site for testing agency activities.
4. Achieve and maintain specified ambient conditions.
5. Notify Architect when specified ambient conditions have been achieved and when testing will start.

E. Floor Moisture Testing Technician Qualifications: International Concrete Repair Institute (ICRI) Concrete Slab Moisture Testing Technician Certification- Grade I.

F. Remedial Coating Installer Qualifications: Company specializing in performing work of the type specified in this section, trained by or employed by coating manufacturer, and able to provide at least 3 project references showing at least 3 years' experience installing moisture emission coatings.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, handle, and protect products in accordance with manufacturer’s instructions and recommendations.

B. Deliver materials in manufacturer’s packaging; include installation instructions.

C. Keep materials from freezing.

1.08 FIELD CONDITIONS

A. Maintain ambient temperature in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 65 degrees F or more than 85 degrees F.

B. Maintain relative humidity in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 40 percent and not more than 60 percent.

PART 2 PRODUCTS

2.01 MATERIALS

A. Patching Compound: Floor covering manufacturer's recommended product, suitable for conditions, and compatible with adhesive and floor covering. In the absence of any recommendation from flooring manufacturer, provide a product with the following characteristics:

1. Cementitious moisture-, mildew-, and alkali-resistant compound, compatible with floor, floor covering, and floor covering adhesive, and capable of being feathered to nothing at edges.
2. Latex or polyvinyl acetate additions are permitted; gypsum content is prohibited.
3. Compressive Strength: 3000 psi, minimum, after 28 days, when tested in accordance with ASTM C109/C109M or ASTM C472, whichever is appropriate.
4. Products:
    a. ARDEX Engineered Cements; ARDEX Feather Finish: www.ardexamericas.com/#sle.
    b. Floor Seal Technology, Inc: www.floorseal.com/#sle.
    c. H.B. Fuller Construction Products, Inc; TEC Feather Edge Skim Coat: www.tecspecialty.com/#sle.
    d. Mapei International; Mapei Ultraplan 1 Plus: www.mapei.com.
    e. Sika Corporation; Sika Level-315: www.sikafloorusa.com.
    f. USG Corporation; Durock Brand Advanced Skim Coat Floor Patch: www.usg.com/#sle.
    g. Substitutions: See Section 01 60 00 - Product Requirements.

B. Alternate Flooring Adhesive: Floor covering manufacturer's recommended product, suitable for the moisture and pH conditions present; low-VOC. In the absence of any recommendation from flooring manufacturer, provide a product recommended by adhesive manufacturer as suitable for substrate and floor covering and for conditions present.

C. Remedial Floor Coating, Two-Component: Single-layer coating resistant to water vapor transmission meeting flooring manufacturer's emission limits, resistant to alkalinity (pH) level found, and suitable for flooring adhesion without further treatment.

1. Thickness: As required for application and in accordance with manufacturer's installation instructions.
2. Products:
    a. ARDEX Engineered Cements; ARDEX MC RAPID: www.ardexamericas.com/#sle.

b. Custom Building Products; TechMVC Moisture Vapor and Alkalinity Barrier: www.custombuildingproducts.com/#sle.

c. Floor Seal Technology, Inc; MES 100: www.floorseal.com/#sle.

d. Koster American Corporation; Koster VAP I 2000 with Koster SL Premium overlay: www.kosterusa.com/#sle.

e. LATICRETE International, Inc; LATICRETE VAPOR BAN E: www.laticrete.com/#sle.

f. Maxxon Corporation; Aquafin SG4: www.maxxon.com/#sle.

g. Sika Corporation; Sikafloor Moisture Tolerance Epoxy Primer: www.sikafloorusa.com/#sle.

h. USG Corporation; Durock CoverPrep: www.usg.com/#sle.

i. Substitutions: See Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.01 CONCRETE SLAB PREPARATION

A. Follow recommendations of testing agency.

B. Perform following operations in the order indicated:

1. Existing concrete slabs (on-grade and elevated) with existing floor coverings:
    a. Visual observation of existing floor covering, for adhesion, water damage, alkaline deposits, and other defects.
    b. Removal of existing floor covering.
2. Existing concrete slabs with coatings or penetrating sealers/hardeners/dustproofers:
    a. Do not attempt to remove coating or penetrating material.
    b. Do not abrade surface.
    c. Remove existing coatings and curing agents from surface according to recommendations of remedial coating manufacturer.
    d. Prepare surface according to recommendations of remedial coating manufacturer and according to ASTM D4259.
3. Preliminary cleaning.
4. Moisture vapor emission tests; 3 tests in the first 1000 square feet and one test in each additional 1000 square feet, unless otherwise indicated or required by flooring manufacturer.
5. Internal relative humidity tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
6. Alkalinity (pH) tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
7. Specified remediation, if required.
8. Patching, smoothing, and leveling, as required.
9. Other preparation specified.

10. Adhesive bond and compatibility test.
11. Protection.

C. Remediations:

1. Active Water Leaks or Continuing Moisture Migration to Surface of Slab: Correct this condition before doing any other remediation; re-test after correction.
2. Excessive Moisture Emission or Relative Humidity: If an adhesive that is resistant to the level of moisture present is available and acceptable to flooring manufacturer, use that adhesive for installation of the flooring; if not, apply remedial floor coating or remedial sheet membrane over entire suspect floor area.
3. Excessive Alkalinity (pH): If remedial floor coating is necessary to address excessive moisture, no additional remediation is required; if not, if an adhesive that is resistant to the level present is available and acceptable to the flooring manufacturer, use that adhesive for installation of the flooring; otherwise, apply a skim coat of specified patching compound over entire suspect floor area.

3.02 REMOVAL OF EXISTING FLOOR COVERINGS

A. Comply with local, State, and federal regulations and recommendations of RFCI (RWP), as applicable to floor covering being removed.

B. Dispose of removed materials in accordance with local, State, and federal regulations and as specified.

3.03 PRELIMINARY CLEANING

A. Clean floors of dust, solvents, paint, wax, oil, grease, asphalt, residual adhesive, adhesive removers, film-forming curing compounds, sealing compounds, alkaline salts, excessive laitance, mold, mildew, and other materials that might prevent adhesive bond.

B. Do not use solvents or other chemicals for cleaning.

3.04 MOISTURE VAPOR EMISSION TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.

C. Test in accordance with ASTM F1869 and as follows.

D. Plastic sheet test and mat bond test may not be substituted for the specified ASTM test method, as those methods do not quantify the moisture content sufficiently.

E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if test values exceed 3 pounds per 1000 square feet per 24 hours.

F. Report: Report the information required by the test method.

3.05 INTERNAL RELATIVE HUMIDITY TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.

C. Test in accordance with ASTM F2170 Procedure A and as follows.

D. Testing with electrical impedance or resistance apparatus may not be substituted for the specified ASTM test method, as the values determined are not comparable to the ASTM test values and do not quantify the moisture content sufficiently.

E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if any test value exceeds 75 percent relative humidity.

F. Report: Report the information required by the test method.

3.06 ALKALINITY TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. The following procedure is the equivalent of that described in ASTM F710, repeated here for the Contractor's convenience.

1. Use a wide range alkalinity (pH) test paper, its associated chart, and distilled or deionized water.
2. Place several drops of water on a clean surface of concrete, forming a puddle approximately 1 inch in diameter. Allow the puddle to set for approximately 60 seconds, then dip the alkalinity (pH) test paper into the water, remove it, and compare immediately to chart to determine alkalinity (pH) reading.
3. Use of a digital pH meter with probe is acceptable; follow meter manufacturer's instructions.

C. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if alkalinity (pH) test value is over 10.

3.07 PREPARATION

A. See individual floor covering section(s) for additional requirements.

B. Comply with recommendations of testing agency.

C. Comply with requirements and recommendations of floor covering manufacturer.

D. Fill and smooth surface cracks, grooves, depressions, control joints and other non-moving joints, and other irregularities with patching compound.

E. Do not fill expansion joints, isolation joints, or other moving joints.

3.08 ADHESIVE BOND AND COMPATIBILITY TESTING

A. Comply with requirements and recommendations of floor covering manufacturer.

3.09 APPLICATION OF REMEDIAL FLOOR COATING

A. Comply with requirements and recommendations of coating manufacturer.

B. Install remedial coating over all concrete floor areas where moisture emission and/or alkalinity exceeds the floor covering manufacturer's published limits.

C. Prepare floor areas to be coated in accordance with coating manufacturer's requirements.

1. Mask and protect adjacent wall and floor surfaces from damage due to this work.

D. Apply coating using manufacturer's recommended procedures.

E. Apply 1/8 inch thick cementitious surfacing over coating in areas to receive adhesively applied floor coverings.

F. Verify that prepared floor slab has moisture emission rate and alkalinity meeting requirements.

3.10 APPLICATION OF REMEDIAL FLOOR TREATMENT

A. Comply with requirements and recommendations of treatment manufacturer.

3.11 PROTECTION

A. Cover prepared floors with building paper or other durable covering.

END OF SECTION

SECTION 09 21 16
GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Acoustic insulation.

B. Gypsum sheathing.

C. Cementitious backing board.

D. Gypsum wallboard.

E. Joint treatment and accessories.

1.02 RELATED REQUIREMENTS

A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 07 92 00 - Joint Sealants: Sealing acoustical gaps in construction other than gypsum board or plaster work.

1.03 REFERENCE STANDARDS

A. AISI S220 - North American Standard for Cold-Formed Steel Nonstructural Framing.

B. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures.

C. ASTM A780/A780M - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.

D. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.

E. ASTM C514 - Standard Specification for Nails for the Application of Gypsum Board.

F. ASTM C557 - Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing.

G. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.

H. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.

I. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board.

J. ASTM C1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.

K. ASTM C1396/C1396M - Standard Specification for Gypsum Board.

L. ASTM C1629/C1629M - Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels.

M. ASTM C1658/C1658M - Standard Specification for Glass Mat Gypsum Panels.

N. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.

O. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

P. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.

Q. GA-216 - Application and Finishing of Gypsum Panel Products.

R. UL 2079 - Standard for Tests for Fire Resistance of Building Joint Systems.

S. United States Gypsum Co. (USG) Specification and Technical Bulletins No. SA 923, No. SA 924, and No. SA 925, as applicable for materials location, installation and condition of construction.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate the installation of gypsum board assemblies with size, location, and installation of service utilities.

B. Coordinate gypsum board Work with Work specified in other Sections to properly locate framing members and to provide additional framing and backing as necessary for recessed and built-in components.

C. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by all affected installers.

D. Sequencing: Install service utilities in an orderly and expeditious manner.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data:

1. Provide data on metal framing, gypsum board, glass mat faced gypsum board, accessories, and joint finishing system.

    a. Joint Treatment Materials: Submit manufacturer's product data, indicating VOC content.

C. Shop Drawings: Indicate special details associated with fireproofing and acoustic seals.

D. Application Procedures: Submit a general written description of procedures to be followed where fire-rated work is being done and where alternative assemblies are proposed.

E. Test Reports: For stud framing products that do not comply with AISI S220 or ASTM C754, provide independent laboratory reports showing maximum stud heights at required spacings and deflections.

F. Evaluation Service Reports: Show compliance of grid suspension systems with specified requirements.

G. Installer's Qualification Statement.

1. Including contractor’s recognition in the SFIA “Contractor Certification Program”, or equal.

H. Provide letter from manufacturer that upper and lower track system to be utilized will maintain sound and fire rating of specified assembly.

1.06 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

B. Regulatory Requirements: Conform to California Building Code (CBC), Title 24, Part 2, Chapter 7, Chapter 8,and Chapter 25, as amended and adopted by authorities having jurisdiction.

C. Fire Resistance Rating:

1. Certain partition constructions gypsum wallboard systems are required to meet fire resistive requirements of ASTM E119 and applicable building Codes.
2. Construction which forms component parts of such assemblies shall be constructed to afford the fire resistance required by Code for the location and condition of construction indicated.
3. See required ratings and designs on Drawings.
4. Construction shall conform to requirements of these tested assemblies.
5. Fire Resistive Gypsum Board: Material shall bear the Underwriters' Laboratories, Inc. (UL) label or label of other testing organization acceptable to the State Fire Marshal.

D. Documents at Project Site: Maintain at the project site a copy of manufacturer's instructions, erection drawings, and shop drawings.

1.07 DELIVERY, STORAGE, AND HANDLING

A. See Section 01 74 19 - Construction Waste Management and Disposal for packaging waste requirements.

B. Store gypsum products and accessories indoors and keep above freezing. Elevate boards above floor, on nonwicking supports, in accordance with manufacturer's recommendations.

C. Store metal products to prevent corrosion.

1.08 MOCK-UPS

A. After topping texture has been approved, construct a mock-up not less than 16 square feet in size.

B. Use workmen, equipment and techniques proposed for use on the project.

C. The panel may be constructed as a portion of the finished work, provided the approved panel is clearly identified for future reference.

D. The approved panel shall become the standard of comparison for interior gypsum board work for the project.

1.09 DELIVERY, STORAGE AND HANDLING

A. Deliver gypsum board and accessories in manufacturer's original unopened containers, bundles or rolls bearing manufacturer's identification.

B. Store materials inside the building or in other dry weather tight enclosure. Stack gypsum board flat and off the floor. Do not stack long lengths over shorter lengths.

C. Store flammable adhesives away from fire, sparks and smoking areas.

D. Handle gypsum board to prevent damage to edges, ends, and surfaces.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

A. Provide completed assemblies complying with ASTM C840 and GA-216.

B. Seismic Performance: Ceiling systems designed to withstand the effects of earthquake motions in accordance with ASCE 7 for Seismic Design Category D, E, or F and complying with the following:

1. Local authorities having jurisdiction.

2.02 BOARD MATERIALS

A. General: Gypsum board, joint treatment and finishing materials shall be manufactured from asbestos-free materials.

B. Manufacturers - Gypsum-Based Board:

1. CertainTeed Corporation: www.certainteed.com/#sle.
2. Georgia-Pacific Gypsum: www.gpgypsum.com/#sle.
3. Gold Bond Building Products, LLC provided by National Gypsum Company: www.goldbondbuilding.com/#sle.
4. USG Corporation: www.usg.com/#sle.
5. Substitutions: See Section 01 60 00 - Product Requirements.

C. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.

1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
2. Glass mat faced gypsum panels, as defined in ASTM C1658/C1658M, suitable for paint finish, of the same core type and thickness may be substituted for paper-faced board.
3. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
    a. Mold-resistant board is required whenever board is being installed before the building is enclosed and conditioned.
4. At Assemblies Indicated with Fire-Resistance Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.
5. Thickness:
    a. Vertical Surfaces: 5/8 inch.
    b. Ceilings: 5/8 inch.
    c. Multi-Layer Assemblies: Thicknesses as indicated on drawings.
6. Paper-Faced Products:
    a. CertainTeed Corporation; Type C Drywall: www.certainteed.com/#sle.
    b. CertainTeed Corporation; Type X Drywall: www.certainteed.com/#sle.
    c. Georgia-Pacific Gypsum; ToughRock Fireguard X: www.gpgypsum.com/#sle.
    d. Georgia-Pacific Gypsum; ToughRock Fireguard C: www.gpgypsum.com/#sle.

e. Gold Bond Building Products, LLC provided by National Gypsum Company; Gold Bond Fire-Shield Gypsum Board: www.goldbondbuilding.com/#sle.

f. Gold Bond Building Products, LLC provided by National Gypsum Company; Gold Bond Fire-Shield C 5/8" Gypsum Board: www.goldbondbuilding.com/#sle.

g. USG Corporation; Sheetrock Brand EcoSmart Panels Firecode X 5/8 in. (15.9 mm): www.usg.com/#sle.

h. USG Corporation; Sheetrock Brand Firecode X Panels 5/8 in. (15.9 mm): www.usg.com/#sle.

i. USG Corporation; Sheetrock Brand UltraLight Panels Firecode ULIX 5/8 in. (15.9 mm): www.usg.com/#sle.

j. Substitutions: See Section 01 60 00 - Product Requirements.

7. Mold-Resistant, Paper-Faced Products:

a. CertainTeed Corporation; M2Tech 5/8" Type X Moisture & Mold Resistant Drywall: www.certainteed.com/#sle.

b. Georgia-Pacific Gypsum; ToughRock Mold-Guard: www.gpgypsum.com/#sle.

c. Georgia-Pacific Gypsum; ToughRock Fireguard X Mold-Guard: www.gpgypsum.com/#sle.

d. Gold Bond Building Products, LLC provided by National Gypsum Company; Gold Bond XP Gypsum Board: www.goldbondbuilding.com/#sle.

e. Gold Bond Building Products, LLC provided by National Gypsum Company; Gold Bond XP Fire-Shield Gypsum Board: www.goldbondbuilding.com/#sle.

f. USG Corporation; Sheetrock Brand EcoSmart Panels Mold Tough Firecode X 5/8 in. (15.9 mm): www.usg.com/#sle.

g. USG Corporation; Sheetrock Brand Mold Tough Firecode SCX Panels 5/8 in. (15.9 mm): www.usg.com/#sle.

h. Substitutions: See Section 01 60 00 - Product Requirements.

8. Glass Mat Faced Products:

a. CertainTeed Corporation; 5/8" GlasRoc Interior Type X: www.certainteed.com/#sle.

b. Georgia-Pacific Gypsum; DensArmor Plus: www.gpgypsum.com/#sle.

c. Gold Bond Building Products, LLC provided by National Gypsum Company; Gold Bond eXP Interior Extreme Fire-Shield Gypsum Panel: www.goldbondbuilding.com/#sle.

d. USG Corporation; Sheetrock Brand Glass-Mat Panels Mold Tough Regular 5/8 in. (15.9 mm): www.usg.com/#sle.

e. Substitutions: See Section 01 60 00 - Product Requirements.

D. Abuse Resistant Wallboard:

1. Application: High-traffic areas indicated.

a. Provide up to 96 inches, minimum.

2. Surface Abrasion: Level 1, minimum, when tested in accordance with ASTM C1629/C1629M.
3. Indentation: Level 1, minimum, when tested in accordance with ASTM C1629/C1629M.
4. Soft Body Impact: Level 1, minimum, when tested in accordance with ASTM C1629/C1629M.
5. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
6. Paper-Faced Type: Gypsum wallboard, as defined in ASTM C1396/C1396M.
7. Type: Fire-resistance-rated Type X, UL or WH listed.
8. Thickness: 5/8 inch.
9. Edges: Tapered.
10. Paper-Faced Products:
    a. Georgia-Pacific Gypsum; ToughRock Fireguard X Mold Guard Abuse-Resistant: www.gpgypsum.com/#sle.
    b. Gold Bond Building Products, LLC provided by National Gypsum Company; Gold Bond XP Hi-Abuse Gypsum Board: www.goldbondbuilding.com/#sle.
    c. USG Corporation; Sheetrock Brand AR Firecode X Panels 5/8 in.. (15.9 mm): www.usg.com/#sle.
    d. USG Corporation; Sheetrock Brand Mold Tough AR Firecode X 5/8 in. (15.9 mm): www.usg.com/#sle.
    e. Substitutions: See Section 01 60 00 - Product Requirements.
11. Glass Mat Faced Products:
    a. Gold Bond Building Products, LLC provided by National Gypsum Company; Gold Bond eXP Interior Extreme AR Gypsum Panel: www.goldbondbuilding.com/#sle.
    b. USG Corporation; Sheetrock Brand Glass-Mat Panels Mold Tough AR Firecode X 5/8 in. (15.9 mm): www.usg.com/#sle.
    c. Substitutions: See Section 01 60 00 - Product Requirements.

2.03 GYPSUM BOARD ACCESSORIES

A. Acoustic Insulation: ASTM C665; preformed mineral-fiber, friction fit type, unfaced; thickness 2 inches.
1. Application:
    a. Partitions with STC Rating:
        1) Insulation fill at gypsum board partition stud framing.
        2) Surround penetrations in gypsum board partitions.
    b. Gypsum board ceilings adjacent to sound-rated partitions.
2. Surface Burning Characteristics as per ASTM E84: Flame Spread of 10; Smoke Developed of 10.
3. Products:
    a. Owens-Corning; Sound Attenuation Batts: www.owenscorning.com.

b. CertainTeed; "NoiseReducer" Sound Attenuation Batts: www.certainteed.com.

c. Substitutions: See Section 01 60 00 - Product Requirements.

B. Acoustic Sealant: Acrylic emulsion latex or water-based elastomeric sealant; do not use solvent-based non-curing butyl sealant.

1. Non-staining, gunnable, synthetic-rubber sealant recommended for sealing interior concealed joints to reduce airborne sound transmission.

2. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following acoustical sealants for concealed joints:

3. Products:

a. Franklin International, Inc; Titebond Acoustical Smoke & Sound Sealant: www.titebond.com/#sle.

b. Liquid Nails, a brand of PPG Architectural Coatings: www.liquidnails.com/#sle.

c. Ohio Sealants, Inc.; Pro-Series SC-170 Rubber Base Sound Sealant.

d. Pecora Corp.; BA-98.

e. Specified Technologies Inc; Smoke N Sound Acoustical Sealant: www.stifirestop.com/#sle.

f. Tremco, Inc.; Tremco Acoustical Sealant.

g. USG Corporation; USG Sheetrock Acoustical Sealant

h. Substitutions: See Section 01 60 00 - Product Requirements.

C. Beads, Joint Accessories, and Other Trim: ASTM C1047, galvanized steel, unless noted otherwise.

1. Corner Beads: Low profile, for 90 degree outside corners.

a. Products:

1) Cornerbead: USG Sheetrock B1 XW EL, or equal.

2) L Trim: USG Paper-faced "L" trim, B4 or equal.

3) Substitutions: See Section 01 60 00 - Product Requirements.

2. Expansion Joints:

a. Fire-Resistance Rated: 1 hour when joint system tested in accordance with UL 2079.

b. Type: V-shaped metal with factory-installed protective tape.

c. Products:

1) Phillips Manufacturing Co; 093 Expansion Control Joint: www.phillipsmfg.com/#sle.

2) Trim-Tex, Inc; Fire Rated 093V Expansion Bead: www.trim-tex.com/#sle.

3) Substitutions: See Section 01 60 00 - Product Requirements.

D. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.

1. Fiberglass Tape: 2 inch wide, coated glass fiber tape for joints and corners, except as otherwise indicated.
2. Joint Compound: Setting type, field-mixed.

E. High Build Drywall Surfacer: Vinyl acrylic latex-based coating for spray application, designed to take the place of skim coating and separate paint primer in achieving Level 5 finish.
1. Products:
a. CertainTeed Corporation; Level V Wall and Ceiling Primer/Surfacer with M2Tech: www.certainteed.com/#sle.
b. USG Corporation; USG Sheetrock Brand Tuff-Hide Primer-Surfacer: www.usg.com/#sle.
c. Substitutions: See Section 01 60 00 - Product Requirements.

F. Abuse Resistant Finishes:
1. Acrylic, water-based, non-textured, high build, tintable primer and surfacer.

G. Nails for Attachment to Wood Members: ASTM C514.

H. Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.

I. Adhesive for Attachment to Metal:
1. Do not use adhesive containing benzene, carbon tetrachloride, or trichloroethylene.
a. Adhesive shall contain a maximum VOC content of 50 grams per liter.
b. Adhesive must meet the requirements of low emitting materials credit.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that project conditions are appropriate for work of this section to commence.

B. Beginning of installation means acceptance of substrate.

C. Maintain a minimum temperature of 50 degrees F for a period extending from 48 hours before installation until the joint compounds have completely dried.

D. Provide adequate and continuous ventilation to ensure proper drying, setting or curing of taping and finishing compunds. Provide temporary air circulators in enclosed areas lacking natural ventilation. GA-216, article 18.2.

E. Verify that framing and furring are securely attached and of sizes and spacing to provide a suitable substrate to receive gypsum board.

F. Examine substrates which gypsum board wall construction attaches to or abuts, including the following.
1. Preset hollow metal frames
2. Piping.
3. Conduit.
4. Ductwork.

G. Provide fixtures, anchors, sleeves, inserts and miscellaneous items, and provide openings and chases as necessary. Prior to closing in and finishing of drywall Work, ascertain that piping, conduit, ductwork and fixtures which are to be concealed and which penetrate gypsum boards are in place, tested and approved.

H. Scaffolding: Construct, erect and maintain in conformance with applicable laws and ordinances.

I. Fire Protection: Where required, the Work shall comply with the requirements for the protection rating indicated in the governing building code.

3.02 ACOUSTIC ACCESSORIES INSTALLATION

A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.

B. Sound Isolation Tape: Apply to vertical studs and top and bottom tracks/runners in accordance with manufacturer's instructions.

1. Acoustic Tape: Place on top of all partition walls that do not project above suspended ceiling assemblies. Adhesive side shall be place on top of the wall.

C. Acoustic Sealant: Install in accordance with manufacturer's instructions.

1. Place one bead continuously on substrate before installation of perimeter framing members.
2. Place continuous bead at perimeter of each layer of gypsum board.
3. Seal around all penetrations by conduit, pipe, ducts, and rough-in boxes, except where firestopping is provided.

3.03 BOARD INSTALLATION

A. Regulatory Requirements: Install gypsum board products in accordance with applicable Code requirements and requirements of listed assemblies shown on Drawings.

B. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.

C. Single-Layer Nonrated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.

1. Exception: Tapered edges to receive joint treatment at right angles to framing.

D. Double-Layer, Nonrated: Use gypsum board for first layer, placed parallel to framing or furring members, with ends and edges occurring over firm bearing. Use glass mat faced gypsum board at exterior walls and at other locations as indicated. Place second layer perpendicular to framing or furring members. Offset joints of second layer from joints of first layer.

E. Fire-Resistance-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.

F. Exposed Gypsum Board in Interior Wet Areas: Seal joints, cut edges, and holes with water-resistant sealant.

G. Installation on Metal Framing: Use screws for attachment of gypsum board except face layer of nonrated double-layer assemblies, which may be installed by means of adhesive lamination.

1. Fastener Spacing: Space fasteners in accordance with reference standards and fire rating requirements of wall, partition, floor and ceiling assembly. Maximum spacing of 1-inch screws 8 inches on centers at vertical edges and 12 inches on centers in field and at top and bottom.
2. At locations with edge lighting and sheet metal backing for accessories, provide continuous furring strips of the same thickness as the backing to create a level and visually smooth condition.

3.04 INSTALLATION OF TRIM AND ACCESSORIES

A. Control Joints: Place control joints consistent with lines of building spaces and as indicated on drawings.
   1. Not more than 30 feet apart on walls and ceilings over 50 feet long.
B. Corner Beads: Install at external corners, using longest practical lengths.
C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.

3.05 JOINT TREATMENT

A. Glass Mat Faced Gypsum Board and Exterior Glass Mat Faced Sheathing: Use fiberglass joint tape, embed and finish with setting type joint compound.
B. Paper Faced Gypsum Board: Use paper joint tape, embed with drying type joint compound and finish with drying type joint compound.
C. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
   1. Level 5: Walls and ceilings to receive semi-gloss or gloss paint finish and other areas specifically indicated. Smooth.
      a. Hard lid Drywall Ceilings (typical).
      b. All Locations where art murals are indicated.
      c. Tape, fill, and sand all exposed joints, edges, and corners with joint and topping compounds using 3-coat method, to produce smooth surfaces ready to receive finishes.
         1) Fill and sand depressions similar to joints except omit tape.
         2) Finish internal corners similar to joints, using folded tape reinforcement.
         3) Complete system with thin skim coat of joint compound over entire gypsum board surface.
         4) Lightly sand to provide a smooth, even surface.
      d. Skim coat required for Level 5. A thin skim coat of joint compound shall be applied to the entire surface. The surface shall be smooth and free of tool marks and ridges.
      e. After the skim coat has dried, provide one uniform coat of drywall primer over the entire surface.
   2. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated. Smooth.

a. At joints and angles, embed tape in joint compound and apply three separate coats of joint compound over joints, angles, fastener heads, and flanges of trim accessories.
    1) Panel surfaces and joint compound must be smooth and free of tool marks and ridges.
b. Provide one uniform coat of drywall primer over the entire surface.

3. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.
    a. Back-of-House Areas (not normally occupied).
    b. At joints and angles, embed tape in joint compound and apply one separate coat of joint compound over tape, fastener heads, and flanges of trim accessories.
        1) Joint compound applied on the face of the tape when the tape is embedded is considered a separate coat.
        2) Panel surfaces must be free of excess joint compound, but tool marks and ridges are acceptable.
4. Level 1: Wall areas above finished ceilings, whether or not accessible in the completed construction.
    a. Including locations specifically noted for fire taping:
        1) Tape and fill all exposed joints, edges and corners with joint compound using two coat method, to produce level and neat finish.
        2) Sanding is not required, except where not sufficiently level for applied construction.
        3) Add coat of joint compound at sanded joints.
        4) Feather coats onto adjoining surfaces so that camber is maximum 1/16-inch.

D. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
    1. Feather coats of joint compound so that camber is maximum 1/32 inch.
    2. Set tape set over joint and seated into joint compound, leaving sufficient adhesive under tape to provide proper bond.
    3. Reinforce internal angles, both horizontal and vertical, and with tape folded to form straight and true angle.
    4. Cement metal external corners in place.
    5. Allow joints to dry according to Gypsum Association Standards based on temperature and humidity. Allow for at least 24 hours between each application of joint compound.
    6. The final application of compound and sanding shall leave all surfaces uniformly smooth and in condition to receive specified finish.
    7. Taping, filling, and sanding are not required at surfaces behind adhesive applied ceramic tile and fixed cabinetry.
    8. Taping, filling, and sanding are not required at base layer of double-layer applications.
E. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.

F. Fill and finish joints and corners of cementitious backing board as recommended by manufacturer.

3.06 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

3.07 REPAIR

A. Repair damage to galvanized coatings in conformance with ASTM A780/A780M.

B. Repair fastener pops by driving a new fastener approximately 1-1/2 inches from the fastener pop and reset the popped fastener. When face paper is punctured, install a new fastener approximately 1-1/2 inches from the defective fastener. Fill damaged surfaces with compound.

3.08 CLEANING

A. See Section 01 70 00 - Execution and Closeout Requirements for additional requirements.

B. Clean upon completion of the work, remove from adjacent surfaces, overspray, splatter and daubs of taping and finish compound and textured finishes..

C. Remove tools, equipment, unused material and cuttings and leave the work in a clean orderly manner.

3.09 PROTECTION

A. Protect installed gypsum board assemblies from subsequent construction operations.

END OF SECTION

SECTION 09 22 36
LATH

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Metal lath for cement plaster.

1.02 RELATED REQUIREMENTS

A. Section 08 31 00 - Access Doors and Panels.

1.03 REFERENCE STANDARDS

A. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength.

B. ASTM A641/A641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.

C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

D. ASTM C841 - Standard Specification for Installation of Interior Lathing and Furring.

E. ASTM C847 - Standard Specification for Metal Lath.

F. ASTM C933 - Standard Specification for Welded Wire Lath.

G. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.

H. ASTM C1032 - Standard Specification for Woven Wire Plaster Base.

I. ASTM C1063 - Standard Specification for Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-Based Plaster.

J. ASTM C1861 - Standard Specification for Lathing and Furring Accessories, and Fasteners, for Interior and Exterior Portland Cement-Based Plaster.

K. ASTM F1667/F1667M - Standard Specification for Driven Fasteners: Nails, Spikes, and Staples.

L. ICC-ES AC70 - Acceptance Criteria for Power-Actuated Fasteners Driven into Concrete, Steel and Masonry Elements.

M. TSIB (PAM) - Plaster Assemblies Manual, Technical Services Information Bureau.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on furring and lathing components, structural characteristics, material limitations, and finish.

1.05 QUALITY ASSURANCE

A. Maintain one copy of each installation standard referenced on site throughout the duration of lathing and plastering work.

B. Installer Qualifications: Company specializing in performing the work of this section with at least three years of documented experience.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Metal Lath and Accessories:

1. Brand X Metals: www.brandxmetals.com.
2. CEMCO: www.cemcosteel.com/#sle.
3. Stockton Products: www.stocktonproducts.com.
4. Structa Wire, a ClarkDietrich Company; Structa Mega Lath: www.clarkdietrich.com/#sle.
5. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 FRAMING AND LATH ASSEMBLIES

A. Provide completed assemblies with the following characteristics:

1. Maximum Deflection of Vertical Assemblies: 1:360 under lateral point load of 100 lbs.
2. Maximum Deflection of Horizontal Assemblies: 1:240 deflection under dead loads and wind uplift.

2.03 LATH

A. Diamond Mesh Metal Lath: ASTM C847, galvanized; self-furring.

1. Weight: To suit application and as specified in ASTM C841 or ASTM C1063 for framing spacing.
2. Weight: 3.4 lb/sq yd.

B. Ribbed Metal Lath: ASTM C847, galvanized; 3/8 inch thick. For soffit use only.

1. Weight: To suit application and as specified in ASTM C841 or ASTM C1063 for framing spacing.
2. Weight: 3.4 lb/sq yd.

C. Welded Wire Lath: Comply with ASTM C933.

1. Basis of Design: Structa Wire, **Structa Mega Lath,** or equal.
2. Description: Prefabricated wire grid composed of two assemblies perpendicular to each other welded together; each assembly consists of uniformly placed, parallel wires welded together.
3. Applications:
   a. Exterior: Used as base to receive cement plaster.
4. Material: ASTM A641/A641M, carbon steel wire, zinc-coated, galvanized; Class 1.
5. Weight: 1.95 lb/sq yd.
6. Opening Size: 1 by 1-1/2 inches.
7. Self-Furring Crimps: 1/4-inch minimum projection, from back of lath plane.

D. Corner Mesh: ASTM C1063; formed sheet steel, minimum 26 gauge, 0.0179 inch, perforated flanges shaped to permit complete embedding in plaster, minimum 2-inch size; G60 galvanized coating in accordance with ASTM A653/A653M.

E. Strip Mesh: Expanded metal lath, same weight as lath, 2 inch wide by 24 inch long; same finish as lath.

F. Finishing Accessories: ASTM C1063 (Cement Plaster); extruded aluminum alloy (6063 T5) or galvanized steel sheet ASTM A924/A924M G90, unless noted otherwise.

1. Types: As detailed or required for finished appearance.
2. Special Shapes: In addition to conventional corner bead and control joints, provide U-bead at exposed plaster edges.
3. Products:
    a. Same manufacturer as framing materials.
    b. Fry Reglet; Trim and Reveal Systems: www.fryreglet.com.
    c. Pittcon Industries: www.pittconindustries.com.
    d. Stockton Products; Extruded Aluminum: www.stocktonproducts.com/#sle.
    e. Substitutions: See Section 01 60 00 - Product Requirements.

G. Beads, Screeds, Joint Accessories, and Other Trim: Depth governed by plaster thickness, and maximum possible lengths.

1. Types specified below conforming to TSIB (PAM).
2. Material: Formed galvanized sheet steel, expanded metal flanges.
3. Casing Beads with Weep Holes: Square edges.
    a. Fabricated of 26 gauge, 0.0217 inch hot-dip galvanized steel and bonderized. Provide beads with expanded metal flange and inverted vee at plaster edge of face flange.
    b. Provide weep holes only where indicated on drawings and in weeping conditions.
    c. Products:
        1) CEMCO: #66 Expanded Flange Casing Bead: www.cemcosteel.com/#sle.
        2) Phillips Manufacturing Co; #66 Expanded Flange Square Casing Bead: www.phillipsmfg.com/#sle.
        3) Substitutions: See Section 01 60 00 - Product Requirements.
4. Corner Beads: Square Edge corners.
    a. Products:
        1) CEMCO; No. 2-A Corner Bead and ; No. 2-A Reinforced Flange Corner Bead: www.cemcosteel.com/#sle.
        2) Phillips Manufacturing Co; #1 Expanded Corner Bead: www.phillipsmfg.com/#sle.
        3) Stockton Products: www.stocktonproducts.com/#sle.
        4) Substitutions: See Section 01 60 00 - Product Requirements.

b. Corner Reinforcement: Fabricated from from welded or woven copper bearing steel wire of minimum 28 gage, hot-dip galvanized, minimum 3 inches wide.
    1) Products:
        (a) CEMCO; Cemcorner: www.cemcosteel.com/#sle.
        (b) Stockton Products: www.stocktonproducts.com/#sle.
        (c) Substitutions: See Section 01 60 00 - Product Requirements.

c. Corner Reinforcement: Fabricated from expanded metal with large openings, from welded or woven copper bearing steel wire of minimum 28 gage, hot-dip galvanized, minimum 3 inches wide.
    1) Cornerite: Expanded Metal, weighing 0.105 pounds per lineal foot, bent in center to form 105 degree angle, 6 inches wide (total).
        (a) Product: Cornerite manufactured by Cemco.

5. Expansion Joints: Accordion profile with factory-installed protective tape, 2 inch wide flanges.
    a. Products:
        1) Basis of Design Product: Double "J" Control Joint (#XJ-15) manufactured by CEMCO.
        2) Basis of Design Product at Horizontal Conditions: M-Slide Expansion Joint manufactured by CEMCO.
        3) CEMCO; Corner Expansion Joint (#30): www.cemcosteel.com/#sle.
        4) Phillips Manufacturing Co; #15 Double V Expansion Joint: www.phillipsmfg.com/#sle.
        5) Stockton Products: www.stocktonproducts.com/#sle.
        6) Substitutions: See Section 01 60 00 - Product Requirements.
6. Base Screeds:
    a. Material: Galvanized steel, ASTM A653/A653M, with G90 zinc coating; minimum 26-gauge, 0.0179-inch thick base steel.
        1) Foundation Weep Screeds: Perforated type.
    b. Products:
        1) Basis of Design Product: NFD: #5 Drip, with weep holes manufactured by Stockton Products.
        2) Basis of Design Product: No. 7 Extended Foundation Screed manufactured by CEMCO. For locations where plaster is just above a paving surface.
        3) Stockton Products: www.stocktonproducts.com/#sle.
        4) Substitutions: See Section 01 60 00 - Product Requirements.
7. Drip Screeds: Fabricated from 0.018 inch thick; G-90 hot-dip galvanized steel.
    a. Product: NFD: #5 Drip manufactured by Stockton Products.
    b. Product: #6 Head Drip Screed manufactured by CEMCO. For locations above other flashing such as door and window heads.

8. Window/Door Drips: Self weeping 26 gage hot-dip galvanized steel.
    a. Product: No. 3 Flashing Screed manufactured by CEMCO. For locations where plaster is offset 1-1/2 inches back from projection.
9. Strip Lath: Strip Reinforcement (Expanded Metal), weighing 2.5 lbs/sq.yd., 6 inches wide. Use hot-dip galvanized at all locations where galvanized metal lath occurs.
10. Control Joints: Accordion profile with factory-installed protective tape, 2 inch flanges.
    a. Product: Double "V" Control Joint (#15) manufactured by CEMCO.
    b. Stress Relief Joints (Expansion and Control Joints): Stress Relief Control Joints, fabricated of 26 gage (0.0217 inch) hot-dip galvanized steel with G60 hot-dip galvanized coating.
        1) Recesses on control joints shall be covered with removable tape or filled with rope to prevent plaster from filling the recess.

2.04 FURRING ACCESSORIES

A. Strap Hangers: Comply with ASTM C1861.
1. Description: Flat steel straps fabricated for through-bolt attachments.
2. Applications:
    a. Exterior soffits; used to suspend plaster assemblies from structure above.
3. Thickness: As indicated on drawings.
4. Width: As indicated on drawings.
5. Length: As indicated on drawings.
6. Mounting: As indicated on drawings.
7. Material and Finish: Low carbon steel; galvanized.

B. Threaded Rod Hangers: Comply with ASTM C1861.
1. Description: Steel hanger rods.
2. Applications:
    a. Exterior soffits; used to suspend plaster assemblies from structure above.
3. Mounting: As indicated on drawings.
4. Diameter: As indicated on drawings.
5. Length: As indicated on drawings.
6. Material: Carbon steel; ASTM A307, Grade A.
7. Finish: Provide galvanized, zinc-electroplated, or rust-inhibiting paint finish.

C. U-Channel Furring: Comply with ASTM C1861.
1. Description: U-shaped, cold-formed furring units.
2. Applications:
    a. Exterior soffits; used as furring accessories in suspended plaster assemblies.
3. Web Depth: As indicated on drawings.
4. Flange Dimension: As indicated on drawings.

5. Material: Steel sheet, galvanized or galvannealed; comply with ASTM A653/A653M.
6. Minimum Base Steel Thickness: 16 gauge, 0.0538 inch.
7. Minimum Yield Strength: 50 ksi.
8. Protective Coating for Exterior Applications:
    a. Zinc Coating Thickness: G90.

D. Tie Wire: Comply with ASTM C1861.
1. Applications:
    a. Exterior applications; used for attaching lathing and furring accessories.
2. Carbon Steel Wire: ASTM A641/A641M; annealed, Class 1, zinc-coated galvanized.
    a. Wire Diameter: 18 gauge, 0.0475 inch uncoated.

E. Hanger Wire: Comply with ASTM C1861.
1. Applications: Interior ceilings; used for hanging lath and plaster ceiling assemblies.
2. Carbon Steel Wire: ASTM A641/A641M; annealed, Class 1, zinc-coated galvanized.
    a. Wire Diameter: 8 gauge, 0.1620 inch, uncoated.

2.05 ACCESSORIES

A. Nails and Staples: Comply with ASTM C1861 and ASTM F1667/F1667M.
1. Applications: Fastening into wood studs and wood joists.
2. Comply with ASTM C1861 for nail type and embedment depth.

B. Screws: Comply with ASTM C1861 and:
1. ASTM C1002 for fastening metal plaster bases to wood studs.

C. Power-Actuated Fasteners: Provide fasteners meeting requirements of ICC-ES AC70.
1. Applications: Fastening furring accessories into solid bases.
2. Comply with ASTM C1861 for fastener type and embedment depth.

D. Fastener Materials:

E. Fasteners in Contact with Preservative-Treated and Fire-Retardant-Treated Wood.
1. Comply with requirements of applicable code for corrosion resistance.

F. Construction Adhesives:
1. ASTM C1861, gunnable, for exterior applications; compatible with substrates.

2.06 ACCESS PANELS

A. Access Panels: See Section 08 31 00.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that substrates are ready to receive work and conditions are suitable for application.

C. Do not begin until unacceptable conditions have been corrected.

D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 INSTALLATION - GENERAL

A. Install interior lath and furring for gypsum plaster in accordance with ASTM C841.

B. Install lathing and furring for exterior and interior cement plaster in accordance with ASTM C1063 and manufacturer's evaluation report for alternative installation requirements.

C. Install lath and furring for fire-rated assemblies in accordance with requirements of assembly as indicated.

3.03 CEILING AND SOFFIT FRAMING INSTALLATION

A. Install furring after work above ceiling or soffit is complete. Coordinate the location of hangers with other work.

B. Install furring independent of walls, columns, and above-ceiling work.

C. Securely anchor hangers to structural members or embed in structural slab. Space hangers as required to limit deflection to criteria indicated. Use rigid hangers at exterior soffits.

D. Space main carrying channels at maximum 72 inch on center, and not more than 6 inches from wall surfaces. Lap splice securely.

E. Securely fix carrying channels to hangers to prevent turning or twisting and to transmit full load to hangers.

F. Install furring channels perpendicular to carrying channels, not more than 2 inches from perimeter walls, and rigidly secure. Lap splices securely.

G. Reinforce openings in suspension system that interrupt main carrying channels or furring channels with lateral channel bracing. Extend bracing minimum 24 inches past each opening.

H. Laterally brace suspension system.

3.04 CONTROL AND EXPANSION JOINT INSTALLATION

A. At unsheathed open framing, provide double stud construction behind control joint.

B. Locate joints as indicated on drawings and comply with ASTM C1063.

1. Area of plaster panel not to exceed 144 sq ft for vertical surfaces.
    a. Expansion Joint Spacing: 36 feet maximum on center and as indicated on drawings.
2. Area of plaster panel not to exceed 100 sq ft for horizontal, curved or angled surfaces.
3. Spacing between control joints not to exceed 18 ft in each direction.
    a. Narrow panels should not exceed 12 feet in length.
4. Area bounded by control joints not to exceed a length-to-width ratio of 2-1/2 to 1.
5. Vertical control joints should pass through horizontal control joints. Vertical control joints must terminate at horizontal expansion joints.
6. Joint Placement: Approved by Architect before plastering.

C. Install expansion joints where an expansion joint occurs in base exterior wall.

D. Install prefabricated joint accessories in accordance with ASTM C1063.
    1. Install factory-made joints at reveal-to-reveal and reveal-to-control joint intersections.
E. Discontinue metal lath at joint and apply 12 inch wide strip of flexible flashing behind each joint
F. Install factory-made joints at reveal-to-reveal and reveal-to-control joint intersections.
G. Discontinue metal lath at joint and apply 12 inch wide strip of flexible flashing behind each joint

3.05 ACCESS PANELS INSTALLATION

A. Install access panels and rigidly secure in place.
B. Install frames plumb and level in opening. Secure rigidly in place.
C. Position to provide convenient access to concealed work requiring access.

3.06 LATH INSTALLATION

A. Apply lath taut, with long dimension perpendicular to supports.
B. Lap or nest ends of metal lath in accordance with ASTM C841.
C. Secure end laps with tie wire where they occur between supports.
D. Do not continue lath through control or expansion joints.
E. Apply ribbed lath with self-furring ribs perpendicular to supports at soffits and horizontal surfaces.
    1. Lap sides of ribbed lath minimum 1-1/2 inches.
    2. Nest outside ribs of rib lath together.
    3. Attach lath to supports using specified screws at maximum 6 inches on center vertical and 16 inches on center horizontal.
    4. At horizontal metal lath application, secure lath to each support with specified screws.
F. Expanded metal lath at vertical supports, apply self-furring “grooved” metal lath with self-furring rib perpendicular to supports.
    1. Install per Table 2507.2 California Building Code.
    2. Maintain lath 1/4 inch away from vertical supports.
    3. At concrete or masonry, install with drill and drive fasteners, power or powder actuated fasteners in accordance with manufacturer's recommendations and ASTM C1063.
G. Attach lath to wood supports using nails at maximum 12 inches on center.
H. Attach metal lath to metal supports using tie wire at maximum 6 inches on center.
I. Continuously reinforce internal angles with corner mesh, except where the metal lath returns 3 inches from corner to form the angle reinforcement; fasten at perimeter edges only.
J. Place corner bead at external wall corners; fasten at outer edges of lath only.
K. Place base screeds at termination of plaster areas; secure rigidly in place.
    1. Install weep screeds at foundation. Install minimum 4 inches above earth or 2 inches above paved areas.

2. To allow moisture to escape from a portland cement plaster (stucco) assembly, no sealant shall be placed at the bottom of the plaster termination.

L. Place 4 inch wide strips of lath centered over junctions of dissimilar backing materials, and secure rigidly in place.

M. Place lath vertically above each top corner and each side of door frames to 6 inches above ceiling line.

N. Place casing beads at terminations of plaster finish. Butt and align ends. Secure rigidly in place.

O. Place additional strip mesh diagonally at corners of lathed openings. Secure rigidly in place.

3.07 FIELD QUALITY CONTROL

A. Inspection: Notify Architect minimum 2 days prior to scratch coat for inspection of all in-place lath and accessories.

3.08 TOLERANCES

A. Install accessories to lines and levels.

B. Maximum Variation from True Lines and Levels: 1/8 inch in 10 feet.

C. Maximum Variation from True Position: 1/8 inch.

END OF SECTION

SECTION 09 24 00
CEMENT PLASTERING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Cement plastering.

1.02 RELATED REQUIREMENTS

A. Section 09 21 16 - Gypsum Board Assemblies: Gypsum Sheathing: Solid backing at all exterior plaster.

B. Section 09 22 36 - Lath: Lath, furring, beads, screeds, and joint accessories for plaster base.

C. Section 09 91 13 - Exterior Painting: Finish paint over integral color plaster.

1.03 REFERENCE STANDARDS

A. ASTM C150/C150M - Standard Specification for Portland Cement.

B. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes.

C. ASTM C926 - Standard Specification for Application of Portland Cement-Based Plaster.

D. ASTM C932 - Standard Specification for Surface-Applied Bonding Compounds for Exterior Plastering.

E. TSIB (PAM) - Plaster Assemblies Manual, Technical Services Information Bureau.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittals procedures.

B. Product Data: Provide data on plaster materials and trim accessories.

C. Samples:

1. Submit two samples, 8 by 8 inch in size illustrating finish color and texture.
2. Submit two samples of each type trim accessory.

D. Evaluation Service Reports: Show compliance with specified requirements.

E. Installer's Qualification Statement.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.

B. Copies of Documents at Project Site: Maintain at the project site a copy of each referenced document that prescribes execution requirements.

1.06 MOCK-UPS

A. See Section 01 40 00 - Quality Requirements for additional requirements.

B. Mock-Up Panel: Construct a 4 foot wide by 8 foot high sample panel of plaster work at the jobsite demonstrating installation procedures, finish texture, and color. Show each phase of installation including framing and reinforcement.

C. After color and texture samples have been approved and returned, construct a mock-up not less than as noted above in size, of each texture type, in location approved by Architect.

1. Use workmen, equipment and techniques proposed for use on the project.
2. The panel may be constructed as a portion of the finished work, provided the approved panel is clearly identified for future reference.
3. The approved panel shall become the standard of comparison for cement plaster work for the project.
4. If mock-up is not a part of building construction, it must be removed when directed by Architect after completion of project.

1.07 FIELD CONDITIONS

A. Exterior Plaster Work: Do not apply plaster when substrate or ambient air temperature is 40 degrees F or lower, or when temperature is expected to drop below 40 degrees F within 48 hours of application.

PART 2 PRODUCTS

2.01 CEMENT PLASTER APPLICATIONS

A. Lath Plaster Base: Metal lath.

1. Plaster Type: Factory prepared plaster mix.
2. Number of Coats: Three.
3. First Coat: Apply to a nominal thickness of 3/8 inch.
4. Second Coat: Apply to a nominal thickness of 3/8 inch.
5. Leveling Coat: Apply to a nominal thickness of 1/32 to 1/16 inch.
6. Finish: Acrylic.

2.02 FACTORY PREPARED CEMENT PLASTER

A. Exterior Portland cement plaster system made of scratch and brown base coat, leveling coat with reinforcing mesh, and acrylic finish coat; install in accordance with ASTM C926.

1. Provide continuous exterior insulation, with drainage grooves, as part of the system, by the same manufacturer.
   a. See Technical Bulletin 60.110, TSIB (PAM).
2. Provide weather resistive barrier as part of the system.
3. Manufacturer - Basis of Design:
   a. Omega Products International, Inc.; Super Cement with Crack Isolation System: omega-products.com.
4. Other Acceptable Manufacturers:

a. LaHabra; FastWall 300: www.lahabrastucco.com/#sle.

b. Omega Products International; Super Cement: www.omega-products.com/#sle.

c. Omega Products International, Inc.; Super Cement with Crack Isolation System: omega-products.com.

d. Sika Corporation; Parex Armourwall 300: www.parex.com/#sle.

e. Sto Corp; Sto Powerwall: www.stocorp.com/#sle.

f. Substitutions: See Section 01 60 00 - Product Requirements.

B. Premixed One-Coat Base: Mixture of Type I Portland cement complying with ASTM C150/C150M, hydrated lime complying with ASTM C207, fibers and other approved ingredients; install in accordance with ASTM C926.

1. Manufacturers:

a. Omega Products International, Inc.; Diamond Wall Insulating One Coat System: omega-products.com.

b. Substitutions: See Section 01 60 00 - Product Requirements.

C. Premixed Base Coats: Mixture of cement, aggregate, fibers, and proprietary admixtures for scratch and brown coats; install in accordance with ASTM C926.

D. Premixed Leveling Coat: Acrylic polymer-based blend approved for use with plaster manufacturer's base coat and finish materials.

E. Painted Finish Coating: See Section 09 91 13.

F. Primer: Acrylic, as recommended by coating manufacturer and compatible with plaster base coat.

G. Premixed Textured Coating: Polymer modified acrylic coating, integrally colored, and trowel applied to substrates prepared in accordance with manufacturer's written installation instructions.

1. Color: As indicated on drawings.

2.03 ACCESSORIES

A. Lath: See Section 09 22 36.

B. Finishing Accessories: See Section 09 22 36.

C. Bonding Compound: Provide type recommended for bonding plaster to solid surfaces, complying with ASTM C932.

D. Reinforcing Mesh: 4.5 oz/sq yd alkali-resistant mesh.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions are acceptable prior to starting this work.

B. Verify lath is flat, secured to substrate, and joint and surface perimeter accessories are properly in place.

C. Verify mechanical and electrical equipment and services located within areas to receive this work have been properly tested and approved.

3.02 PREPARATION

A. Roughen smooth concrete surfaces and apply bonding compound in accordance with manufacturer's written installation instructions.

3.03 INSTALLATION

3.04 MIXING

A. Mix only as much plaster as can be used prior to initial set.

B. Mix materials dry, to uniform color and consistency, before adding water.

C. Protect mixtures from frost or freezing temperatures, contamination, and excessive evaporation.

3.05 APPLICATION

A. Apply plaster in accordance with manufacturer's written instructions and comply with ASTM C926.

B. Base Coats:

1. Apply base coat(s) to fully embed lath and to specified thickness.
2. Follow guidelines in ASTM C926 and manufacturer's written installation instructions for moist curing base coats and application of subsequent coats.

C. Leveling Coat:

1. Apply leveling coat to specified thickness.
2. Fully embed reinforcing mesh in leveling coat.

D. Finish Coats:

1. Cement Plaster:
   a. Apply with sufficient material and pressure to ensure complete coverage of base to specified thickness.
   b. Apply desired surface texture while mix is still workable.
   c. Float to a consistent finish.
2. Primer and Acrylic Coatings:
   a. Remove surface contaminants such as dust and dirt without damaging substrate.
   b. Apply primer in accordance with manufacturer's instructions.
   c. Apply finish coating in number of coats and to thickness recommended by manufacturer.
3. Acrylic Finish Texture: Apply to a consistent finish.
   a. TSIB (PAM) Fine Sand.

E. Finish Painting Overcoat: See Section 09 91 13 - Exterior Painting.

3.06 TOLERANCES

A. Maximum Variation from True Flatness: 1/4 inch in 10 feet.

3.07 REPAIR

A. Patching: Remove loose, damaged or defective plaster and replace with plaster of same composition; finish to match surrounding area.

END OF SECTION

SECTION 09 30 00
TILING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Tile for floor applications.

B. Tile for wall applications.

C. Cementitious backer board as tile substrate.

D. Stone thresholds.

E. Ceramic trim.

F. Non-ceramic trim.

1.02 RELATED REQUIREMENTS

A. Section 07 92 00 - Joint Sealants: Sealing joints between tile work and adjacent construction and fixtures.

B. Section 09 05 61 - Common Work Results for Flooring Preparation: Concrete slab moisture and alkalinity testing and remediation procedures.

C. Section 09 21 16 - Gypsum Board Assemblies: Tile backer board.

1.03 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design.

B. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units.

C. ANSI A118.1 - American National Standard Specifications for Dry-Set Cement Mortar.

D. ANSI A118.3 - American National Standard Specifications for Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy and Water Cleanable Tile-Setting Epoxy Adhesive.

E. ANSI A118.4 - American National Standard Specifications for Modified Dry-Set Cement Mortar.

F. ANSI A118.7 - American National Standard Specifications for High Performance Cement Grouts for Tile Installation.

G. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units.

H. ANSI A118.10 - American National Standard Specifications for Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone Installation.

I. ANSI A118.12 - American National Standard Specifications for Crack Isolation Membranes for Thin-Set Ceramic Tile and Dimension Stone Installation.

J. ANSI A118.15 - American National Standard Specifications for Improved Modified Dry-Set Cement Mortar.

K. ANSI A137.1 - American National Standard Specifications for Ceramic Tile.

L. ANSI A326.3 - American National Standard Test Method for Measuring Dynamic Coefficient of Friction of Hard Surface Flooring Materials.

M. ANSI/NFSI B101.3 - Test Method for Measuring Wet DCOF of Common Hard Surface Floor Materials.

N. ASTM C373 - Standard Test Methods for Determination of Water Absorption and Associated Properties by Vacuum Method for Pressed Ceramic Tiles and Glass Tiles and Boil Method for Extruded Ceramic Tiles and Non-tile Fired Ceramic Whiteware Products.

O. ASTM D638 - Standard Test Method for Tensile Properties of Plastics.

P. BAAQMD 8-51 - Bay Area Air Quality Management District Regulation 8, Rule 51, Adhesive and Sealant Products.

Q. SCAQMD 1168 - Adhesive and Sealant Applications.

R. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by affected installers.

1. Discussion topics: dry times, cure times, protection of all steps of tile installation system (membranes, adhesive, grout).

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.

C. Shop Drawings: Indicate tile layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar materials, control and expansion joints, thresholds, and setting details.

D. Samples: Mount tile and apply grout on two plywood panels, minimum 18 by 18 inches in size illustrating pattern, color variations, and grout joint size variations.

E. Certificate: Certify products of this section meet or exceed specified requirements.

F. Master Grade Certificate: Submit for each type of tile, signed by the tile manufacturer and tile installer.

1. Prior to shipment of tile to jobsite, deliver Master Grade Certificates to Architect, complying with TCNA/ANSI A137.1.

G. Installer's qualification statement.

1. Submit documentation of National Tile Contractors Association (NTCA) or Tile Contractors' Association of America (TCAA) accreditation; www.tile-assn.com/#sle

2. Submit documentation of completion of apprenticeship and certification programs.

H. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods.

I. Maintenance Materials: Furnish the following for District's use in maintenance of project.

1. See Section 01 60 00 - Product Requirements, for additional provisions.
2. Extra Tile: One box, minimum of 24 pieces of each size, color, and surface finish combination.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, with minimum five years of documented experience.

B. Installer Qualifications:

1. Company specializing in performing tile installation, with minimum of five years of documented experience.
2. Installer Certification:
   a. Ceramic Tile Education Foundation (CTEF): Certified Tile Installer (CTI).
   b. Apprenticeship Program: Installer has achieved Journeyworker status through an apprenticeship from the International Union of Bricklayers and Allied Craftworkers (IUBAC) or a U.S. Department of Labor (DOL)-recognized program.
   c. Advanced Certifications for Tile Installers (ACT): Certification in the installation of membranes, mortar bed (mud) floors, mortar (mud) walls, large format tile, gauged porcelain tile/panels/slabs, and grouts.

1.07 MOCK-UPS

A. See Section 01 40 00 - Quality Requirements for additional requirements.

B. Construct tile mock-up incorporating components specified for location.

1. Minimum size of mock-up is indicated on drawings.
2. Mock-up may not remain as part of work.

1.08 DELIVERY, STORAGE, AND HANDLING

A. See Section 01 74 19 - Construction Waste Management and Disposal for packaging waste requirements.

B. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.09 FIELD CONDITIONS

A. Do not install solvent-based products in an unventilated environment.

B. Maintain ambient and substrate temperature above 50 degrees F and below 100 degrees F during installation and curing of setting materials.

1.10 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Manufacturer Warranty: Provide 1-year manufacturer warranty for backer board. Complete forms in District's name and register with manufacturer.

PART 2 PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. Floor Tile: Provide tile for flooring applications with minimum wet Dynamic Coefficient of Friction (DCOF) of 0.42 when tested in accordance with ANSI A326.3.

2.02 REGULATORY REQUIREMENTS

A. Regulatory Requirements for Persons with Disabilities: Provide ceramic tile flooring meeting slip-resistant requirements of California Code of Regulations (CCR), Title 24, Part 2, Chapter 11B and ADA Standards, latest amendment.

1. Tile flooring surface shall be stable, firm, and slip resistant. CBC Section 11B-302.1 General.
2. Tile flooring Surface shall demonstrate a dynamic coefficient of friction of at least 0.42 wet per DCOF AcuTest ANSI A137.1 Section 9.6 and ANSI/NFSI B101.3(using a BOT-3000 testing unit) will be accepted as meeting the intent of slip resistance; CBC 11B-302 Floor or Ground Surfaces and ADA Standards.
    a. Ramp surface: Provide wet DCOF value of 0.46.

B. California Plumbing Code:

1. Floor Drains:
    a. Inspection of Work - All surfaces prepared by others shall be inspected by the tile installer before starting tile work and all unsatisfactory conditions reported to the Administrative Authority. Starting tile work by the tile installer shall be considered as acceptance of surfaces prepared by others.
    b. Surfaces - All surfaces to receive tile work shall be clean, structurally sound, and slopes shall to conform to CBC.

    Note: No tile work shall proceed until the pan and drain construction has been inspected and approved by the Administrative Authority, where required.
2. Definition:
    a. Receptor: An approved plumbing fixture or device of such material, shape, and capacity as to adequately receive the discharge from indirect waste pipes, so constructed and located as to be readily cleaned. CPC 220.0

2.03 TILE

A. Glazed Wall Tile: ANSI A137.1 standard grade.

1. Moisture Absorption: 7.0 to 20.0 percent as tested in accordance with ASTM C373.
2. Size: As indicated on Drawings, nominal.
3. Edges: Cushioned.
4. Surface Finish: High gloss.
5. Color: As selected by Architect from manufacturer's standard range.
6. Trim Units: Matching bead, bullnose, cove, and base shapes in sizes coordinated with field tile.

B. Porcelain Tile: ANSI A137.1 standard grade.

1. Moisture Absorption: 0 to 0.5 percent as tested in accordance with ASTM C373.
2. Size: as indicated on Drawings, nominal.
3. Thickness: 3/8 inch.
4. Edges: Interlocking shape.
5. Surface Finish: Unglazed.
    a. Dynamic Wet Slip Resistance DCOF AcuTest: 0.42
6. Color: As selected by Architect from manufacturer's standard range.
7. Trim Units: Matching bullnose, cove base, and cove shapes in sizes coordinated with field tile.

2.04 TRIM AND ACCESSORIES

A. Shower Receptor: See Division 22 - Plumbing.

B. Ceramic Trim: Matching bullnose, double bullnose, cove base, and cove ceramic shapes in sizes coordinated with field tile.

1. Applications:
    a. Open Edges: Bullnose.
    b. Inside Corners: Jointed.
    c. Floor to Wall Joints: Cove base.
2. Manufacturers: Same as for tile.

C. Non-Ceramic Trim: Satin natural anodized extruded aluminum, style and dimensions to suit application, for setting using tile mortar or adhesive.

1. Applications:
    a. Open edges of wall and floor tile.
    b. Transition between floor finishes of different heights.
    c. Thresholds at door openings.
    d. Floor-to-wall joints.
2. Products:
    a. Blanke Corporation; Blanke - Trims and Profiles: www.blankecorp.com/#sle.
        1) Local Representative: Rick Coury, Tile Industry Sales, Inc.; RickTCoury@gmail.com; 714.915.1995.
    b. Genesis APS International: www.genesis-aps.com/#sle.
    c. LATICRETE International, Inc: www.laticrete.com/#sle.
    d. Mapei Corporation: www.mapei.com/#sle.
    e. Schluter-Systems: www.schluter.com/#sle.
    f. Substitutions: See Section 01 60 00 - Product Requirements.

D. Thresholds: 2 inches wide by full width of wall or frame opening; beveled edge on both long edges; without holes, cracks, or open seams.

1. Thickness: 1/2 inch.
2. Material: Solid surface acrylic resin, mineral filler, and pigments; non-porous, color and pattern consistent throughout thickness.
    a. Solid Polymer Fabricated: ASTM D638.
    b. Color and Pattern: As indicated on drawings.
    c. Manufacturers:
        1) Formica Corporation Product: Signatures: www.formica.com.
        2) Avonite Surfaces Product Avonite: www.avonitesurfaces.com.
        3) Dupont Product: Corian: www.corian.com.
        4) Panolam Industries International, Inc.(Nevamar); Product Fountainhead: www.nevamar.com.
        5) Wilsonart International, Inc Product: Gibralter: www.wilsonart.com.
        6) Substitutions: See Section 01 60 00 - Product Requirements.
3. Color and Pattern: As indicated on drawings.
4. Applications:
    a. At doorways where tile terminates.
    b. At open edges of floor tile where adjacent finish is a different height.

2.05 SETTING MATERIALS

A. Provide setting and grout materials from same manufacturer.

B. Interior adhesives, sealants, primers and sealants used as filler must meet the requirements of low emitting materials. Conform to SCAQMD 1168 and BAAQMD 8-51.

C. Latex-Portland Cement Mortar Bond Coat: ANSI A118.4.
1. Applications: Use where indicated on drawings and where no other type of bond coat is indicated.
2. Products:
    a. ARDEX Engineered Cements; ARDEX X 5: www.ardexamericas.com/#sle.
    b. Custom Building Products; ProLite Premium Rapid Setting Large Format Tile Mortar, with Multi-Surface Bonding Primer: www.custombuildingproducts.com/#sle.
    c. LATICRETE International, Inc; TRI-LITE: www.laticrete.com/#sle.
    d. Mapei Corporation; Adesilex P10 Mosaic & Glass Tile: www.mapei.com/#sle.
    e. Merkrete, by Parex USA, Inc; Merkrete 735 Premium Flex: www.merkrete.com/#sle.
        1) Local Representative: Rick Coury, Tile Industry Sales, Inc. RickTCoury@gmail.com; 714.915.1995.
    f. Sika Corp; SikaTile 500 LHT: www.sika.com/#sle.
    g. Substitutions: See Section 01 60 00 - Product Requirements.

D. Improved Latex-Portland Cement Mortar Bond Coat: ANSI A118.15.
1. Applications: Use where large and heavy tile mortar is indicated on drawings.

2. Products:
    a. ARDEX Engineered Cements; S 28: www.ardexamericas.com/#sle.
    b. Custom Building Products; Complete Contact-LFT Premium Rapid Setting Large Format Tile Mortar, with Multi-Surface Bonding Primer: www.custombuildingproducts.com/#sle.
    c. LATICRETE International, Inc; MULTIMAX LITE: www.laticrete.com/#sle.
    d. Mapei Corporation; Ultraflex LFT: www.mapei.com/#sle.
    e. Merkrete, by Parex USA, Inc: www.merkrete.com/#sle.
    f. Sika Corp; SikaTile 450 LHT Secure Set: www.sika.com/#sle.
    g. Substitutions: See Section 01 60 00 - Product Requirements.

E. Epoxy Adhesive and Mortar Bond Coat: ANSI A118.3.
    1. Applications: Where indicated on drawings.
    2. Products:
        a. Custom Building Products; EBM-Lite Epoxy Bonding Mortar: www.custombuildingproducts.com/#sle.
        b. LATICRETE International, Inc; LATICRETE LATAPOXY 300 Adhesive: www.laticrete.com/#sle.
        c. Mapei Corporation; Kerapoxy 410: www.mapei.com/#sle.
        d. Merkrete, by Parex USA, Inc; Merkrete Pro Epoxy: www.merkrete.com/#sle.
        e. Sika Corp; SikaTile 825 Epoxy: www.sika.com/#sle.
        f. Substitutions: See Section 01 60 00 - Product Requirements.

F. Dry-Set Portland Cement Mortar Bond Coat: ANSI A118.1.

G. Mortar Bed Materials: Pre-packaged mix of Portland cement, sand, latex additive, and water.
    1. Products:
        a. ARDEX Engineered Cements; A 38: www.ardexamericas.com/#sle.
        b. Custom Building Products; ProLite Tile & Stone Mortar: www.custombuildingproducts.com.
        c. LATICRETE International, Inc; LATICRETE 3701 Fortified Mortar Bed: www.laticrete.com/#sle.
        d. Mapei Corporation; 4 to 1 Mud Bed Mix: www.mapei.com/#sle.
        e. Merkrete, by Parex USA, Inc; Merkrete Underlay C: www.merkrete.com/#sle.
        f. Substitutions: See Section 01 60 00 - Product Requirements.

2.06 GROUTS

A. Provide setting and grout materials from same manufacturer.

B. High Performance Polymer Modified Grout: ANSI A118.7 polymer modified cement grout.
    1. Use sanded grout for joints 1/8 inch wide and larger; use unsanded grout for joints less than 1/8 inch wide.

2. Color: As selected by Architect from manufacturer's full line.
3. Products:
    a. Basis of Design: Custom Building Products; Fusion Pro Single Component Grout: www.custombuildingproducts.com/#sle.
    b. ARDEX Engineered Cements; ARDEX FL: www.ardexamericas.com/#sle.
    c. Custom Building Products; Prism Color Consistent Grout: www.custombuildingproducts.com/#sle.
    d. LATICRETE International, Inc; LATICRETE PERMACOLOR Grout: www.laticrete.com/#sle.
    e. Mapei Corporation; Ultracolor Plus FA: www.mapei.com/#sle.
    f. Merkrete, by Parex USA, Inc; Merkrete Pro Grout Plus: www.merkrete.com/#sle.
    g. Sika Corp; SikaTile Secure Grout: www.sika.com/#sle.
    h. Substitutions: See Section 01 60 00 - Product Requirements.

C. Epoxy Grout: ANSI A118.3 chemical resistant and water-cleanable epoxy grout.
1. Applications: Toilet room floors.
2. Color: As selected by Architect from manufacturer's full line.
3. Products:
    a. ARDEX Engineered Cements; ARDEX WA: www.ardexamericas.com/#sle.
    b. Basis of Design: Custom Building Products; CEG-Lite 100% Solids Commercial Epoxy Grout: www.custombuildingproducts.com/#sle.
    c. TEC Specialty Products LLC; TEC AccuColor EFX Epoxy Special Effects Grout: www.tecspecialty.com/#sle.
    d. LATICRETE International, Inc; LATICRETE SPECTRALOCK PRO Premium Grout: www.laticrete.com/#sle.
    e. MAPEI Corporation; Kerapoxy Epoxy Grout: www.mapei.com.
    f. Merkrete, by Parex USA, Inc; Merkrete Pro Epoxy: www.merkrete.com/#sle.
    g. Sika Corp; SikaTile 825 Epoxy: www.sika.com/#sle.
    h. Substitutions: See Section 01 60 00 - Product Requirements.

D. Stain Resistant Grout Additive: Liquid admixture for sanded and unsanded cement-based grouts; mix with dry grout material in place of water.
1. Applications: Toilet room floors.

2.07 MAINTENANCE MATERIALS

A. Tile Sealant: Gunnable, silicone, siliconized acrylic, modified silane polymer, or urethane sealant; moisture- and mildew-resistant type.
1. Applications: Between tile and plumbing fixtures.
2. Color: As selected by Architect from manufacturer's full line.
3. Products:

a. ARDEX Engineered Cements; ARDEX SX: www.ardexamericas.com/#sle.

b. Custom Building Products; Commercial 100% Silicone Caulk: www.custombuildingproducts.com/#sle.

c. LATICRETE International, Inc; LATICRETE LATASIL: www.laticrete.com/#sle.

d. Mapei Corporation; Mapesil T Plus: www.mapei.com/#sle.

e. Sika Corp; Sikasil N Plus: www.sika.com/#sle.

f. Substitutions: See Section 01 60 00 - Product Requirements.

B. Grout Sealer: Liquid-applied, moisture and stain protection for existing or new Portland cement grout.

1. Composition: Water-based colorless silicone.

2. Products:

a. Specified Manufacturer: Aqua-Mix: www.custombuildingproducts.com; local representative Dale Roberts (951) 255-0243.

b. MAPEI Corporation; UltraCare Grout Sealer: www.mapei.com.

c. Merkrete, by Parex USA, Inc; Merkrete Revive: www.merkrete.com/#sle.

d. Substitutions: See Section 01 60 00 - Product Requirements.

C. Tile Sealer: Stain protection for ceramic tile and natural stone tile.

1. Products:

a. Custom Building Products; Aqua Mix Enrich 'N' Seal: www.custombuildingproducts.com/#sle.

b. MAPEI Corporation; UltraCare Enhancing Plus Stone Sealer: www.mapei.com.

c. Rust-Oleum Corporation; Miracle Sealants 511 H20 Plus: www.rustoleum.com/#sle.

d. STONETECH, a division of LATICRETE International, Inc; STONETECH BulletProof Sealer: www.laticrete.com/#sle.

e. Substitutions: See Section 01 60 00 - Product Requirements.

D. Grout Release: Temporary, water-soluble pre-grout coating.

1. Products:

a. Custom Building Products; Aqua Mix Grout Release: www.custombuildingproducts.com/#sle.

b. LATICRETE International, Inc; STONETECH Grout Release: www.laticrete.com/#sle.

c. MAPEI Corporation; UltraCare Grout Release: www.mapei.com.

d. Substitutions: See Section 01 60 00 - Product Requirements.

2.08 ACCESSORY MATERIALS

A. Concrete Floor Slab Crack Isolation Membrane: Material complying with ANSI A118.12; not intended as waterproofing.

1. Crack Resistance: No failure at 1/8 inch gap, minimum.

2. Fluid or Trowel Applied Type:

a. Material: Synthetic rubber or Acrylic.

b. Thickness: 20 mils, maximum.

c. Products:

1) Custom Building Products; Custom 9240 Waterproofing and Anti-Fracture Membrane: www.custombuildingproducts.com.

2) LATICRETE International, Inc; LATICRETE FRACTURE BAN SC: www.laticrete.com/#sle.

3) Mapei Corporation; Mapelastic CI: www.mapei.com/#sle.

4) Merkrete, by Parex USA, Inc; Merkrete Fracture Guard: www.merkrete.com/#sle.

5) Sika Corp; SikaTile 200 Fracture Guard Rapid: www.sika.com/#sle.

6) Substitutions: See Section 01 60 00 - Product Requirements.

B. Waterproofing Membrane at Floors: Specifically designed for bonding to cementitious substrate under thick mortar bed or thin-set tile; complying with ANSI A118.10.

1. Crack Resistance: No failure at 1/16-inch gap, minimum; comply with ANSI A118.12.

2. Fluid or Trowel Applied Type:

a. Material: Synthetic rubber or Acrylic.

b. Thickness: 25 mils, minimum, dry film thickness.

c. Products:

1) ARDEX Engineered Cements; ARDEX 8+9: www.ardexamericas.com/#sle.

2) Custom Building Products; RedGard Crack Prevention and Waterproofing Membrane: www.custombuildingproducts.com/#sle.

3) LATICRETE International, Inc; LATICRETE HYDRO BAN: www.laticrete.com/#sle.

4) Mapei Corporation; Mapelastic AquaDefense: www.mapei.com/#sle.

5) Merkrete, by Parex USA, Inc; Merkrete Hydro Guard SP-1: www.merkrete.com/#sle.

6) Protecto Wrap: www.protectowrap.com/#sle.

7) Sika Corp; SikaTile 100 Moisture Guard: www.sika.com/#sle.

8) USG Corporation; Durock Brand Waterproofing Membrane: www.usg.com/#sle.

9) Substitutions: See Section 01 60 00 - Product Requirements.

C. Waterproofing Membrane at Showers and Tiled Tubs: Specifically designed for bonding to cementitious substrate under thick mortar bed or thin-set tile; complying with ANSI A118.10.

1. Fluid or Trowel Applied Type:

a. Material: Synthetic rubber.

b. Thickness: 25 mils, minimum, dry film thickness.

c. Products:

1) Custom Building Products; RedGard Crack Prevention and Waterproofing Membrane: www.custombuildingproducts.com/#sle.

2) LATICRETE International, Inc; HYDRO BAN: www.laticrete.com/#sle.

3) Merkrete, by Parex USA, Inc; Merkrete Hydro Guard 2000: www.merkrete.com/#sle.

4) USG Corporation; Durock Brand Liquid Waterproofing Membrane: www.usg.com/#sle.

5) Sika Corp; SikaTile 100 Moisture Guard: www.sika.com/#sle.

6) Substitutions: See Section 01 60 00 - Product Requirements.

D. Reinforcing Mesh: 2 by 2 inch size weave of 16/16 wire size; welded fabric, galvanized.

E. Membrane at Walls: Placed behind the backer board.

1. Material: No. 15 asphalt saturated felt.

F. Backer Board: Cementitious type complying with ANSI A118.9; high density, glass fiber reinforced, 5/8 inch thick; 2 inch wide coated glass fiber tape for joints and corners.

1. Products:

a. Custom Building Products; WonderBoard Lite Backerboard: www.custombuildingproducts.com/#sle.

b. Substitutions: See Section 01 60 00 - Product Requirements.

G. Mesh Tape: 2 inch wide self-adhesive fiberglass mesh tape.

PART 3 EXECUTION

3.01 REGULATORY REQUIREMENTS FOR INSTALLATION

A. California Plumbing Code:

1. Floor Drains:

a. Floors shall be sloped maximum 2% to drains. CPC 418.5 & CBC 11B-305.2.

2. Shower receptors shall conform to the requirements for plumbing fixtures. CPC 411.5.

a. Each shower receptor shall be constructed to have a dam, curb or threshold that is not less than 1 inch lower than the sides and back of such receptor. In no case shall any dam or threshold be less than 2 inches or exceed 9 inches in depth when measured from the top of the dam or threshold to the top of the drain. Each receptor shall be provided with an integral flange to be located where the receptor meets the vertical surface of the finished interior of the shower compartment. CPC 411.6

1) Water tight flange to extend minimum 1 inch above the top sides of the receptor. CPC 411.6.

2) Finished floor slope: min. 1/4 inch per ft.; max. 1/2 inch per ft. CPC 411.6.

3) CPC 411.6 Exception: Showers designed to comply with the accessibility standards listed in CPC Table 4-1.

b. Shower Dimensions (CPC 411.7): Min. 1,024 sq. in. and a 30 inch circle.

1) Min. height (CPC 411.7): 70 inches above the shower drain.
2) Exception: Accessible showers per CBC Chapter 11B.

3. Built-up Shower Receptors (CPC 411.8):
   a. Provide a water-tight approved flanged floor drain.
   b. Extend water-tight lining to a minimum of 3 inches above the finished dam or threshold height; including any other horizontal surfaces such as seats, shelves, or benches.
   c. Provide a solid sub-base.
   d. Lining floor slope: 1/4 inch per ft. toward the drain weep holes.
   e. Folds, Laps and Reinforcing Webbing: Min. 4 inch overlap.
   f. Webbing Tensile Strength: 50 psi, either direction.
   g. Subdrain shall set flush with the sub-base with a clamping ring and weep holes.
      1) Weep holes shall be protected from clogging.
   h. Shower lining materials shall conform to approved standards acceptable to OSHPD.
   i. Field Test (CPC 418.1):
      1) Test each shower receptor for water tightness by filling with water to the level of the rough threshold.
      2) Place the test plug to subject both levels of the drain, subpan and clamping ring to standing water.

3.02 EXAMINATION

A. Verify subfloor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive tile.
   1. Walls and floors to be level, plumb and true to within the listed for each applicable TCNA (HB) assembly method used.

B. Verify wall surfaces are smooth and flat within tolerances specified for that type of work, are dust-free, and are ready to receive tile.

C. Verify that subfloor surfaces are dust free and free of substances that could impair bonding of setting materials to subfloor surfaces.

D. Cementitious Subfloor Surfaces: Verify that substrates are ready for tiling installation by testing for moisture and alkalinity (pH).
   1. Test in accordance with Section 09 05 61.
   2. Obtain instructions if test results are not within limits recommended by tiling material manufacturer and setting material manufacturer.
   3. Follow moisture and alkalinity remediation procedures in Section 09 05 61.

E. Verify that required floor-mounted utilities are in correct location.

3.03 PREPARATION

A. Shade work from direct sunlight during tile installation as needed to prevent rapid evaporation caused by excessive heat.

B. Vacuum clean surfaces and damp clean.

C. Seal substrate surface cracks with filler.

D. Install cementitious backer board in accordance with ANSI A108.11 and board manufacturer's instructions. Tape joints and corners, cover with skim coat of setting material to feather edge.

E. Prepare substrate surfaces for adhesive installation in accordance with adhesive manufacturer's instructions.

3.04 INSTALLATION - GENERAL

A. Waterproof/Anti-Fracture Membrane Application: Comply with manufacturer's written instructions and recommendations for substrate, tile setting method and Project conditions.

B. Expansion Joints: Provide expansion joints at locations and spacings as recommended by TCNA (HB) Detail EJ171 and as indicated on Drawings. Keep joints free of setting bed mix and grout.

C. Lay tile to pattern indicated on drawings. Do not interrupt tile pattern through openings.

D. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.

E. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.

F. Form internal angles square and external angles bullnosed.

G. Install non-ceramic trim in accordance with manufacturer's instructions.

H. Install thresholds where indicated on drawings.

I. Sound tile after setting. Replace hollow sounding units.

J. Keep control and expansion joints free of mortar, grout, and adhesive.

K. Prior to grouting, allow installation to completely cure; minimum of 48 hours.

L. Grout tile joints unless otherwise indicated on drawings. Use standard grout unless otherwise indicated on drawings.

M. At changes in plane and tile-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.

3.05 INSTALLATION - FLOORS - THIN-SET METHODS

A. Over interior concrete substrates, install in accordance with TCNA (HB) Method F113, dry-set or latex-Portland cement bond coat, on ground, with standard grout, unless otherwise indicated on drawings.

1. Where waterproofing membrane is indicated on drawings, install in accordance with TCNA (HB) Method F122, with latex-Portland cement grout, on ground.

B. Install tile-to-tile floor movement joints in accordance with TCNA (HB) Method EJ171F.

3.06 INSTALLATION - FLOORS - MORTAR BED METHODS

A. Over exterior concrete substrates, install in accordance with TCNA (HB) Method F101, bonded, with standard grout.

B. Over interior concrete substrates, install in accordance with TCNA (HB) Method F111, with cleavage membrane, unless otherwise indicated on drawings.
   1. Where waterproofing, cleavage, or crack isolation membrane is indicated on drawings, with standard grout or no mention of grout type, install in accordance with TCNA (HB) Method F121.

C. Cleavage Membrane: Lap edges and ends.

D. Waterproofing Membrane: Install as recommended by manufacturer .

E. Mortar Bed Thickness: 1-1/4 inch, unless otherwise indicated.

3.07 INSTALLATION - FLOORS - FLOATING

A. Install in accordance with manufacturer's instructions.

B. Grout with standard grout.

3.08 INSTALLATION - WALL TILE

A. On exterior walls, install in accordance with TCNA (HB) Method W244E, thin-set over cementitious backer units, with waterproofing membrane.

B. Over cementitious backer units on studs, install in accordance with TCNA (HB) Method W244C, using membrane at toilet rooms.

3.09 GROUTING

A. Joint Width: As follows unless indicated otherwise on Drawings.
   1. Glazed Wall Tile, Unmounted: As determined by spacing lugs.
   2. Porcelain Floor Tile: 1/4 inch.
   3. Mounted Tile: As determined by factory-produced spacing.
   4. Trim and Accessories: Match adjoining tile units.

B. Wall Tile Grouting: TCNA/ANSI A108.10, latex-portland cement.

C. Floor Tile Grouting: TCNA/ANSI A108.10, latex-portland cement.

D. Do not begin grouting tiles until they are firmly set and a minimum of 48 hours of curing has occurred.

E. Remove spacers, ropes, glue, and similar foreign matter prior to grouting.

F. When using proprietary grout, comply with manufacturer's instructions and recommendations unless otherwise more stringent requirements are specified.

G. Force maximum amount of approved grout into joints in accordance with pertinent recommendations contained in TCNA/ANSI A108.10.

H. Fill joints of cushion-edge tile to depth of cushion; fill joints of square-edge tile flush with tile surface.

I. Fill all gaps and skips.

J. Do not permit mortar or mounting mesh to show through grouted joints.

K. Provide hard finished grout which is uniform in color, smooth, and without voids, pin holes, or low spots.

L. Leave tile clean.

3.10 TOLERANCES

A. Subsurface Guidelines: Refer to TCNA (HB) for a complete guidelines.

Mortar Bed	1/4 inch: 10 feet
Thin Bed w/ cementitious bonding material w/ Tiles <15"	1/4 inch: 10 feet from plane Maximum 1/16 inch variation in 12 inches from high points.
Thin Bed w/ cementitious bonding material w/ Tiles any side >15"	1/8 inch: 10 feet from plane Maximum 1/16 inch variation in 24 inches from high points.
Thin Bed w/ organic adhesive bonding material w/ Tiles any side >15"	1/16 inch in 3 feet No abrupt irregularities >1/32 inch

B. Lippage Guidelines: Refer to TCNA (HB) for a complete guidelines.

Tile Type	Tile Size (in.)	Joint Width (in.)	Allowable Lippage (in.)
Glazed Wall/ Mosaics	1 x 1 to 6 x 6	1/16 to 1/8	1/32
Quarry	6 x 6 to 8 x 8	1/4 or greater	1/16
Pressed Floor and Porcelain Tiles	All	1/16 to less than 1/4	1/32
Pressed Floor and Porcelain Tiles	All	1/4 or greater	1/16

3.11 JOINT SEALANT

A. Apply sealant after tile is grouted, grout is cured and tile field is thoroughly clean and dry.

B. Seal between tile and all penetrating elements.

C. Seal perimeter of tile field where tile base is not provided.

D. Sealant Locations shall include:

1. Around plumbing penetrations.
2. Around door frames and other items set in wall.

E. Refer to Section 07 92 00 - Joint Sealants for additional requirements.

3.12 GROUT SEALER

A. Clean grout and apply sealer in accordance with manufacturer's instructions and recommendations.

3.13 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for additional requirements.

B. Provide manufacturer's field representative to inspect waterproofing.

C. Test shower linings with standing water to the top of the rough threshold for a period of minimum 24 hours. CPC 418.1.
    1. A test plug shall be so placed that both the upper and under sides of the lining shall be subjected to test at its point of contact with the sub-drain.
        a. When the test plug is removed, all of the test water shall drain out by gravity through the weep holes.
        b. A ring of non-absorbent material must be placed around the weep holes to keep them open when the finish materials are installed.
    2. Verify water level has not changed beyond normal evaporation.
    3. Inspect floor below and adjacent surfaces for leaks.
D. Repair or remove and reinstall as required.
E. Repeat until a satisfactory result is achieved.

3.14 CLEANING

A. Clean tile and grout surfaces.

3.15 PROTECTION

A. Do not permit traffic over finished floor surface for 4 days after installation.

END OF SECTION

SECTION 09 65 00
RESILIENT FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Resilient tile flooring.

B. Resilient base.

C. Installation accessories.

1.02 RELATED REQUIREMENTS

A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 03 30 00 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors to receive adhesive-applied resilient flooring.

C. Section 09 05 61 - Common Work Results for Flooring Preparation: Concrete slab moisture and alkalinity testing and remediation procedures.

1. Remedial Floor coating is required under all resilient flooring.

1.03 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design.

B. ANSI A326.3 - American National Standard Test Method for Measuring Dynamic Coefficient of Friction of Hard Surface Flooring Materials.

C. ANSI/NFSI B101.3 - Test Method for Measuring the Wet DCOF of Hard Surface Walkways.

D. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.

E. ASTM E662 - Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials.

F. ASTM F150 - Standard Test Method for Electrical Resistance of Conductive and Static Dissipative Resilient Flooring.

G. ASTM F1700 - Standard Specification for Solid Vinyl Floor in Modular Format such as Tile(s) or Plank(s).

H. CBC Ch. 11B - California Building Code-Chapter 11B.

I. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.

J. RFCI (RWP) - Recommended Work Practices for Removal of Resilient Floor Coverings.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.

C. Shop Drawings: Indicate seaming plans and floor patterns.

D. Selection Samples: Submit manufacturer's complete set of color samples for Architect's initial selection.

E. Verification Samples: Submit two samples, 2 by 2 inch in size illustrating color and pattern for each resilient flooring product specified.

F. Concrete Subfloor Test Report: Submit a copy of the moisture and alkalinity (pH) test reports.

G. Certification: Prior to installation of flooring, submit written certification by flooring manufacturer and adhesive manufacturer that condition of subfloor is acceptable.

H. Manufacturer's Qualification Statement.

I. Installer's Qualification Statement.

J. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing specified flooring with minimum ten years documented experience.

B. Installer Qualifications: Company specializing in installing specified flooring with minimum three years documented experience.

C. Testing Agency Qualifications: Independent firm specializing in performing concrete slab moisture testing and inspections of the type specified in this section.

1.06 WARRANTY

A. Provide 10-year Commercial Limited Warranty.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Upon receipt, immediately remove any shrink-wrap and check materials for damage and the correct style, color, quantity and run numbers.

B. Store all materials off of the floor in an acclimatized, weather-tight space.

C. Maintain temperature in storage area between 55 degrees F and 90 degrees F.

1.08 FIELD CONDITIONS

A. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

A. All products used shall meet VOC requirements listed in Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.

B. All products used for flooring installation shall comply with flammability and smoke classifications for various locations of installation. Comply with applicable requirements of California Building Code (CBC) Chapter 8.

1. Smoke Density: ASTM E662 Rating to be less than 450 Dm (Optical Density) in flaming mode. (CBC 804.4.1).

C. Requirements for persons with disabilities: Provide flooring meeting slip-resistant requirements of California Code of Regulations (CCR), Title 24, Part 2, CBC Ch. 11B and ADA Standards, latest amendment.

1. Flooring demonstrating a coefficient meeting the intent of slip resistance; CBC Ch. 11B-302 Floor or Ground Surfaces, CBC Ch. 11B-403 Walking Surfaces, and ADA Standards.
2. Flooring surface shall be stable, firm, and slip resistant. CBC Ch. 11B-302.1 General.
3. Flooring surface demonstrating a dynamic coefficient of friction of at least 0.42 wet per DCOF AcuTest ANSI A326.3, or ANSI/NFSI B101.3 (using a BOT-3000 testing unit) will be accepted as meeting the intent of slip resistance; CBC Ch. 11B-302 Floor or Ground Surfaces and ADA Standards.
    a. Ramp surface: Provide DCOF value of 0.46 wet.

2.02 TILE FLOORING

A. (LVT) Luxury Vinyl Tile: Printed film type, with transparent or translucent wear layer.

1. Manufacturers:
    a. Armstrong Flooring; Natural Creations with Diamond 10 Technology: www.armstrongflooring.com/#sle.
    b. Mannington Commercial: www.manningtoncommercial.com#sle.
    c. Shaw Contract : www.shawcontract.com.
    d. Substitutions: See Section 01 60 00 - Product Requirements.
2. Minimum Requirements: Comply with ASTM F1700, of Class corresponding to type specified.
3. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E 648, NFPA 253, ASTM E 648, or NFPA 253.
4. VOC Content Limits: As specified in Section 01 61 16.
5. NSF 332 Certification: Gold level.
6. Plank Tile Size: 6 by 48 inch.
7. Wear Layer Thickness: 0.020 inch.
8. Total Thickness: 0.125 inch.
9. Color: As indicated on drawings.

2.03 RESILIENT BASE

A. Resilient Base - Type RB-1: ASTM F1861, Type TS rubber, vulcanized thermoset; Style B, Cove.

1. Manufacturers:
    a. Armstrong; Wall Base: www.armstrongflooring.com.

b. Mannington Commercial; Burke: www.manningtoncommercial.com#sle.

c. Roppe Corporation: www.roppe.com/#sle.

d. Tarkett Flooring; Johnsonite Wall Base: www.tarkett.com/#sle.

e. Substitutions: See Section 01 60 00 - Product Requirements.

2. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E 648, NFPA 253, ASTM E 648, or NFPA 253.
3. Height: 4 inches.
4. Thickness: 0.125 inch.
5. Finish: Satin.
6. Length: 4 foot sections.
7. Color: As indicated on drawings.
8. Accessories: Premolded external corners and internal corners.

2.04 ACCESSORIES

A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.

B. Primers, Adhesives, and Seam Sealer: Waterproof; types recommended by flooring manufacturer.

1. VOC Content Limits: As specified in Section 01 61 16.

C. Moldings, Transition and Edge Strips: Same material as flooring.

D. Filler for Coved Base: Plastic.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.

B. Cementitious Subfloor Surfaces: Verify that substrates are ready for resilient flooring installation by testing for moisture and alkalinity (pH).

1. Test in accordance with Section 09 05 61.
2. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.

C. Environmental Condition: Comply with flooring manufacturer's instructions and recommendations.

1. Verify that ambient and surface temperatures and humidity conditions are in compliance.

D. Verify that required floor-mounted utilities are in correct location.

E. Material Inspection:

1. In accordance with manufacturer's installation requirements, visually inspect materials prior to installation.
2. Material with visual defects shall not be installed.
3. Labor costs required to replace material installed with visual defects shall be the responsibility of the installation contractor.

3.02 PREPARATION

A. Prepare floor substrates for installation of flooring in accordance with Section 09 05 61.

B. Clean substrate.

3.03 INSTALLATION - GENERAL

A. Starting installation constitutes acceptance of sub-floor conditions. Beginning of installation means acceptance of existing substrate and site conditions and assumes responsibility for correcting unsuitable conditions at no additional cost to the District.

B. Install in accordance with manufacturer's written instructions.

1. Compliance: Comply with manufacturer's product data, including product technical bulletins, product catalog installation instructions, and product carton instructions for installation.

C. Adhesive-Applied Installation:

1. Spread only enough adhesive to permit installation of materials before initial set.

D. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.

E. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

F. Install feature strips where indicated.

3.04 INSTALLATION - TILE FLOORING

A. Mix tile from container to ensure shade variations are consistent when tile is placed, unless otherwise indicated in manufacturer's installation instructions.

B. Lay flooring with joints and seams parallel to building lines to produce symmetrical pattern.

C. Install plank tile with a random offset of at least 6 inches from adjacent rows.

3.05 INSTALLATION - RESILIENT BASE

A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.

B. Miter internal corners. At external corners, use premolded units. At exposed ends, use premolded units.

C. Install base on solid backing. Bond tightly to wall and floor surfaces.

D. Scribe and fit to door frames and other interruptions.

3.06 CLEANING

A. Remove excess adhesive from floor, base, and wall surfaces without damage.

B. Clean in accordance with manufacturer's written instructions.

C. Installation Clean-Up: Upon completion of installation in a room or area, clean flooring and adjacent surfaces.

1. Sweep or vacuum floor thoroughly.
2. Do no wash floor until time period recommended by resilient flooring manufacturer has elapsed to allow resilient flooring to become well-sealed in adhesive.
3. Remove excess adhesive or other surface blemishes, using appropriate cleaner recommended by resilient flooring manufacturers.

D. Initial Cleaning: After adhesive has set but no sooner than 5 days after installation, wash resilient tile flooring with a neutral type cleaning solution in accordance with manufacturer's instructions and recommendations. Rinse thoroughly with clear, cool water but do not flood floor.

1. After completion of installation, apply one coat of polish, if recommended by manufacturer, and buff to even luster.
2. After final cleaning, apply second coat of polish as recommended by tile manufacturer and buff to even luster.

E. Final Cleaning: Thoroughly clean resilient tile flooring and accessories in accordance with final cleaning specified in Section 01 70 00 - Execution and Closeout Requirements.

1. Clean resilient flooring not more than 4 days prior to date scheduled for inspections intended to establish date of substantial completion in each area of Project.
2. Clean resilient flooring by method recommended by resilient flooring manufacturer, including stripping and application of additional floor polish and buffing to even luster.

3.07 PROTECTION

A. Prohibit traffic on resilient flooring for 48 hours after installation.

B. From the time of laying until Acceptance, protect flooring from damage.

1. Lay reinforced kraft paper runners and provide barricades and signs as necessary to prevent construction traffic on completed installations.
2. Protect resilient flooring against damage from rolling loads for initial period following installation by covering with plywood or hardboard. Use dollies to move stationary equipment or furnishings across floors.
3. Remove and replace defects which develop such as damaged, loose or broken tile and resilient accessories.

END OF SECTION

SECTION 09 91 13
EXTERIOR PAINTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints.

C. Materials for backpriming woodwork.

D. Scope: Finish exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:

1. Exposed surfaces of steel lintels and ledge angles.
2. Exterior Plaster.
3. Mechanical and Electrical:
    a. On the roof and outdoors, paint equipment exposed to weather or to view, including factory-finished materials.

E. Do Not Paint or Finish the Following Items:

1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
2. Items indicated to receive other finishes.
3. Items indicated to remain unfinished.
4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
5. Non-metallic roofing and flashing.
6. Stainless steel, anodized aluminum, bronze, terne-coated stainless steel, zinc, and lead.
7. Floors, unless specifically indicated.
8. Glass.
9. Concealed pipes, ducts, and conduits.

1.02 RELATED REQUIREMENTS

A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 05 50 00 - Metal Fabrications: Shop-primed items.

C. Section 09 91 23 - Interior Painting.

1.03 DEFINITIONS

A. Comply with ASTM D16 for interpretation of terms used in this section.

1.04 REFERENCE STANDARDS

A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency.

B. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications.

C. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials.

D. CARB (SCM) - Suggested Control Measure for Architectural Coatings; California Air Resources Board.

E. SCAQMD 1113 - Architectural Coatings.

F. SSPC-SP 1 - Solvent Cleaning.

G. SSPC-SP 2 - Hand Tool Cleaning.

H. SSPC-SP 6/NACE No.3 - Commercial Blast Cleaning.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide complete list of products to be used, with the following information for each:

1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
2. MPI product number (e.g. MPI #47).
3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.
4. Manufacturer's installation instructions.
5. If proposal of substitutions is allowed under submittal procedures, explanation of substitutions proposed.

C. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.

1. Where sheen is specified, submit samples in only that sheen.
2. Where sheen is not specified, discuss sheen options with Architect before preparing samples, to eliminate sheens not required.
3. FOR ALL FINISHES tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color.

D. Certification: By manufacturer that paints and finishes comply with VOC limits specified.

E. Manufacturer's Instructions: Indicate special surface preparation procedures.

F. Maintenance Data: Submit data including finish schedule showing where each product/color/finish was used, product technical data sheets, material safety data sheets (MSDS), care and cleaning instructions, touch-up procedures, repair of painted and finished surfaces, and color samples of each color and finish used.

G. Maintenance Materials: Furnish the following for District's use in maintenance of project.

1. See Section 01 60 00 - Product Requirements, for additional provisions.
2. Extra Paint and Finish Materials: 1 gallon of each color; from the same product run, store where directed.
3. Label each container with color in addition to the manufacturer's label.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.

B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum three years documented experience, approved by manufacturer, and with minimum three years documented experience.

1.07 MOCK-UPS

A. See Section 01 40 00 - Quality Requirements, for general requirements for mock-up.

B. Provide panel, 12 feet high by 8 feet wide, illustrating paint color, texture, and finish.

C. Provide door and frame assembly illustrating paint color, texture, and finish.

D. Locate where directed by Architect.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.09 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the paint product manufacturer's temperature ranges.

B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

C. Do not apply exterior paint and finishes during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.

D. Minimum Application Temperatures for Latex Paints: 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.

E. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Provide paints and finishes from the same manufacturer to the greatest extent possible.

1. If a single manufacturer cannot provide specified products, minor exceptions will be permitted provided approval by Architect is obtained using the specified procedures for substitutions.
2. Substitution of other products by the same manufacturer is preferred over substitution of products by a different manufacturer.

B. Paints:
1. District Base Manufacturer: Vista Paint Corporation.
2. Vista Paint Corporation: www.vistapaint.com/#sle.

C. Primer Sealers: Same manufacturer as top coats.

D. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 PAINTS AND FINISHES - GENERAL

A. Paints and Finishes: Ready-mixed, unless required to be a field-catalyzed paint.
1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
2. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
3. For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color.
4. Supply each paint material in quantity required to complete entire project's work from a single production run.
5. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is described explicitly in manufacturer's product instructions.

B. No intentionally added cadmium.

C. Volatile Organic Compound (VOC) Content: Comply with Section 01 61 16.

D. Volatile Organic Compound (VOC) Content:
1. Provide paints and finishes that comply with the most stringent requirements specified in the following:
a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
b. SCAQMD 1113 Rule.
c. CARB (SCM).
d. Architectural coatings VOC limits of California.
2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.

E. Flammability: Comply with applicable code for surface burning characteristics.

F. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Architect from the manufacturer's full line.

G. Colors: As indicated on drawings.

1. Extend colors to surface edges; colors may change at any edge as directed by Architect.

2.03 PAINT SYSTEMS - EXTERIOR

A. Exterior Surfaces to be Painted, Unless Otherwise Indicated: Including cement board and primed metal.

1. One or two coats to cover and one coat primer.
2. Top Coat(s): Exterior Latex.
3. Top Coat Sheen:
    a. Flat: MPI gloss level 1; use this sheen at all locations.
    b. Semi-Gloss: MPI gloss level 5; use this sheen at trim.
4. Primer: As recommended by top coat manufacturer for specific substrate.

B. Ferrous Metals, Unprimed, Latex, 3 Coat:

1. One coat of latex primer.
2. Semi-gloss: Two coats of latex enamel.

C. Ferrous Metals, Primed, Latex, 2 Coat:

1. Touch-up with rust-inhibitive primer recommended by top coat manufacturer.
2. Semi-gloss: Two coats of latex enamel.

D. Ferrous Metals, Unprimed, High-Performance, 3 Coat:

1. Pre-Treatment: As recommended by manufacturer
2. One coat galvanize primer.
3. Gloss: Two coats of alkyd enamel.

2.04 PRIMERS

A. Primers: Provide the following unless other primer is required or recommended by manufacturer of top coats.

1. Alkali Resistant Water Based Primer.
2. Anti-Corrosive Alkyd Primer for Metal.
3. Interior/Exterior Quick Dry Alkyd Primer for Metal.
4. Alkyd Primer for Galvanized Metal.
5. Water Based Primer for Galvanized Metal.
6. Rust-Inhibitive Water Based Primer.
7. Interior/Exterior Quick Dry Primer for Aluminum.
8. Stain Blocking Primer.

2.05 ACCESSORY MATERIALS

A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.

B. Patching Material: Latex filler.

C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin application of paints and finishes until substrates have been properly prepared.

B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

D. Test shop-applied primer for compatibility with subsequent cover materials.

E. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:

1. Exterior Wood: 15 percent, measured in accordance with ASTM D4442.

3.02 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Remove or repair existing paints or finishes that exhibit surface defects.

D. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces for finishing.

E. Seal surfaces that might cause bleed through or staining of topcoat.

F. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

G. Galvanized Surfaces:

1. Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
2. Prepare surface according to SSPC-SP 2.

H. Ferrous Metal:

1. Solvent clean according to SSPC-SP 1.
2. Shop-Primed Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.
3. Remove rust, loose mill scale, and other foreign substances using methods recommended in writing by paint manufacturer and blast cleaning in accordance with SSPC-SP 6/NACE No.3. Protect from corrosion until coated.

I. Exterior Wood Surfaces to Receive Opaque Finish: Remove dust, grit, and foreign matter. Seal knots, pitch streaks, and sappy sections. Fill nail holes with tinted exterior calking compound after prime coat has been applied. Back prime concealed surfaces before installation.

J. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

3.03 APPLICATION

A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

B. Exterior Wood to Receive Opaque Finish: If final painting must be delayed more than 2 weeks after installation of woodwork, apply primer within 2 weeks and final coating within 4 weeks.

C. Apply products in accordance with manufacturer's written instructions.

D. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.

E. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

F. Apply each coat to uniform appearance.

G. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply additional coats until complete hide is achieved.

H. Sand metal surfaces lightly between coats to achieve required finish.

I. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

J. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for general requirements for field inspection.

B. District will provide field inspection.

C. Periodically test film thickness of each coat with wet film gage to ensure coatings are being applied to proper thickness.

D. Request review of each applied coat by Owner Representative or Architect before application of successive coats. Only reviewed coats will be considered in determining number of coats applied.

E. Immediately prior to Substantial Completion, perform detailed inspection of painted surfaces and repair or refinish abraded, stained, or otherwise disfigured surfaces.

3.05 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.06 PROTECTION

A. Protect finishes until completion of project.

B. Touch-up damaged finishes after Substantial Completion.

END OF SECTION

SECTION 09 91 23
INTERIOR PAINTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints.

C. Materials for backpriming woodwork.

D. Scope: Finish interior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.

1. Both sides and edges of plywood backboards for electrical and telecom equipment before installing equipment.
2. Prime surfaces to receive wall coverings.
3. Mechanical and Electrical:
    a. In finished areas, paint insulated and exposed pipes, conduit, boxes, and insulated and exposed ducts, unless otherwise indicated.
    b. In finished areas, paint shop-primed items.
    c. Paint interior surfaces of air ducts that are visible through grilles and louvers with one coat of flat black paint to visible surfaces.
    d. Paint dampers exposed behind louvers, grilles, and convector and baseboard cabinets to match face panels.

E. Do Not Paint or Finish the Following Items:

1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
2. Items indicated to receive other finishes.
3. Items indicated to remain unfinished.
4. Fire rating labels, equipment serial number and capacity labels, bar code labels, and operating parts of equipment.
5. Floors, unless specifically indicated.
6. Glass.
7. Concealed pipes, ducts, and conduits.

1.02 RELATED REQUIREMENTS

A. Section 05 50 00 - Metal Fabrications: Shop-primed items.

1.03 DEFINITIONS

A. Comply with ASTM D16 for interpretation of terms used in this section.

1.04 REFERENCE STANDARDS

A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency.

B. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications.

C. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials.

D. CARB (SCM) - Suggested Control Measure for Architectural Coatings; California Air Resources Board.

E. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual.

F. SCAQMD 1113 - Architectural Coatings.

G. SSPC-SP 1 - Solvent Cleaning.

H. SSPC-SP 2 - Hand Tool Cleaning.

I. SSPC-SP 6/NACE No.3 - Commercial Blast Cleaning.

J. SSPC-SP 13/NACE No.6 - Surface Preparation of Concrete.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide complete list of products to be used, with the following information for each:

1. Manufacturer's name, product name and/or catalog number, and general product category (e.g., "alkyd enamel").
2. MPI product number (e.g., MPI #47).
3. Cross-reference to specified paint system products to be used in project; include description of each system.
4. Manufacturer's installation instructions.
5. If proposal of substitutions is allowed under submittal procedures, explanation of substitutions proposed.

C. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.

1. Where sheen is specified, submit samples in only that sheen.
2. Where sheen is not specified, discuss sheen options with Architect before preparing samples, to eliminate sheens not required.
3. Allow 30 days for approval process, after receipt of complete samples by Architect.
4. Paint color submittals will not be considered until color submittals for major materials not to be painted, such as factory finished metals, wood cabinets, and wood doors, have been approved.

D. Certification: By manufacturer that paints and finishes comply with VOC limits specified.

E. Manufacturer's Instructions: Indicate special surface preparation procedures.

F. Maintenance Data: Submit data including finish schedule showing where each product/color/finish was used, product technical data sheets, material safety data sheets (MSDS), care and cleaning instructions, touch-up procedures, repair of painted and finished surfaces, and color samples of each color and finish used.

G. Maintenance Materials: Furnish the following for District's use in maintenance of project.

1. See Section 01 60 00 - Product Requirements, for additional provisions.
2. Extra Paint and Finish Materials: 1 gal of each color; from the same product run, store where directed.
3. Label each container with color in addition to the manufacturer's label.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.

B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum three years experience and approved by manufacturer.

1.07 MOCK-UP

A. See Section 01 40 00 - Quality Requirements, for general requirements for mock-up.

B. Locate where directed by Architect.

C. Mock-up may remain as part of the work.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.09 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

C. Do not apply materials when relative humidity exceeds 85 percent, at temperatures less than 5 degrees F above the dew point, or to damp or wet surfaces.

D. Minimum Application Temperatures for Paints: 50 degrees F for interiors unless required otherwise by manufacturer's instructions.

E. Provide lighting level of 80 fc measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Provide paints and finishes from the same manufacturer to the greatest extent possible.

1. If a single manufacturer cannot provide specified products; minor exceptions will be permitted provided approval by Architect is obtained using the specified procedures for substitutions.
2. Substitution of other products by the same manufacturer is preferred over substitution of products by a different manufacturer.

B. Paints:

1. District Base Manufacturer: Vista Paint Corporation.

C. Primer Sealers: Same manufacturer as top coats.

D. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 PAINTS AND FINISHES - GENERAL

A. Paints and Finishes: Ready-mixed, unless intended to be a field-catalyzed paint.

1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
2. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
3. For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color.
4. Supply each paint material in quantity required to complete entire project's work from a single production run.
5. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.

B. No intentionally added cadmium.

C. Volatile Organic Compound (VOC) Content:

1. Provide paints and finishes that comply with the most stringent requirements specified in the following:
   a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
   b. SCAQMD 1113 Rule.
   c. CARB (SCM).
   d. Architectural coatings VOC limits of California.
2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.

D. Flammability: Comply with applicable code for surface burning characteristics.

E. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Architect from the manufacturer's full line.

F. Colors: To be selected from manufacturer's full range of available colors.

1. Selection to be made by Architect after award of contract.
2. Extend colors to surface edges; colors may change at any edge as directed by Architect.
3. In finished areas, finish pipes, ducts, conduit, and equipment the same color as the wall/ceiling under which they are mounted.

2.03 PAINT SYSTEMS - INTERIOR

A. Interior Surfaces to be Painted, Unless Otherwise Indicated: Including gypsum board, concrete, concrete masonry units, brick, wood, plaster, uncoated steel, shop primed steel, galvanized steel, aluminum, and acoustical ceilings.

1. Two top coats and one coat primer.
2. Top Coat(s): Interior Latex.
3. Top Coat Sheen:
    a. Flat: MPI gloss level 1; use this sheen for ceilings and other overhead surfaces.
    b. Eggshell: MPI gloss level 3; use this sheen at all locations.
    c. Semi-Gloss: MPI gloss level 5; use this sheen at all locations.
4. Primer: As recommended by top coat manufacturer for specific substrate.

B. Medium Duty Door/Trim: For surfaces subject to frequent contact by occupants, including metals and wood:

1. Medium duty applications include doors, door frames, railings, handrails, and guardrails.
2. Two top coats and one coat primer.
3. Top Coat(s): Interior Light Industrial Coating, Water Based.
4. Top Coat Sheen:
    a. Semi-Gloss: MPI gloss level 5; use this sheen at all locations.

C. Medium Duty Vertical and Overhead: Including gypsum board, concrete, concrete masonry units, uncoated steel, shop primed steel, galvanized steel, and aluminum.

1. Two top coats and one coat primer.
2. Top Coat(s): High Performance Architectural Interior Latex.
3. Top Coat Sheen:
    a. Flat: MPI gloss level 1; use this sheen for ceilings and other overhead surfaces.
    b. Eggshell: MPI gloss level 3; use this sheen at all locations.
    c. Semi-Gloss: MPI gloss level 5; use this sheen at metal doors and frames.

D. Dry Fall: Metals; exposed structure and overhead-mounted services in utilitarian spaces, including shop primed steel deck, structural steel, metal fabrications, galvanized ducts, galvanized conduit, and galvanized piping.

1. Shop primer by others.
2. One top coat.
3. Top Coat: Latex Dry Fall.
4. Top Coat Sheen:
    a. Flat: MPI gloss level 1; use this sheen at all locations.
5. Primer: As recommended by top coat manufacturer for specific substrate.

E. Ferrous Metals, Unprimed, Latex, 3 Coat:
1. One coat of latex primer.
2. Semi-gloss: Two coats of latex enamel.

F. Ferrous Metals, Primed, Latex, 2 Coat:
1. Touch-up with latex primer.
2. Semi-gloss: Two coats of latex enamel.

G. Galvanized Metals, Latex, 3 Coat:
1. One coat galvanize primer.
2. Semi-gloss: Two coats of latex enamel.

2.04 PRIMERS

A. Primers: Provide the following unless other primer is required or recommended by manufacturer of top coats.
1. Interior Institutional Low Odor/VOC Primer Sealer.
2. Interior/Exterior Latex Block Filler.
3. Interior Latex Primer Sealer.
4. Interior Drywall Primer Sealer.
5. Anti-Corrosive Alkyd Primer for Metal.
6. Interior Rust-Inhibitive Water Based Primer.
7. Interior Water-Based Primer for Galvanized Metal; MPI #134 or 134 X-Green.
8. Interior Alkyd Enamel Undercoat.
9. Stain Blocking Primer.
10. Stain Blocking Primer, Water Based.

2.05 ACCESSORY MATERIALS

A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.

B. Patching Material: Latex filler.

C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin application of paints and finishes until substrates have been adequately prepared.

B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

D. Test shop-applied primer for compatibility with subsequent cover materials.

E. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces is below the following maximums:

1. Gypsum Wallboard: 12 percent.
2. Plaster and Stucco: 12 percent.
3. Masonry, Concrete, and Concrete Masonry Units: 12 percent.
4. Interior Wood: 15 percent, measured in accordance with ASTM D4442.

3.02 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.

D. Seal surfaces that might cause bleed through or staining of topcoat.

E. Concrete:

1. Remove release agents, curing compounds, efflorescence, and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.
2. Prepare surface as recommended by top coat manufacturer and in accordance with SSPC-SP 13/NACE No.6.

F. Masonry:

G. Gypsum Board: Fill minor defects with filler compound. Spot prime defects after repair.

H. Plaster: Fill hairline cracks, small holes, and imperfections with latex patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high-alkali surfaces.

I. Insulated Coverings: Remove dirt, grease, and oil from canvas and cotton.

J. Aluminum: Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.

K. Galvanized Surfaces:

1. Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
2. Prepare surface according to SSPC-SP 2.

L. Ferrous Metal:

1. Solvent clean according to SSPC-SP 1.
2. Shop-Primed Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.
3. Remove rust, loose mill scale, and other foreign substances using methods recommended in writing by paint manufacturer and blast cleaning in accordance with SSPC-SP 6/NACE No.3. Protect from corrosion until coated.

M. Wood Surfaces to Receive Opaque Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Back prime concealed surfaces before installation.

N. Wood Doors to be Field-Finished: Seal wood door top and bottom edge surfaces with clear sealer.

3.03 APPLICATION

A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

B. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".

C. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

D. Apply each coat to uniform appearance in thicknesses specified by manufacturer.

E. Sand wood and metal surfaces lightly between coats to achieve required finish.

F. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

G. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for general requirements for field inspection.

B. District will provide field inspection.

3.05 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.06 PROTECTION

A. Protect finishes until completion of project.

B. Touch-up damaged finishes after Substantial Completion.

END OF SECTION

SECTION 10 14 23
PANEL SIGNAGE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Panel signage.

1.02 REFERENCE STANDARDS

A. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines.

B. ADA Standards - 2010 ADA Standards for Accessible Design.

C. CBC - California Building Code.

D. CBC Chapter 11B - California Building Code-Chapter 11B.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Manufacturer's product literature for each type of panel sign, indicating styles, font, foreground and background colors, locations, and overall dimensions of each sign.

C. Shop Drawings:

1. Include dimensions, locations, elevations, materials, text and graphic layout, attachment details, and schedules.

2. Schedule: Provide information sufficient to completely define each panel sign for fabrication, including room number, room name, other text to be applied, sign and letter sizes, fonts, and colors.

a. When room numbers to appear on signs differ from those on drawings, include the drawing room number on schedule.

b. When content of signs is indicated to be determined later, request such information from District through Architect at least 2 months prior to start of fabrication; upon request, submit preliminary schedule.

c. Submit for approval by District through Architect prior to fabrication.

D. Samples: Submit two samples of each type of sign, of size similar to that required for project, indicating sign style, font, and method of attachment.

E. Verification Samples: Submit samples showing colors, materials, and finishes specified.

F. Manufacturer's Installation Instructions: Include installation templates and attachment devices.

G. Manufacturer's qualification statement.

H. Maintenance Materials: Furnish the following for District's use in maintenance of project.

1. See Section 01 60 00 - Product Requirements for additional provisions.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Package signs as required to prevent damage before installation.

B. Package room and door signs in sequential order of installation, labeled by floor or building.

C. Store under cover and elevated above grade.

D. Store tape adhesive at normal room temperature.

1.06 FIELD CONDITIONS

A. Do not install tape adhesive when ambient temperature is lower than recommended by manufacturer.

B. Maintain minimum ambient temperature during and after installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Panel Signage:

1. ASI Sign Systems, Inc.: www.asisignage.com.
2. Best Sign Systems, Inc: www.bestsigns.com/#sle.
3. FASTSIGNS International, Inc: www.fastsigns.com/#sle.
4. Inpro Corporation: www.inprocorp.com/#sle.
5. Mohawk Sign Systems, Inc: www.mohawksign.com/#sle.
6. Seton Identification Products: www.seton.com/aec/#sle.
7. Or Equal Substitutions: See Section 01 60 00 - Product Requirements.

2.02 REGULATORY REQUIREMENTS

A. Accessibility Requirements: Comply with ADA Standards, CBC Chapter 11B, and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most restrictive requirements.

1. Requirements for Accessibility : Provide identifying devices meeting the requirements for persons with the following codes:
   a. California Building Code (CBC) Title 24, Part 2; Chapter 11B, Accessibility.
   b. Code of Federal Regulations 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities.
   c. Accessible Means of Egress Signage: CBC 1009.
      1) Directional Signage: CBC 1009.10.

(a) Provide directional signage complying with CBC Section 11B-703.5 indicating the location of all other means of egress and which are accessible means of egress:

(1) At exits serving a required accessible space but not providing an approved accessible means of egress.

2. Raised characters: Comply with CBC Section 11B-703.2.

a. Depth: Raised characters shall be raised 1/32 inch (0.8 mm) minimum above their background, shall be sans serif uppercase letters, and shall be duplicated in Braille.

b. Height: Raised character height shall be 5/8 inch (15.9 mm) minimum and 2 inches (51 mm) maximum based on the height of the uppercase letter "I". CBC Section 11B-703.2.5

c. Proportions: Raised Character proportions shall be selected from fonts where the width of the uppercase letter "O" is 60% minimum and 110% maximum of the height of the uppercase letter "I". Stroke thickness of the uppercase letter "I" shall be 15% maximum of the height of the character. CBC Sections 11B-703.2.4 and 11B-703.2.6

d. Character Spacing: Spacing between individual raised characters shall comply with CBC Section 11B-703.2.7

e. Line Spacing: Spacing between separate lines of raised characters shall comply with CBC Section 11B-703.2.8

f. Format: Raised character text shall be in a horizontal format. CBC Section 11B-703.2.9

g. Braille: Braille shall be contracted (Grade 2) and shall comply with CBC Sections 11B-703.3 and 11B-703.4. Braille dots shall have a domed or rounded shape and shall comply with CBC Table and Figure 11B-703.3.1.

h. Mounting Height: Tactile characters on signs shall be located 48" minimum to the baseline of the lowest Braille cells and 60" maximum to the baseline of the highest line of raised characters above the finish floor or ground surface. CBC Section and Figure 11B-703.4.1

i. Mounting Location: Tactile signs shall be located per CBC Section and Figure 11B - 703.4.2 as follows:

1) alongside a single door at the latch side.

2) on the inactive leaf at double doors with one active leaf.

3) to the right of the right hand door at double doors with two active leafs.

4) on the nearest adjacent wall where there is no wall space at the latch side of a single door or at the right side of double doors with two active leafs.

5) so that a clear floor space of 18" x18" minimum, centered on the tactile characters, is provided beyond the arc of any door swing between the closed position and 45 degree open position.

j. Visual Characters shall comply with CBC Section 11B-703.5:

1) Mounting Height: Visual characters on signs shall be 40" minimum above finish floor or ground.

2) Finish and Contrast: Characters and their background shall have a non-glare finish. Character shall contrast with their background with either light characters on a dark background or dark characters on a light background. CBC Section 11B-703.5.1

3) Height: Character height shall be determined based upon height above ground and horizontal viewing distance per CBC Table 11B-703.5.5.

4) Proportions: Visual Character proportions shall be selected from fonts where the width of the uppercase letter "O" is 60 % minimum and 110 % maximum of the height of the uppercase letter "I". Stroke thickness shall be 10% minimum and 20% maximum of the height of the character. CBC Sections 11B-703.5.4 and 11B-703.5.7.

5) Character Spacing: Spacing between individual adjacent characters shall be 10% min. and 35% max of character height per CBC Section 11B-703.5.8.

6) Line Spacing: Spacing between separate lines of characters within a message shall comply with CBC Section 11B-703.5.9

k. Pictograms shall comply with CBC Section 11B-703.6.

l. Symbols of accessibility shall comply with CBC Section 11B-703.7.

m. Variable message signs shall comply with CBC Section 11B-703.8.

3. Visual characters shall comply with CBC Section 11B -703.5 and shall be 40 inches minimum above finish floor or ground.

a. Characters and their background shall have a non-glare finish. Character shall contrast with their background with either light characters on a dark background or dark characters on a light background. CBC Section 11B-703.5.1

b. Character height shall be determined based upon height above ground and horizontal viewing distance per CBC Table 11B-703.5.5.

c. Proportions for Visual Characters shall be selected from fonts where the width of the uppercase letter "O" is 60 % minimum and 110 % maximum of the height of the uppercase letter "I". Stroke thickness shall be 10% minimum and 20% maximum of the height of the character. CBC Sections 11B-703.5.4 and 11B-703.5.7

d. Spacing between separate lines of characters shall comply with CBC Section 11B-703.5.9.

e. Character Spacing between individual adjacent characters shall be 10% minimum and 35% maximum of character height per CBC Section 11B-703.5.8.

4. Pictograms shall comply with CBC Section 11B-703.6.

5. Symbol of accessibility shall comply with CBC Section 11B-703.7.

6. Variable message signs shall comply with CBC Section 11B-703.8.

2.03 PANEL SIGNAGE

A. Panel Signage:

1. Application: Room and door signs.

2. Description: Flat signs with photopolymer plastic panel media, tactile characters.

3. Sign Size: As indicated on drawings.
4. Total Thickness: 1/8 inch.
5. Sign Edges: Squared.
6. Letter Edges: Squared.
7. Corners: Squared.
8. Color and Font, unless otherwise indicated:
    a. Character Font: Helvetica, Arial, or other sans serif font.
    b. Character Case: Upper and lower case (title case).
    c. Background Color: As scheduled.
    d. Character Color: Contrasting color.
9. Material: Laminated-Sheet Sign, Photopolymer face sheet with raised graphics laminated over subsurface graphics to acrylic or phenolic backing sheet to produce composite sheet.
10. Profile: Flat panel in aluminum frame.
    a. Frame Finish: Black anodized.
11. Tactile Letters: Raised 1/32 inch minimum.
12. Braille: Grade II, ADA-compliant.
13. One-Sided Wall Mounting: Concealed screws.

2.04 SIGNAGE APPLICATIONS

A. Room and Door Signs:

1. Rest Rooms: Identify with pictograms, the names "MEN" and "WOMEN", room numbers to be determined later, and braille.
    a. Identify all single user toilet facilities as gender neutral facilities by a door symbol that complies with CBC Section 11B-216.8 and 11B-703.7.2.6.3.
        1) No pictogram, text, or braille is required.
        2) Tactile jamb signage shall comply with appropriate technical requirements of CBC Section 11B-703.
            (a) Examples of appropriate designations are "ALL-GENDER RESTROOM", "RESTROOM", or "UNISEX RESTROOM". DSA BU-17-01.
            (b) Provide "RESTROOM" as the signage text, unless indicated otherwise on Drawings.
        3) See Drawings for actual sign to be provided.
    b. Geometric Symbols: The symbol color shall contrast with door or wall.
        1) Comply with CBC Section 11BCBC Ch. 11B-216.8.1 at the entrances to toilet and bathing rooms.
        2) Comply with CBC Section 11B-703.7.2.6.
            (a) Men’s: An equilateral triangle, ¼ inch thick edges with edges 12 inches long and a vertex pointing upward.

(b) Women's: A circle, ¼ inch thick and 12 inches in diameter.

(c) Unisex (All Gender): A circle, ¼ inch thick and 12 inches in diameter with a equilateral triangle, ¼ inch thick edges with edges 12 inches long and a vertex pointing upward, superimposed on and geometrically inscribed within the circle and within the 12 inch diameter. The vertex of the triangle shall be located ¼ inch maximum from the edge of the circle. The triangle shall contrast with the circle symbol, either light on a dark background or dark on a light background. The circle symbol shall contrast with the door.

(1) No pictogram is to be provided.

(d) Mount within 1 inch of the centerline of the door at minimum 58 inches and 60 inches maximum from the centerline of the symbol to the finished floor surface.

2. Exits: Provide raised character and Braille exit signs per CBC Section 1013.4 at the following locations:

Text	**Location**
EXIT	Grade level exit door.
EXIT STAIR DOWN, EXIT STAIR UP	Exit door to exit stair.
EXIT RAMP DOWN, EXIT RAMP UP	Exit door to exit ramp.
EXIT ROUTE	Exit door to exit enclosure, exit passageway, exit corridor, or exit hallway.
TO EXIT	Exit door to horizontal exit.
EXIT WITH ALARM	Exit doors with an alarm.
EXIT ONLY or EXIT STAIR ONLY	Exit doors and stair exit doors which lock from outside and does not allow a return

B. Interior Directional and Informational Panel Signs:

1. Assistive Listening Devices, include International Symbol of Access for Hearing Loss complying with CBC Section 11B Figure 11B-703.7.2.4..

a. Include International Symbol of Access for Hearing Loss, CBC Section 11B Figure 11B-703.7.2.4, with text "Assistive-Listening System Available". Use upper and lower case characters.

2. Stairway or Ramp Identification Signage: CBC Section 1023.9.

a. Size: 18 by 12 inches.

b. Content: Identify stair or ramp designation. Provide symbols, character size and stroke per CBC Section 1023.9.1.

2.05 FABRICATION

A. Provide signs and supports factory-prefabricated and pre-finished, ready for assembly and installation.

2.06 ACCESSORIES

A. Concealed Screws: Noncorroding metal; stainless steel, galvanized steel, chrome plated, or other.

B. Exposed Screws: Stainless steel.

C. Tape Adhesive: Double-sided tape, permanent adhesive.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are ready to receive work.

B. Notify Architect if conditions are not suitable for installation of signs; do not proceed until conditions are satisfactory.

3.02 INSTALLATION AT BUILDING

A. Install in accordance with manufacturer's instructions.

B. Install with horizontal edges level.

C. Locate panel signs and mount at heights indicated on drawings and in accordance with ADA Standards, CBC Chapter 11B, and applicable building codes.

1. Room and Door Signs: Locate on wall at latch side of door (per CBC Section 11B-703.4.2) a minimum of 48 inches to the baseline of the lowest braille cells; with baseline of highest line of raised character text at maximum 60 inches above finished floor.

    a. Comply with CBC Section 11B-703.4.1 and CBC Ch. 11B11B -703.4.2

D. Protect from damage until final inspection; repair or replace damaged items.

3.03 FIELD QUALITY CONTROL

A. Inspect signs for information content, appearance, location and Braille per as noted in Section 01 45 33 - Code-Required Special Inspections and Procedures.

B. Inspect signs for information content, appearance, location and Braille:

1. Prior to issuance of a final Certificate of Occupancy, Enforcing Agency shall verify installation of signs for information content, appearance, location and Braille per CBC Section 11B-703.1.1.2.

    a. Inspection includes, but not limited to:

        1) Braille dots and cells are properly spaced and the size proportion and type raised characters are in compliance with these regulations.

        2) Sanitary facilities signage per CBC Section 11B-216.8 Toilet rooms and bathing rooms; and CBC Section 11B-703.7.2.6 Toilet and bathing facilities geometric symbols.

        3) Tactile exit signage per CBC 1013.4 and CBC Section 11B-216.4.1 Exit doors.

3.04 ADJUST AND CLEAN

A. Repair damage to signs incurred during installation. Replace signs which cannot be repaired to new condition. Clean glass, frames, and other sign surfaces, adjust hardware for proper operation.

END OF SECTION

SECTION 10 21 13.19
PLASTIC TOILET COMPARTMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Solid plastic toilet compartments.

1.02 RELATED REQUIREMENTS

A. Section 10 28 00 - Toilet Accessories.

1.03 REFERENCE STANDARDS

A. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines.

B. ADA Standards - 2010 ADA Standards for Accessible Design.

C. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.

D. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.

E. ASTM A743/A743M - Standard Specification for Castings, Iron-Chromium, Iron-Chromium-Nickel, Corrosion Resistant, for General Application.

F. ASTM B26/B26M - Standard Specification for Aluminum-Alloy Sand Castings.

G. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

H. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric).

I. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

J. CBC Ch. 11B - California Building Code-Chapter 11B.

K. ICC (IBC) - International Building Code.

L. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate work with placement of support framing and anchors in walls and ceilings.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data on panel construction, hardware, and accessories.

C. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall, floor, and ceiling supports, and door swings.

D. Samples: Two sample blocks, 6 by 6 inches in size, illustrating partition panel finish, color, and sheen.

E. Manufacturer's Instructions: Indicate special procedures and perimeter conditions requiring special attention.

F. Manufacturer's qualification statement.

G. Executed warranty.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with minimum 3 years of documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

A. See Section 01 74 19 - Construction Waste Management and Disposal for packaging waste requirements.

B. Deliver, store, and handle materials and products in accordance with manufacturer's instructions and recommendations and industry standards.

C. Do not deliver materials or begin installation until building is enclosed, with complete protection from outside weather, and building temperature maintained at minimum of 60 degrees F.

D. Store products indoors in manufacturer's or fabricator's original containers and packaging, with labels clearly identifying product name and manufacturer. Protect products from damage.

E. Lay cartons flat; support to ensure flatness and prevent damage to prefinished surfaces.

F. Do not store where ambient temperature exceeds 120 degrees F.

1.08 FIELD CONDITIONS

A. Ambient Conditions: Maintain environmental conditions, such as temperature, humidity, and ventilation, within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.09 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Manufacturer Warranty: Provide 15-year manufacturer warranty for material against breakage, corrosion, and delamination. Complete forms in District's name and register with manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Solid Plastic Toilet Compartments:

1. Basis of Design Product: Hiny Hiders Partitions as manufactured by Scranton Products, www.scrantonproducts.com/#sle, or approved equal.
2. ASI Accurate Partitions: www.asi-accuratepartitions.com/#sle.
3. ASI Global Partitions: www.asi-globalpartitions.com/#sle.
4. Bobrick Washroom Equipment, Inc.: www.bobrick.com.
5. Bradley Corporation: www.bradleycorp.com.
6. Scranton Products: www.scrantonproducts.com/#sle.
7. Substitutions: Section 01 60 00 - Product Requirements.

2.02 DESIGN CRITERIA

A. Accessibility: Comply with CBC Ch. 11B and ADA Standards.

1. Installation shall meet accessibility requirements of the California Code of Regulations (CCR) Title 24 Part 2 and latest amendments to the ADA Standards and 36 CFR 1191.
2. California Building Code (CBC) accessibility regulations.
    a. Wheelchair accessible compartment shall comply with CBC CBC Ch. 11B-604.8.1.
    b. Toe clearance for at least one side partition of a wheelchair accessible compartment shall comply with CBC Section and Figure 11B-604.8.1.4. Toe clearance shall be 9 inches high minimum above the finish floor and 6 inches deep minimum beyond the compartment side face of the partition, exclusive of partition support members. It shall be 12 inches high minimum above the finish floor for children's use. Partition components at toe clearances shall be smooth without sharp edges or abrasive surfaces. Toe clearance at the side partition is not required in a compartment greater than 66 inches wide. required compartment area. CBC Section 11B-604.8.2.2
    c. Ambulatory accessible compartments shall be provided where there are six or more toilet compartments, or where the combination of urinals and water closets totals six or more fixtures. Such compartments shall be provided in the same quantity as wheelchair accessible compartments per CBC Section 11B-213.3.1 and shall comply with CBC Section 11B-604.8.2.
    d. Door and door hardware for accessible compartments shall be self-closing and shall comply with CBC Section 11B-404 except that if the approach is to the latch side of an ambulatory compartment door, clearance between the door side of the compartment and any obstruction shall be 44 inches minimum. CBC Figure 11B-604.8.2.
    e. A door pull complying with CBC Section 11B-404.2.7 shall be placed on both sides of the accessible compartment door near the latch.
    f. Ambulatory Accessible Toilet Compartment doors shall not swing into the clear floor space or clearance required for any fixture or into the minimum required compartment area. CBC Section 11B-604.8.2.2

B. Fire Performance: Pass when tested in accordance with NFPA 286.

1. Code compliance with CBC 803.1.1.1 and 803.9 must be verified prior to use and compliant with NFPA 286.

C. Surface Burning Characteristics: Flame spread index of 26 to 75 and smoke developed index of 450 or less, when tested in accordance with ASTM E84.

2.03 SOLID PLASTIC TOILET COMPARTMENTS

A. General Description: Factory-fabricated doors, pilasters, and divider panels made of solid, molded, high-density polyethylene (HDPE); floor-mounted, headrail-braced.

1. Privacy Style Partitions: No sightlines with gap-free interlocking doors and stiles routed 0.3 inch nominal from the edge to allow for 0.175 inch nominal overlap to prevent line-of-sight into the toilet compartment.

a. Privacy strips fastened or adhered onto the partition material are not acceptable.

B. Color: As selected by Architect.

C. Doors:

1. Thickness: 1 inch.
2. Width: 24 inches.
3. Width for Accessible Use: 36 inches.
4. Height: 72 inches.

D. Panels:

1. Thickness: 1 inch.
2. Height: 72 inches.

a. In restrooms designated for elementary school children, provide 12 inch high foot clearance at accessible toilet stalls.

b. In restrooms designated for adults, provide 9 inch high foot clearance at accessible toilet stalls.

c. At non-accessible stalls, provide 4-1/2 inches (privacy)

3. Depth: As indicated on drawings.

E. Pilasters:

1. Thickness: 1 inch.
2. Width: As required to fit space; minimum 3 inches.
3. Height: 82 inches standard.

2.04 FABRICATION

A. Fabricate toilet compartment components to sizes indicated in shop drawings.

B. Coordinate requirements and provide cutouts for through-partition toilet accessories.

C. Provide shoes and caps at pilasters and posts to conceal anchorage, supports, and leveling mechanisms.

D. Provide manufacturer's standard corrosion-resistant supports, leveling mechanisms, anchors, and anchoring assemblies for pilasters and posts.

E. Floor-Anchored, Overhead-Braced Units: Provide supports, leveling mechanisms, and anchors at pilasters to suit floor conditions.

2.05 MATERIALS

A. Aluminum Castings: ASTM B26/B26M.

B. Aluminum Extrusions: ASTM B221 (ASTM B221M).

C. High-Density Polyethylene (HDPE):

1. Composition: Formed from waterproof, nonabsorbent, HDPE resins.

2. Properties: Mark-resistant, self-lubricating surface.

3. Material Fire Ratings: ICC (IBC), Class B.

D. Stainless Steel Sheet, Plate, and Bar: ASTM A240/A240M or ASTM A666/A666M, Type 304, stretcher-leveled standard of flatness.

E. Stainless Steel Castings: ASTM A743/A743M.

2.06 ACCESSORIES

A. Pilaster Shoes: Stainless steel, satin finish, 3 inches high; concealing floor fastenings.

1. Provide adjustment for floor variations with screw jack through steel saddles integral with pilaster.

B. Headrails: Extruded aluminum, anti-grip profile.

1. Size: Manufacturer's standard size.

C. Wall and Pilaster Brackets: Stainless steel; continuous type.

D. Attachments, Screws, and Bolts: Stainless steel, tamper-proof type.

1. Bracket Attachment to Panels and Pilasters: Through-bolts and nuts; tamper proof.

E. Hinges: Stainless steel, manufacturer's standard finish.

1. Continuous-type hinge, self-closing.

F. Steel Plate Reinforcement: Carbon steel, prepared for fasteners, 1/8 inch thick.

G. Door Hardware: Stainless steel, manufacturer's standard finish.

1. Door Latch: Slide type with exterior emergency access feature.

2. Door Strike and Keeper with Rubber Bumper: Mount on pilaster in alignment with door latch.

3. Provide door pull for outswinging doors.

a. Provide second CBC Ch. 11B and ADA Standards door pull for outswinging doors at accessible doors.

1) Surface mounted U-shaped or wire pulls on both sides of accessible compartment doors.

2) Chrome Plated Double Door Pull 5-1/2", for 1 inch thick doors.

3) Overall width is 6-3/4 inches with 5-7/8 inch hole spacing.

H. Coat Hook: One per compartment, mounted on door.

1. Mount such that no portion is over 40 inches above finish floor , at accessible stall, and 48 inches above finish floor at non-accessible stall.

I. Toilet Accessories: See Section 10 28 00.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify dimensions, tolerances, and interfaces with other work.

B. Verify actual locations of toilet fixtures, walls, columns, ceilings, and other construction contiguous with toilet compartments by field measurements before fabrication.

C. Verify spacing of and between plumbing fixtures.

D. Verify location of built-in framing, anchorage, and bracing.

E. Verify substrate and site conditions for product installation are installed in accordance with manufacturer's written instructions.

F. Notify Architect in writing of conditions detrimental to completion of work. Do not proceed with installation until detrimental conditions are corrected.

3.02 INSTALLATION

A. Install partitions secure, rigid, plumb, and level in accordance with manufacturer's written instructions.

B. Maintain 3/8-to-1/2-inch space between wall and panels and between wall and end pilasters.

C. Attach panel brackets securely to walls using anchor devices.

D. Attach panels and pilasters to brackets. Locate headrail joints at pilaster center lines.

E. Replace damaged or scratched materials with new materials. Do not touch up scratches or damaged finish in field.

3.03 TOLERANCES

A. Alignment Tolerance: Plus or minus 1/16 inch, in any direction.

B. Maximum Variation from True Position: 1/4 inch.

C. Maximum Variation from Plumb: 1/8 inch.

3.04 ADJUSTING

A. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 inch.

B. Adjust hinges to position doors in partially open position when unlatched. Return outswinging doors to closed position.

1. Adjust doors to remain open at approximately 30 degrees.

C. Adjust adjacent components for consistency of line or plane.

END OF SECTION

SECTION 10 28 00
TOILET ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Commercial toilet accessories.

B. Under-lavatory pipe supply covers.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Concealed supports for accessories, including in wall framing and plates.

B. Section 10 21 13.19 - Plastic Toilet Compartments.

C. Division 22 - Plumbing: Under-lavatory pipe and supply covers.

1.03 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design.

B. ASME A112.18.9 - Protectors/Insulators for Exposed Waste and Supplies on Accessible Fixtures.

C. ASTM A269/A269M - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.

D. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.

E. ASTM B456 - Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.

F. ASTM C1036 - Standard Specification for Flat Glass.

G. ASTM C1503 - Standard Specification for Silvered Flat Glass Mirror.

H. ASTM C1822 - Standard Specification for Insulating Covers on Accessible Lavatory Piping.

I. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

J. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.

K. CBC Chapter 11B - California Building Code-Chapter 11B.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the work with the placement of internal wall reinforcement, concealed ceiling supports, and reinforcement of toilet partitions to receive anchor attachments.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Submit data on accessories describing size, finish, details of function, and attachment methods.

C. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention.

1.06 QUALITY CONTROL

A. Regulatory Requirements:

1. Provide toilet accessories meeting the requirements for the persons with disabilities of the California Building Code (CBC), Title 24 Part 2, CBC Chapter 11B, andADA Standards, as amended.
    a. Elements of Sanitary facilities shall be mounted at locations in compliance with CBC Sections 11B-602 through 11B-612.
    b. Grab bars in toilet facilities and bathing facilities shall comply with CBC Section 11B-609. Grab bars and any wall or other surfaces adjacent to grab bars shall be free of sharp or abrasive elements and shall have rounded edges. The space around the grab bars shall be as follows:
        1) 1-1/2 inches between the grab bar and the wall.
        2) 1-1/2 inches minimum between the grab bar and projecting objects below and at the ends.
        3) 12 inches 12” minimum between the grab bar and projecting objects above.
2. Accessible requirements:
    a. Toilet accessories required to be accessible shall be mounted with any operable part at maximum 40 inches above the finish floor and 36 inches maximum in restrooms designated for use by children ages 3-4. CBC Section 11B-308.4 & 11B-603.5.
    b. Toilet tissue dispensers are to be continuous flow type. CBC Section 11B-604.7.1.
    c. Toilet paper and feminine napkin disposals located on the grab bar side of the accessible toilet room or stall shall not project more than the grab bar or 3 inches from the finished wall surface nor be located closer than 1-1/2 inches clear of the tangent point of the grab bar. (Legacy DSA Interpretation.)
        1) Accessories surface mounted above grab bar will restrict usability.
    d. All other accessories shall not project more than 4 inches from wall surface, but cannot encroach into any required clear space.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Commercial Accessories:

1. American Specialties, Inc: www.americanspecialties.com/#sle.
2. Bobrick Washroom Equipment, Inc.: www.bobrick.com.
3. Bradley Corporation: www.bradleycorp.com/#sle.
4. Kimberly-Clark Corporation: www.kcprofessional.com/#sle.

5. Substitutions: Section 01 60 00 - Product Requirements.

2.02 MATERIALS

A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
   1. Grind welded joints smooth.
   2. Fabricate units made of metal sheet of seamless sheets with flat surfaces.

B. Keys: Provide Two keys for each accessory to District; master key lockable accessories.

C. Stainless Steel Sheet: ASTM A666/A666M, Type 304.

D. Stainless Steel Tubing: ASTM A269/A269M, Grade TP304 or TP316.

E. Mirror Glass: Annealed float glass, ASTM C1036 Type I, Class 1, Quality Q2, with silvering, protective and physical characteristics complying with ASTM C1503.

F. Adhesive: Two component epoxy type, waterproof.

G. Fasteners, Screws, and Bolts: Hot dip galvanized; tamper-proof; security type.

H. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

2.03 FINISHES

A. Stainless Steel: Satin finish, unless otherwise noted.

B. Chrome/Nickel Plating: ASTM B456, SC 2, polished finish, unless otherwise noted.

2.04 COMMERCIAL TOILET ACCESSORIES

A. Toilet Paper Dispenser: Roll-in-reserve type, designed to allow automatic activation of reserve roll when needed, or manual activation by pressing release bar, , stainless steel unit with pivot hinge, tumbler lock.
   1. Products: See schedule on Drawings
      a. Substitutions: Section 01 60 00 - Product Requirements.

B. Combination Towel Dispenser/Waste Receptacle: Recessed flush with wall, stainless steel; seamless wall flanges, continuous piano hinges, tumbler locks on upper and lower doors.
   1. Waste receptacle liner: Reusable, heavy-duty vinyl.
   2. Towel dispenser capacity: 400 C-fold.hook
   3. Waste receptacle capacity: 4 gallons.
   4. Products: See schedule on Drawings
      a. Substitutions: Section 01 60 00 - Product Requirements.

C. Soap Dispenser: Liquid soap dispenser, wall-mounted, , with stainless steel cover and stainless steel tank and working parts; push type soap valve, check valve, and window gauge refill indicator, tumbler lock.
   1. Minimum Capacity: 40 ounces.
   2. Products: See schedule on Drawings

D. Mirrors: Stainless steel framed, 1/4 inch thick annealed float glass; ASTM C1036.

1. Annealed Float Glass: Silvering, protective and physical characteristics in compliance with ASTM C1503.
2. Frame: 0.05 inchangle shapes, with mitered and welded and ground corners, and tamperproof hanging system; satin finish.
3. Backing: Full-mirror sized, minimum 0.03 inch galvanized steel sheet and nonabsorptive filler material.
4. Products: See schedule on Drawings

E. Seat Cover Dispenser: Stainless steel, surface-mounted, reloading by concealed opening at base, tumbler lock.

1. Minimum capacity: 250 seat covers.
2. Products: See schedule on Drawings

F. Grab Bars: Stainless steel, peened surface.

1. Standard Duty Grab Bars:
   a. Push and Pull Point Load: Minimum 250 lbf.
   b. Dimensions: 1-1/2 inch outside diameter, minimum 0.05 inch wall thickness, exposed flange mounting, 1-1/2 inch clearance between wall and inside of grab bar.
   c. Finish: Satin.
   d. Length and Configuration: As indicated on drawings.
   e. Products: See schedule on Drawings

G. Sanitary Napkin Disposal Unit: Stainless steel, , self-closing door, locking bottom panel with full-length stainless steel piano-type hinge, removable receptacle.

1. Products: See schedule on Drawings

2.05 UNDER-LAVATORY PIPE AND SUPPLY COVERS

A. Under-Lavatory Pipe and Supply Covers:

1. Insulate exposed drainage piping, including hot, cold, and tempered water supplies under lavatories or sinks to comply with ADA Standards.
2. Exterior Surfaces: Smooth non-absorbent, non-abrasive surfaces.
3. Construction: 1/8 inch flexible PVC.
   a. Surface Burning Characteristics: Flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.
   b. Comply with ASTM C1822, type indicated.
   c. Comply with ASME A112.18.9.
   d. Comply with ADA Standards and CBC Chapter 11B.
   e. Microbial and Fungal Resistance: Comply with ASTM G21.
4. Color: White.
5. Fasteners: Reusable, snap-locking fasteners with no sharp or abrasive external surfaces.

6. Products: See schedule on Drawings
    a. Basis of Design Product: For accessibility at lavatories: LavGuard2 as manufactured by Truebro, Inc., or approved equal.
    b. Basis of Design Product: For accessibility at counter sinks: BasinGuard, UL Listing MH25426 as manufactured by Truebro, Inc., or approved equal.
    c. Bobrick Washroom Equipment, Inc.; www.bobrick.com.
    d. Bradley Corporation : www.bradleycorp.com.
    e. IPS Corporation Lav Guard 2 Undersink Pipe Covers: www.ipscorp.com.
    f. IPS Corporation TrueBro Lav Shield: www.ipscorp.com.
    g. Substitutions: See Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify exact location of accessories for installation.

C. For electrically-operated accessories, verify that electrical power connections are ready and in the correct locations.

D. Verify that field measurements are as indicated on drawings.

E. See Drawings for installation of blocking, reinforcing plates, and concealed anchors in walls and ceilings.

3.02 PREPARATION

A. Deliver inserts and rough-in frames to site for timely installation.

B. Provide templates and rough-in measurements as required.

3.03 INSTALLATION

A. Install accessories in accordance with manufacturers' instructions in locations indicated on drawings.

B. Install plumb and level, securely and rigidly anchored to substrate.

C. Mounting Heights: As required by accessibility regulations, unless otherwise indicated.
    1. Grab Bars: As indicated on drawings.
        a. Adult mounting height to be between minimum 33 inches to maximum 36 inches to top tangent point. CBC Section 11B-609.4 Position of Grab Bars.
    2. Mirrors: 40 inch, measured from floor to bottom of mirrored surface.
    3. Seat Cover Dispenser:
        a. Shall not be located closer than 1-1/2 inches clear of the tangent point of the grab bar.
        b. If surface mounted and located under the grab bar provide a minimum 5 inches clear under unit for refilling.

4. Other Accessories: As indicated on drawings.

3.04 PROTECTION

A. Protect installed accessories from damage due to subsequent construction operations.

END OF SECTION

SECTION 10 73 16.13
METAL CANOPIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Freestanding metal canopies.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Concrete footings.

B. Section 09 91 13 - Exterior Painting: Finish coating.

1.03 REFERENCE STANDARDS

A. AISC 303 - Code of Standard Practice for Steel Buildings and Bridges.

B. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures.

C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.

D. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength.

E. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.

F. ASTM A572/A572M - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.

G. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

H. ASTM A924/A924M - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.

I. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).

J. ASTM E2950 - Standard Specification for Metal Canopy Systems.

K. ASTM F593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.

L. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi, 144 ksi, and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength.

M. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification.

N. AWS D1.1/D1.1M - Structural Welding Code - Steel.

O. ITS (DIR) - Directory of Listed Products.

P. NFPA 70 - National Electrical Code.

Q. UL (DIR) - Online Certifications Directory.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Submit product data sheets, including material descriptions and finishes, and preparation instructions and recommendations.

C. Shop Drawings: Prior to commencement of fabrication, submit detailed shop drawings, showing profiles, sections of components, finishes, and fastening details.

D. Design Data: Submit comprehensive structural analysis of design for the specified loads. Stamp and sign calculations by professional engineer.

E. Manufacturer's Qualification Statement.

F. Erector's Qualification Statement.

G. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.

H. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in District's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Perform steel work in accordance with AISC 303.

1. Maintain one copy on site.

B. Manufacturer Qualifications: Company specializing in the manufacture of products similar to those required for this project.

1. Not less than three years of documented experience.

C. Erector Qualifications: Company specializing in performing the work of this section.

1. Not less than three years of documented experience and approved by canopy manufacturer.

D. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and no more than 12 months before start of scheduled welding work.

1.06 DELIVERY, STORAGE, AND HANDLING

A. See Section 01 74 19 - Construction Waste Management and Disposal for packaging waste requirements.

B. Deliver materials to project site ready for erection.

C. Package using methods that prevent damage during shipping and storage on site.

D. Store materials under cover and elevated above grade.

1.07 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Metal Canopies: Correct defective work within a two year period after Date of Substantial Completion.

C. Finish Warranty: Provide manufacturer's one year warranty on factory finish against cracking, peeling, and blistering.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Metal Canopies:

1. Basis of Design Product: Pre-Engineered Canopy, indicated on Drawings as manufactured by M Bar C Construction, Inc., or approved equal.

    a. DSA Pre-Approved.

2.02 METAL CANOPIES

A. Shop Fabricated Metal Canopy

1. Pre-engineered steel system complying with ASTM E2950.

B. Configuration: Layout and dimensions, column layout, canopy clearance, fascia profile, and roof covering design as indicated on drawings.

1. Installation: Freestanding.
2. Column Anchorage: Column baseplates installed with anchor bolts or expansion anchors into concrete footing, slab, or pier.
3. Structural Framing System: Steel.
4. Covering Material: Steel.
5. Drainage Concept: Water collected in decking conducted into perimeter drain beams and discharged through columns.

C. Performance Requirements:

1. Design and fabricate metal canopy system to resist wind, live, and seismic loads without failure, damage, or permanent deflection in accordance with ASCE 7:

    a. Loads: As indicated on drawings.

2. Thermal Movement: Design canopy system to accommodate thermal movement caused by ambient temperature range of 120 degrees F and surface temperature range of 180 degrees F without buckling, failure of joint seals, undue stress on fasteners or other detrimental effects on assembly components.
3. Electrical Components, Devices, and Accessories: Listed and labeled by ITS (DIR), UL (DIR), or testing agency acceptable to authorities having jurisdiction and installed in compliance with NFPA 70, and marked for intended application.

2.03 COMPONENTS

A. Structural Steel Framing:

1. Columns: ASTM A500/A500M, Grade B, round or rectangular tubing, sized to suit project design load requirements.
2. Base and Top Plates: ASTM A36/A36M, with pre-drilled bolt holes.
3. Beams: Wide flange, ASTM A572/A572M Grade 50.
4. Other Structural Steel Members: ASTM A36/A36M.

B. Covering:

1. Steel Decking: Interlocking panels.
    a. Panel Size: 16 inches wide by 3 inches deep; 20 gauge, 0.0359 inch thickness.
    b. Material: ASTM A653/A653M, G90 galvanized according to ASTM A924/A924M.
    c. Provide canopy manufacturer's standard clip type fasteners for attaching covering to structural beams.
2. Overhang: 4 inches.

C. Fascia: Manufacturer's standard flat profile.
1. Material: Galvanized steel panel laminated to 2 inch polystyrene foam core.

D. Anchor Bolts: ASTM A307 or ASTM A572/A572M, formed with bent shank, assembled with template for casting into concrete.
1. Minimum exposed thread of 7 inches above footing and 23 inch minimum embedment.
2. Provide nuts and washers as required for column leveling and plumbing.

E. Concrete Footings: Refer to Section 03 30 00 for additional requirements.

F. Exposed Gutters and Downspouts: Galvanized steel with baked enamel finish, color to match canopy covering, manufacturer's recommended size for canopy specified.

2.04 SHOP FABRICATION

A. Provide a complete system ready for erection at project site.

B. Shop fabricate to the greatest extent possible; disassemble if necessary for shipping.

C. Weld steel members in accordance with AWS D1.1/D1.1M.

D. Fabricate connections for bolt, nut, and washer connectors.

2.05 FINISHES

A. Structural Steel Framing:
1. Shop Primer: Rust-inhibitive red oxide.
2. Finish Coating: As specified in Section 09 91 13.

B. Steel Decking and Roofing: Polyester baked enamel finish; color as selected from manufacturer's standard range.

C. Fascia: Polyester baked enamel finish; color as selected from manufacturer's standard range.

2.06 ACCESSORIES

A. Structural Bolts: ASTM F3125/F3125M, Grade A325, minimum 3/4 inch diameter.

B. Trim, Closure Pieces, and Flashings: Same material, thickness and finish as sheet metal decking; factory-fabricated to required profiles.
1. Exposed Fasteners: Not permitted.

C. Grout: ASTM C1107/C1107M; non-shrinking; premixed compound consisting of non-metallic aggregate, cement, water-reducing and plasticizing agents.

D. Fasteners, Non-Structural: ASTM F593 stainless steel or ASTM A307 carbon steel.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates and site area for conditions that might prevent satisfactory installation.

B. Verify that foundation, electrical utilities, and placed anchors are in correct position.

C. Verify that bearing surfaces are ready to receive this work.

D. Do not proceed with installation until all conditions are satisfactory.

3.02 INSTALLATION - FRAMING

A. Erect framing in accordance with AISC 303.

B. Provide for erection and wind loads. Provide temporary bracing to maintain structure plumb and in alignment until completion of erection and installation.

C. Set column base plates with non-shrink grout to achieve full plate bearing.

D. Fasten columns to anchor bolts.

E. Do not field cut or alter structural members without approval.

F. After erection, prime welds, abrasions, and surfaces not shop primed.

3.03 INSTALLATION - CANOPY COVERING

A. Install in accordance with manufacturer's instructions.

B. Fasten metal decking to metal support members, aligned level and plumb.

C. Install fascia panels, trim, and flashing.

D. Separate dissimilar metals using concealed bituminous paint.

E. Touch-up damaged finish coating using material provided by manufacturer to match original coating.

3.04 TOLERANCES

A. Maximum Variation from Level: Plus/Minus 1/8 inch.

3.05 CLEANING

A. See Section 01 70 00 - Execution and Closeout Requirements for additional requirements.

B. Clean surfaces of dust and debris; follow manufacturer's cleaning instructions for the finish used.

3.06 PROTECTION

A. Protect canopy after installation to prevent damage due to other work until Date of Substantial Completion.

END OF SECTION

SECTION 11 68 13
PLAYGROUND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Playground layout and staking.

B. Concrete footings for playground equipment.

C. Playground equipment.

D. Location of each item of playground equipment is indicated on drawings.

1.02 SUMMARY

A. The District will contract with an independent vendor (Owner's Vendor) to install the playground equipment. This section is provided for reference purposes of the SIte Contractor.

B. It shall be the responsibility of the successful playground equipment contractor (Owner's Vendor) to provide all labor, materials, equipment and tools necessary for the complete installation of the equipment, as indicated on the plans and as specified herein. The installation of all materials shall be performed in strict accordance with the manufacturer's installation instructions and in accordance with all approved shop drawings.

C. (Owner's Vendor) to furnish all labor, materials, tools and equipment necessary to install equipment as indicated on the Drawings and as specified herein; including components and accessories required for a complete installation. including but not limited to:

1. Coordination with related trades to ensure a complete, integrated, and timely installation

D. Concrete footings required for the system shall be as detailed and recommended by the playground equipment manufacturer, and as approved by the District.

1. Supply and installation of these details will be under the scope of work of the base contractor, not that of the playground equipment installer.

1.03 RELATED REQUIREMENTS

A. Section 31 20 00 - Earthwork: Shaping subgrade to specified grade levels.

B. Section 32 18 16.13 - Playground Protective Surfacing: Protective surfacing in playground area.

1.04 DEFINITIONS

A. Play Event: A piece of playground equipment that supports one or more play activities.

B. Use Zone: Area under and around a play event within which the ground surfacing must meet fall impact attenuation requirements of ASTM F1292 when tested at the fall height specified for the play event.

C. Fall Height: Vertical distance between the finished elevation of the designated play surface and the finished elevation of the protective surfacing beneath it, as defined in ASTM F1487.

D. Protective Surfacing: Resilient ground surfacing, specified in Section 32 1816.13. The characteristics of the protective surfacing are based on the fall height of the playground equipment. Changes in either the surfacing or the fall height, particularly reducing the resilience of the protective surfacing or increasing the fall height, will reduce safety-related performance.

E. Subgrade: Surface of the ground on which the protective surfacing is installed; the subbase for the protective surfacing is installed over the subgrade.

1.05 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design.

B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

C. ASTM A135/A135M - Standard Specification for Electric-Resistance-Welded Steel Pipe.

D. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.

E. ASTM A513/A513M - Standard Specification for Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing.

F. ASTM B26/B26M - Standard Specification for Aluminum-Alloy Sand Castings.

G. ASTM B108/B108M - Standard Specification for Aluminum-Alloy Permanent Mold Castings.

H. ASTM B179 - Standard Specification for Aluminum Alloys in Ingot and Molten Forms for Castings from All Casting Processes.

I. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

J. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric).

K. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete.

L. ASTM D648 - Standard Test Method for Deflection Temperature of Plastics Under Flexural Load in the Edgewise Position.

M. ASTM D6662 - Standard Specification for Polyolefin-Based Plastic Lumber Decking Boards.

N. ASTM F1292 - Standard Specification for Impact Attenuation of Surfacing Materials Within the Use Zone of Playground Equipment.

O. ASTM F1487 - Standard Consumer Safety Performance Specification for Playground Equipment for Public Use.

P. AWPA U1 - Use Category System: User Specification for Treated Wood.

Q. CBC - California Building Code.

R. CBC Ch. 11B - California Building Code-Chapter 11B.

S. CPSC Pub. No. 325 - Public Playground Safety Handbook.

1.06 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meetings: Convene a meeting one week before starting earthwork for playground to discuss coordination between various installers.

1. Require attendance by personnel responsible for grading and installers of playground equipment, protective surfacing, footings, and adjacent work.
2. Include representatives of Contractor.
3. Notify Architect at least 2 weeks prior to meeting.

1.07 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Proposals for Substitutions: Substitutions that will increase fall height, platform height, or maximum equipment height will not be considered; submit shop drawings with proposed modifications clearly identified and sufficient information to determine compliance with specified criteria.

C. Product Data: For manufactured equipment, provide manufacturer's product data showing materials of construction, compliance with specified standards, installation procedures, safety limitations, and the number of users permitted.

1. Treated Wood Products: Provide information on wood treatment chemical content, toxicity level, and life-cycle durability.
2. Wood Finishes: Provide information on wood finish chemical content and toxicity level.
3. Certifications: Provide International Play Equipment Manufacturers Association (IPEMA) certification that product complies with ASTM F1487, excluding section 10 and 12.6.1.

D. Product Data: For fabricated items, provide the following:

1. Treated Wood Products: Provide information on wood treatment chemical content, toxicity level, and life-cycle durability.
2. Wood Finishes: Provide information on wood finish chemical content and toxicity level.
3. Galvanized Steel: Certification of galvanized coating thickness.

E. Shop Drawings: Detailed scale drawings showing play event layout, use zone perimeters, and fall height for each play event.

1. Show locations and dimensions of footings and anchorage points.
2. Clearly identify mounting elevations in relation to a fixed survey point on site and to subgrade elevation and depth of protective surfacing.
3. Show locations of underground utilities, storm drainage system and irrigation system.
4. Show locations of related construction such as walkways and roadways, fences, site furnishings, and plantings.

F. Samples: For each item that a color must be selected, provide color chart showing full range of colors and finishes.

G. Manufacturer's qualification statement.

H. Installer's qualification statement.

I. Maintenance Data: Provide manufacturer's recommended maintenance instructions and list of replaceable parts for each equipment item, with address and phone number of source of supply.

1. Contractor shall provide the District with two copies of complete manufacturer's installation instructions and maintenance kit. Subcontractor shall provide complete sets of installation and maintenance instructions directly to the Contractor for routing to the District.

J. Manufacturer's Field Report.

K. Executed warranty.

1.08 QUALITY ASSURANCE

A. Maintain one copy of the latest edition of ASTM F1487 and CPSC Pub. No. 325 at project site.

B. Manufacturer Qualifications: Company regularly engaged in manufacturing materials and products specified in this section, with at least three years of experience.

1. Provide documentation showing that playground equipment similar to that specified has been installed in at least ten sites and in successful service for at least five years; provide addresses.

2. Provide certificate of Insurance AA rated for minimum 1,000,000 dollars covering both product and general liability.

3. Manufacturer's Representative: Provide product rep's name, company name and address, and playground safety training certificate.

C. Installer Qualifications: Company certified by manufacturer for training and experience installing play events and equipment.

1. Installation crew leader shall be CPSI-certified.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Deliver, handle, and store equipment to project site in accordance with manufacturer's recommendations.

B. Store materials in a dry, covered area, elevated above grade.

1.10 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Provide minimum five year (plus additional years per material component) warranty for playground equipment. Complete forms in District's name and register with manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Playground Equipment:

1. Playworld Systems, Inc..

2. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 PLAYGROUND EQUIPMENT - GENERAL

A. Play Components and Structures:

1. Play areas along with number and types of play components shall comply with scoping requirements of CBC Section 11B-240.
2. Play areas with play components and structures provided comply with CBC Ch. 11B-1008 and ADA Standards.

B. Design Assumptions: Because the safety of the playground depends on strict compliance with design criteria, this information is provided for Contractor's information.

1. Playground has been designed for children ages 5 through 12.
2. If deviations from specified dimensions, especially fall heights, is required, obtain approval prior to proceeding; follow approval request procedure as specified for substitutions.

C. Mount equipment on concrete footings, unless otherwise indicated.

1. Playground protective surfacing constitutes a resilient layer installed over a subbase (non-resilient) that is installed over subgrade; top of footings and anchorage devices is to be covered by full depth of resilient portion of protective surfacing.
2. Protective Surfacing Depth: As indicated on drawings.
3. Provide supports as required to mount equipment at proper height above finish and sub-grades to allow installation of sufficient depth of protective surfacing; portion of support below top of surfacing must comply with specified requirements for equipment.
4. Paint portion of support that is intended to be installed below top surface of protective surfacing a different color, or mark in other permanent way, so that installers and maintainers of protective surfacing can easily determine whether sufficient depth has been installed.

D. Provide permanent label for each equipment item stating age group that equipment was designed for, manufacturer identification, and warning labels in accordance with ASTM F1487.

2.03 PLAYGROUND EQUIPMENT

A. Comply with ASTM F1487 and CPSC Pub. No. 325; provide equipment complying with specified requirements for relevant age group(s).

1. Provide components having factory-drilled holes; do not use components with extra holes that will not be filled by hardware or covered by other components.

B. Comply with CBC Section 424.

C. Play structure with multiple activities:

2.04 MATERIALS

A. Steel Pipe and Tube: Comply with ASTM A135/A135M, ASTM A500/A500M, or ASTM A513/A513M; hot-dipped galvanized and free of excess weld and spatter.

1. Tensile Strength: 45,000 psi, minimum.
2. Yield Point: 33,000 psi, minimum.

3. Galvanizing: Hot-dip metal components in zinc after fabrication, in accordance with ASTM A123/A123M; remove tailings and sharp protrusions and burnish edges.

B. Extruded Aluminum: ASTM B221 or ASTM B221M, Alloy 6061, 6062, or 6063.
   1. Tensile Strength: 38,000 psi, minimum.
   2. Yield Point: 35,000 psi, minimum.

C. Cast Aluminum: ASTM B26/B26M, ASTM B108/B108M, or ASTM B179.

D. Chain: Corrosion resistant zinc plated steel; minimum size 4/0; polyvinyl chloride (PVC) coating.

E. Rope Cable: Strands of steel cable with UV-stabilized polypropylene synthetic covering; ends capped to prevent fraying.

F. Hardware: Provide without hazardous protrusions, corners, or finishes, and that require tools for removal after installation; countersunk fasteners are preferred.
   1. Use stainless steel for metal-to-metal connections; select type to minimize galvanic corrosion of materials connected by hardware.
   2. Use stainless steel for wood-to-wood and wood-to-metal connections.
   3. Use stainless steel with plastic components.
   4. Bearings: Self lubricating.
   5. Hooks, Including S-Hooks: Closed loop; maximum gap 0.04 inches, less than the thickness of a dime.
   6. Rails, Loops, and Hand Bars: Same metal as item is mounted on or aluminum; with powder coating.
   7. Anchors: In accordance with manufacturer's recommendations.

G. Boards and Timbers: Free of holes, cracks, and loose knots; do not use wood or wood coatings that contain pesticides; do not utilize used lumber.
   1. Species: Western red cedar; preservative treatment for members within 6 inches above top surface of protective surfacing.
   2. Preservative Treatment: Pressure type in accordance with AWPA U1 Use Category 4A Commodity B; do not use chromated copper arsenate (CCA), creosote, pentachlorophenol, tributyl tin oxide, or any other treatment prohibited by law; treat cuts after fabrication using brushed-on preservative.

H. Plywood: Exterior grade, bonded with waterproof glue; suitable for painting.
   1. Thickness: Minimum 3/4 inch.
   2. Edges: Minimum radius 1/8 inch; sanded smooth; fill voids at edges with epoxy before sanding.
   3. Face Layer: Smooth, fine, tightly grained; free of knots, patches, surface irregularities.
   4. Exposed Surface: Material with high paint adhesion and retention properties.

I. Opaque Plastic: Molded homogeneous plastic or wood-polymer composite lumber; do not use plastic as major load bearing members; use as deck boards, panels, and railings is acceptable.

1. Homogeneous Plastic: Ultraviolet (UV) and color stabilized polyethylene without applied surface coating; color through entire thickness.
2. Wood-Polymer Composite Lumber: Comply with ASTM D6662; factory finished.
3. Decks and Platforms: Non-slip surface texture.
4. Maximum Deflection: 1/360 of span, when tested in accordance with ASTM D648, with a uniform live load of 40 pounds/ft.
5. Deck Board Span: 12 inches on center, maximum, spanning minimum of 3 joists.
6. Panel Thickness: 3/16 inch, minimum.
7. Panel Edges: 3/16 inch radius, minimum.

J. Powder Coating for Steel: Electrostatically applied and oven cured polyester powder over electrostatic zinc coating.

K. Polyvinyl Chloride (PVC) Coating: Ultraviolet (UV) stabilized and mold-resistant; slip-resistant finish; prime parts to be coated with clear acrylic thermosetting solution, and preheat prior to dipping in liquid PVC.
   1. Thickness: 0.08 inch, minimum, plus/minus 0.02 inch.

L. Concrete: ASTM C94/C94M ready mix concrete; 28 days strength of 3,000 psi.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that playground equipment footings have been installed in proper locations and at proper elevations.

B. Verify location of underground utilities and facilities in playground area; damage to underground utilities and facilities will be repaired at Contractor's expense.

3.02 PREPARATION

A. Stake location of playground elements, including Use Zone perimeters, perimeter of protective surfacing, access and egress points, hard surfaces, walls, fences, and structures, and planting locations.

B. Stake layout of entire Use Zone perimeter before starting any work and before subbase under resilient surfacing is laid.
   1. Verify that Use Zone perimeters do not overlap hard surfaces, whether currently installed or not.
   2. Verify that Use Zones are free of obstructions that would extend into resilient portion of protective surfacing.
   3. If conflicts or obstructions exist, notify Architect.
   4. Do not proceed until revised drawings have been provided, showing corrected layout, and obstructions have been removed.

3.03 INSTALLATION

A. Coordinate work with preparation for and installation of protective surfacing specified in Section 32 18 16.13; install resilient portion of protective surfacing after playground equipment installation.

B. Install concrete footings with top surface a minimum of 1/2 inch below required subgrade elevation.

C. Install in accordance with CPSC Pub. No. 325, ASTM F1487, manufacturer's instructions, and requirements of authorities having jurisdiction (AHJ).

D. Anchor equipment securely below bottom elevation of resilient surfacing layer.

E. Install without sharp points, edges or protrusions, entanglement hazards, pinch, crush, or shear points.

F. Do not modify play events on site without written approval of manufacturer.

G. Install required signage if not factory-installed.

3.04 FIELD QUALITY CONTROL

A. Obtain the services of the equipment manufacturer's field representative to review the finished installation for compliance with specified requirements and with design criteria to the extent known to the Contractor; submit report of field review.

B. District or District's representative will inspect playground equipment after installation to verify that playground meets specified design safety and accessibility requirements.

C. Repair or replace rejected work until compliance is achieved.

3.05 CLEANING

A. Restore adjacent existing areas that have been damaged from the construction.

B. Clean playground equipment of construction materials, dirt, stains, filings, and blemishes due to shipment or installation; clean in accordance with manufacturer's instructions, using cleaning agents as recommended by manufacturer.

C. Clean playground area of excess construction materials, debris, and waste.

D. Remove excess and waste material and dispose of off-site in accordance with requirements of authorities having jurisdiction (AHJ).

3.06 PROTECTION

A. Protect installed products until Date of Substantial Completion.

B. Replace damaged products before Date of Substantial Completion.

SCHEDULES

KINDER PLAY EQUIPMENT COMPONENT LIST

A. See Drawings for Schedule

END OF SECTION

SECTION 12 36 00
COUNTERTOPS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Countertops for architectural cabinetwork.

B. Wall-hung counters.

1.02 RELATED REQUIREMENTS

A. Section 09 21 16 - Gypsum Board Assemblies: Support framing, grounds, and concealed blocking.

1.03 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design.

B. ANSI A208.2 - Medium Density Fiberboard (MDF) for Interior Applications.

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

D. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards.

E. CBC Ch. 11B - California Building Code-Chapter 11B.

F. ISFA 3-01 - Classification and Standards for Quartz Surfacing Material.

G. NEMA LD 3 - High-Pressure Decorative Laminates.

H. PS 1 - Structural Plywood.

I. WI (CCP) - Certified Compliance Program (CCP).

J. WI (MCP) - Monitored Compliance Program (MCP).

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Manufacturer's data sheets on each product to be used, including:

1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Specimen warranty.

C. Shop Drawings: Complete details of materials and installation.

1. Provide the information required by AWMAC/WI (NAAWS) Architectural Woodwork Standards.
2. Provide a Woodwork Institute Certified Compliance Label on the first page of the shop drawings.

D. Selection Samples: For each finish product specified, color chips representing manufacturer's full range of available colors and patterns.

E. Verification Samples: For each finish product specified, minimum size 6 inches square, representing actual product, color, and patterns.

F. Test Reports: Chemical resistance testing, showing compliance with specified requirements.

G. Certificate: Submit labels and certificates required by quality assurance and quality control programs.

H. Installer's qualification statement.

I. Installation Instructions: Manufacturer's installation instructions and recommendations.

J. Maintenance Data: Manufacturer's instructions and recommendations for maintenance and repair of countertop surfaces.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than three years of documented experience.

B. Quality Certification: Provide WI (MCP) inspection report and quality certification of completed work.

1. Comply with WI (CCP) woodwork association quality certification service/program in accordance with requirements for work specified in this section: www.woodworkinstitute.com/#sle.
2. Provide labels or certificates indicating that the installed work complies with AWMAC/WI (NAAWS) requirements for grade or grades specified.
3. Provide designated labels on shop drawings as required by certification program.
4. Provide designated labels on installed products as required by certification program.
    a. Before delivery to the jobsite the woodwork supplier shall provide a Woodwork Institute Certified Compliance Certificate indicating the millwork products being supplied and Certifying that these products fully meet the requirements of the Grade or Grades specified.
    b. Provide a Woodwork Institute Certified Compliance Label on each Plastic Laminate, Solid Surface, and Solid Phenolic Core countertop.
5. Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.
    a. At completion of installation the woodwork installer shall provide a Woodwork Institute Certified Compliance Certificate indicating the products installed, and Certifying that the installation of these products fully meets the requirements of the Grade or Grades specified.
6. All fees charged by the Woodwork Institute for their Certified Compliance program are the responsibility of the millwork manufacturer and/or installer and shall be included in the bid.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.07 FIELD CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.08 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within a one year period after Date of Substantial Completion.

C. Provide five year manufacturer warranty for material defects.

PART 2 PRODUCTS

2.01 COUNTERTOPS

A. Quality Standard: Premium Grade, in accordance with AWMAC/WI (NAAWS), unless noted otherwise.

B. Natural Quartz and Resin Composite Countertops: Sheet or slab of natural quartz and plastic resin over continuous substrate.

1. Flat Sheet Thickness: 3/4 inch, minimum.

2. Natural Quartz and Resin Composite Sheets, Slabs and Castings: Complying with ISFA 3-01 and NEMA LD 3; orthophthalic polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard stone fabrication tools; no surface coating; color and pattern consistent throughout thickness.

a. Manufacturers:

1) Basis of Design Product: Corian Quartz as manufactured by Dupont, or approved equal.

2) DuPont Corporation; Corian Quartz: www.surfaces.dupont.com; www.corianquartz.com.

3) LG Hausys; HI-MACS Quartz Surface: www.lghausys.com.

4) Seieffe Corporation; OKITE®: www.okite.us/#sle.

5) US Quartz Products Inc. (CaesarStone U.S.A., Inc.); Ceasarstone: www.caesarstoneus.com.

6) Wilsonart: www.wilsonart.com/#sle.

7) Or Equal Substitutions: See Section 01 60 00 - Product Requirements.

b. Factory fabricate components to the greatest extent practical in sizes and shapes indicated; comply with the MIA (DSDM).

c. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.

d. Finish on Exposed Surfaces: Polished.

e. Color and Pattern: As indicated on drawings.

3. Other Components Thickness: 3/4 inch, minimum.

4. Exposed Edge Treatment: Built up to minimum 1-1/4 inch thick; square edge.

5. Back and End Splashes: Same sheet material, square top; minimum 4 inches high.

6. Skirts: As indicated on drawings.

7. Fabricate in accordance with AWMAC/WI (NAAWS), Section 11 - Countertops, Premium Grade.

8. Fabricate in accordance with manufacturer's standard requirements.

2.02 MATERIALS

A. Plywood for Supporting Substrate: PS 1 Exterior Grade, A-C veneer grade, minimum 5-ply; minimum 3/4 inch thick; join lengths using metal splines.

B. Medium Density Fiberboard for Supporting Substrate: ANSI A208.2.

C. Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined.

D. Cleaning Agents: Non-abrasive, soft-scrub type kitchen cleansers.

E. Joint Sealant: Mildew-resistant silicone sealant, clear.

1. Provide anti-bacterial type in toilet rooms, food preparation areas, and healthcare areas.

2.03 FABRICATION

A. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.

1. Join lengths of tops using best method recommended by manufacturer.

2. Fabricate to overhang fronts and ends of cabinets 1 inch except where top butts against cabinet or wall.

3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.

B. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.

1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.

2. Height: 4 inches, unless otherwise indicated.

C. Wall-Mounted Counters: Provide brackets and braces as indicated on drawings.

1. Mounting: Inside wall to side of stud.

2. Finish: As selected from the manufacturer's standard range.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.
   1. Verify dimensions by field measurements prior to fabrication.
   2. Heights and clearances are to conform to ADA Standards and CBC Ch. 11B.
   3. Verify that substrates supporting quartz surfaces are plumb, level, and flat to within 1/8 inch in ten feet (3 mm in 3000 mm) and that necessary supports and blocking are in place.
   4. Base Cabinets: Cabinet units shall be securely fixed to adjoining units and structure.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

C. Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.

D. Inspect finished surfaces for damage. Do not install until damage materials have been repaired in an acceptable manner or replaced.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Protect finished surfaces against scratches. Apply masking where necessary. Guard against grit, dust, and other trades.

3.03 INSTALLATION

A. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.

B. Seal joint between back/end splashes and vertical surfaces.

3.04 TOLERANCES

A. Variation From Horizontal: 1/8 inch in 10 feet, maximum.

B. Offset From Wall, Countertops: 1/8 inch maximum; 1/16 inch minimum.

C. Field Joints: 1/8 inch wide, maximum.
   1. Joints between backsplashes and countertops: Seal joints with silicone sealant.
   2. Joints Between Adjacent Pieces of Quartz Surfacing:
      a. Form joints between components using manufacturer's standard joint adhesive.
         1) Reinforce as required
      b. Joints shall be flush, tight fitting, level, and neat.
      c. Clamp or brace quartz surfacing in position until adhesive sets.

3.05 CLEANING

A. Remove masking and excess adhesives and sealants. Clean exposed surfaces.

B. Clean countertops surfaces thoroughly.

3.06 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

END OF SECTION

SECTION 13 31 00
FABRIC STRUCTURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. System is Owner Furnished and Owner (Vendor) Installed. OFOI

B. Tensile membrane structures.

C. Tensile membranes.

D. Flexible structural elements.

E. Pre-engineered fabric shade structure.

1.02 SUMMARY

A. The District will contract with an independent vendor (Owner's Vendor) to install the fabric structure. This section is provided for reference purposes of the SIte Contractor.

B. It shall be the responsibility of the successful fabric structure contractor (Owner's Vendor) to provide all labor, materials, equipment and tools necessary for the complete installation of the equipment, as indicated on the plans and as specified herein. The installation of all materials shall be performed in strict accordance with the manufacturer's installation instructions and in accordance with all approved shop drawings.

C. (Owner's Vendor) to furnish all labor, materials, tools and equipment necessary to install equipment as indicated on the Drawings and as specified herein; including components and accessories required for a complete installation. including but not limited to:

1. Coordination with related trades to ensure a complete, integrated, and timely installation

D. Concrete footings required for the system shall be as detailed and recommended by the fabric structure manufacturer, and as approved by the District.

1.03 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete.

B. Section 31 63 29 - Drilled Concrete Piers and Shafts: Drilled footing requirements.

1.04 ABBREVIATIONS AND ACRONYMS

A. HDPE: High-density polyethylene.

1.05 DEFINITIONS

A. See ASCE 55 for definitions of terms used in this section.

1.06 REFERENCE STANDARDS

A. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures.

B. ASCE 55 - Tensile Membrane Structures.

C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.

D. ASTM A135/A135M - Standard Specification for Electric-Resistance-Welded Steel Pipe.

E. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

F. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.

G. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.

H. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.

I. ASTM A992/A992M - Standard Specification for Structural Steel Shapes.

J. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

K. ASTM E136 - Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750 Degrees C.

L. AWS D1.1/D1.1M - Structural Welding Code - Steel.

M. CBC - California Building Code.

N. CCR Title 19 - Fabric Enclosures - Division 1 State Fire Marshall, Chapter 2. Tents, Awnings and Other Fabric Enclosures.

O. CFC - California Fire Code.

P. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films.

1.07 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Conduct meeting two weeks prior to commencing work of this section.

1. Require attendance of parties directly affecting work of this section, including:
    a. Applicable subcontractors.
    b. Contractor.
    c. Membrane manufacturer field representative.
    d. Architect.
    e. Inspection and testing agency representative.
2. Review erection drawings, sequence, schedule, and procedures; tensile membrane handling, preparation, installation, and protection requirements, and coordination with related structural work.

1.08 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: For tensile membranes and flexible structural elements.

C. Shop Drawings:

1. Signed and sealed by Engineer of Record responsible for design of fabric structures.

2. Plans:
    a. Include column centers, elevations, and dimensions.
    b. Indicate membrane layouts, membrane seams, flexible structural elements, anchorages, and interfaces with nonflexible structural elements.
    c. Drawing Scale: 1/8 inch to 1 foot, minimum.
3. Details: Include connections, anchorages, and bearing supports.
    a. Drawing Scale: 1-1/2 inches to 1 foot, minimum.

D. Samples: For each membrane type, two samples, 12 inches by 12 inches in size, indicating specified color.

E. Test Reports: Indicate compliance with specified requirements for tensile membranes.

F. Certifications:
1. Provide copy of current fabric certification from California State Fire Marshall.
2. Provide a letter of authorization from fabric manufacture for use of fabric for the fabric specified in this section.

G. Executed warranty.

H. Specimen warranty.

I. Project Record Documents: Indicate actual locations of connectors and repairs.

1.09 QUALITY ASSURANCE

A. Designer Qualifications: Perform design under direct supervision of Professional Engineer experienced in design of this type of work and licensed in California; with at least three years of documented experience.

B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with at least three years of documented experience.

C. Fabricator Qualifications: Company specializing in fabricating products specified in this section, with at least three years of documented experience.

D. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of type specified in this section.
1. Special inspection requirements by a DSA approved independent inspection agency shall follow and meet the T & I list as approved by DSA. The shop fabrication shall include welding of all steel members and identification of steel and fabric material through mill certification or material testing. Uncertified steel shall be tested to the requirements of CBC.

E. All bidders to have a DSA pre-approved PC number for structural drawings for sizes referenced in this bid at the time of bid.

1.10 DELIVERY, STORAGE, AND HANDLING

A. See Section 01 74 19 - Construction Waste Management and Disposal for packaging waste requirements.

B. Deliver materials to project site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

C. Store products under cover, elevated above grade, and in dry, well-ventilated areas not exposed to heat or sunlight.

D. Handle fabric in accordance with manufacturer's instructions.

1. Use care in handling tensile membranes to avoid damage fabric and coating.
2. Do not damage, crush, or kink cables.

1.11 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Manufacturer Warranty: Provide 10-year manufacturer warranty for tensile membranes. Complete forms in District's name and register with manufacturer.

C. Provide twenty year manufacturer warranty for all upright posts, cables, and tensioning plates against failure due to rust-through corrosion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design Product: DSA Pre-Approved Shade Structures as manufactured by USA Shade & Fabric Structures, Inc, or approved equal.

1. Local representative: 50 Kalmus Drive, Costa Mesa CA 714.427.6981 office.

B. Pre-Engineered Shade Structures:

1. USA Shade & Fabric Structures, Inc: www.usashade.com.
2. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 TENSILE MEMBRANE STRUCTURES

A. Tensile membrane structures consisting of tensioned membranes stretched over flexible and nonflexible structural support elements.

1. Provide smooth uniform membrane surface with even-curved edges and interfaces; without wrinkles, cuts, abrasions, stains, marks, surface defects, or seaming aberrations.
2. Configuration as indicated on drawings.

2.03 STRUCTURAL DESIGN CRITERIA

A. Comply with requirements for contractor's design-related professional design services; see Section 01 40 00 - Quality Requirements.

B. As indicated on drawings.

C. Engineer structures to meet or exceed the requirements of the ASCE 7 and California Building Code (CBC), with the following criteria as indicated on PC Drawings:

Occupancy A-3

Exposure Level C

Design Loads Per ASCE 7.

D. Division of the State Architect Approved Bid Scope:

1. Building Codes: Proposed structure is approved as part of the overall A-Number for this project.
    a. Approved structure conatins proprietary information of the manufacturer. Selected sheets of Drawings have not been released for bid and will be made available to the successful bidders after Notice to Proceed.
    b. Alternate products are required to follow Design-Build Scope as noted below and substitutions procedure: See Section 01 60 00 - Product Requirements.

E. Design Build Scope:
1. Building Codes: Proposed structure shall be Division of the State Architect approved and conform to the CBC using a minimum wind load based on 90 mph, 3 second gusts, exposure C, and a seismic (earthquake) load as indicated on PC Drawings. All shade structures shall be engineered with a zero wind pass through on the fabric.
    a. Contractor is responsible for submittal through the Architect and approval by Division of the State Architect.
2. Foundation designs shall be based on CBC , table 1804.2, soil type 5 (1500 lbs/psf)
3. Concrete shall be tested per Section 01 45 33 - Code-Required Special Inspections and Procedures, CBC section 1903A and inspected per CBC section 1704A.4.

2.04 SYSTEM DESCRIPTION

A. A pre-engineered steel tubular framed fabric stucture in the size indicated on the Drawings.

B. Standard Footings:
1. Provide footings per stringent California building codes for the specific structure. Columns will be provided as standard direct embedment or optional pier mount (anchoring hardware supplied by General Contractor).

C. All tubing shall be pre-cut to appropriate lengths, and where applicable all outside surfaces shall be galvanized, with an interior corrosion-resistant zinc-rich coating.

D. Roofing:
1. Sails are designed by manufacturer for use with polyethylene shade fabric.
2. Fabric is attached to posts using the fastening systems below in conjunction with vinyl covered minimum ¼" diameter stainless steel cables.
3. Cable fasteners are zinc-plated copper.

E. Fastening System:
1. Deliver fabric complete with independent cables pre-inserted in fabric hems.
2. Each cable shall be looped and clamped at each end.
3. Fastening System to consist of a fastening device factory installed at each roof rafter corner.
    a. Concealed attachment hook and sleeve at each rafter corner to move along a track in the rafter.
    b. Cables are attached to hook which is welded to the moving sleeve, thereby distributing tension evenly over rafters and not directly onto the mechanism.

4. Seal rafters with no penetrations on the top side, thereby preventing water from entering.
5. Provide a moving sleeve with hook to allow the looped ends of each cable to slide over the hook when the sleeve is at its upper position.
    a. Then by turning the concealed fastener within the rafter, moves the sleeve with hook outward (toward end of the rafter), thereby tensioning the cables and securing the fabric at the proper tautness.
6. Secure a locking cap at the end of each rafter with a vandal-resistant bolt.
7. Continuous one-piece cables, cables which are not independent per side and pre-looped and clamped at the factory, and/or cables which must be tensioned with the use of turnbuckles or tools not provided by the manufacturer (other than a common deep socket) are not acceptable.
8. Structures which do not feature the Fastening System on each and every rafter, or fastening mechanisms which do not feature a sealed top rafter and moving outer sleeve such as the Turn-N-Slide, are not acceptable

2.05 FIRE-RESISTANCE CRITERIA

A. Combustibility Testing: Noncombustible when tested in accordance with ASTM E136.

B. Flame Propagation: Complying with NFPA 701, test method 1 or 2.

C. Surface Burning Characteristics: Flame spread index of 75 or less and smoke developed index of 450 or less; when tested in accordance with ASTM E84.

D. California State Fire Marshall Approved, (CFC) : Yes, per CCR Title 19 - Fabric Enclosures.

2.06 TENSILE MEMBRANES

A. High-Density Polyethylene (HDPE) Membranes.
    1. Weight: 10 oz/sq yd.
    2. Weave Style: Knitted.
    3. Color: As selected from manufacturer's standard selection.
    4. Products:
        a. Gale Pacific L; Commercial NinetyFive 340 FR: www.galecommercial.com
        b. Substitutions: See Section 01 60 00 - Product Requirements.

2.07 FLEXIBLE STRUCTURAL ELEMENTS

A. Cables, Fittings, and Anchorages:
    1. Structural Stainless Steel Cables: ASTM A666/A666M, Type 304 or Type 316.
    2. Cable Length Tolerance: As indicated on drawings.
    3. Swaged End Fittings, Pins, Nuts, and Washers: Stainless steel.
    4. Fasteners in Membrane Clamping Systems: Stainless steel.

B. Shackles, Rigging Screws, Clamps, and Tensioning Hardware:
    1. Stainless steel, ASTM A666/A666M, Type 304 or Type 316.

2.08 NONFLEXIBLE STRUCTURAL ELEMENTS

A. Concrete Foundations: See Section 03 30 00, and pre-engineered drawings.

B. Steel Sections: Steel plates, bars, angles, and channels; ASTM A36/A36M.

1. Galvanized Steel: Structural shapes, plates and bars: From fully killed or semi-killed steel, ASTM A992/A992M, except silicon content in the range 0 to 0.4 percent or 0.15 to 0.25 percent, as applicable, only.

C. Steel Tubing: ASTM A500/A500M Grade B cold-formed structural tubing and ASTM A135/A135M steel pipe.

1. Minimum yield strength: 40,000 psi with a minimum tensile strength of 45,000 psi on all posts.

2. Support Pipes, Where Required: Schedule 40 hot-dip galvanized or powder-coated black steel.

D. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

E. Finish: Powder Coated.

F. Color: As selected by Architect from the manucturer's standard range.

2.09 ACCESSORIES

A. Anchorage Devices: Provide anchorage devices and mechanical fasteners for securing tensile membranes and flexible structural elements to in-place construction as determined by the Structural Engineer of Record for design of tensile membrane structure.

B. Carbon Steel Fasteners: As recommended by the manufacturer.

1. Zinc Coating Finish: Galvanized by hot-dip process in compliance with ASTM A153/A153M.

C. Stainless Steel Fasteners: As recommended by the manufacturer

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine area to receive flexible structural elements and tensile membrane; notify Architect if area is not acceptable and do not begin installation until unacceptable conditions have been corrected.

B. Examine foundations and anchor bolts for location and elevation; notify Architect of inaccuracies, and do not begin installation until unacceptable conditions have been corrected.

3.02 PREPARATION

A. Prepare a clear, flat, smooth, and clean layout area on ground of sufficient size for assembly of tensile membrane panels; prepare area adjacent to location of structure installation.

B. Check contact surfaces to remove sharp objects, dirt, grease, oil, and other causes for rips, scratching, or other damage to tensile membrane panels during installation.

3.03 ERECTION

A. Comply with approved erection plan.

B. Do not undertake erection of tensile membranes during inclement weather conditions; installer has sole responsibility to determine when conditions are safe for erection.

C. Concrete Foundations:

1. See Section 03 30 00.

2. As indicated on drawings.

D. Support Steel:

1. As indicated on drawings.

E. Install tensile membranes and flexible structural elements in accordance with manufacturer's instructions.

1. Install to avoid damage to tensile membranes.

2. Ensure tensile membranes surfaces are smooth, uniform, and clean, with even-curved edges and interfaces, and with no cuts, scratches, abrasions, stains, marks, blemishes, or welding irregularities.

3.04 REPAIR

A. Inspect tensile membranes and flexible structural elements.

B. Repair or replace defective or damaged materials as directed by Architect.

3.05 ADJUSTING

A. Make final adjustments to tensile membranes and flexible structural elements as required for structural integrity, and in accordance with shapes and configuration indicated on drawings.

3.06 CLEANING

A. Clean and touchup flexible structural elements in accordance with manufacturer's field repair recommendations.

3.07 CLOSEOUT ACTIVITIES

A. See Section 01 78 00 - Closeout Submittals for additional submittals.

B. See Section 01 79 00 - Demonstration and Training for additional requirements.

END OF SECTION

SECTION 22 05 18
ESCUTCHEONS FOR PLUMBING PIPING

GENERAL

1.1 SUMMARY

A. Section Includes:

1. Escutcheons.
2. Floor plates.

1.2 WORK INCLUDED

A. Furnish all labor, materials, services, testing, transportation and equipment necessary for the completion of all plumbing work as indicated on drawings and specified herein. Work materials and equipment not indicated or specified which is necessary for the complete and proper operation of the work of this Section in accordance with the true intent and meaning of the contract documents shall be provided and incorporated at no additional cost to the Owner.

1.3 QUALITY ASSURANCE

A. Code Requirements: All work covered by this Section shall conform to the latest requirements of the following regulations:

1. C.C.R., Title 24, Part 5 (2025 CPC).
2. 2025 California Plumbing Code.
3. National Fire Protection Association.
4. California Division of the State Architect.
5. California State Division of Industrial Safety.
6. County Health Department.
7. Any other legally constituted body-having jurisdiction thereof.

B. Nothing in the specifications or drawings shall be construed to permit deviation from the requirements of governing codes unless approval for said deviation has been obtained from the legally constituted authorities having jurisdiction and from the Owner's representative.

1.4 DRAWINGS

A. Because of the small-scale drawings, it is not possible to indicate all offsets, fittings and accessories which may be required. The Contractor shall carefully investigate the conditions surrounding installation of his work, furnishing the necessary piping, fittings, valves, traps, and other devices which may be required to complete the installation.

B. The general arrangement indicated on the drawings shall be followed as closely as possible. Coordinate with the Architectural, Structural, Mechanical and Electrical Drawings and the work of other trades prior to installation of piping fixtures and equipment to verify adequate space

available for installation of the work shown. In the event a field condition arises which makes it impossible to install the work as indicated, submit, in writing, the proposed departures to the Architect for his approval. Only when Architect's approval is given, in writing, shall Contractor proceed with installation of the work.

C. Special Note: Should the Contractor make changes in the installation differing from what is indicated on the contract drawings and not necessitated due to field conditions as indicated hereinabove, the Contractor shall be required to re-install the work to comply with what has been indicated on the contract drawings. Should it be impossible to re-install the work and the installation is in accordance with all governing authorities, the architect may permit the installation to remain. However, all costs incurred to revise the contract drawings by the engineer for resubmittal to the building department indicating the as-installed condition shall become the responsibility of the Contractor.

D. In case of a difference in the specifications or between the specifications and the drawings, the Contractor shall figure the most expensive alternate and after award of contract, shall secure direction from the Architect.

1.5 PERMITS, INSPECTIONS AND LICENSES

A. All permits, inspections and licenses required by the legally constituted authorities for installation of the work according to the plans and specifications shall be obtained and paid as a part of the work of this section.

1.6 EXAMINATION OF PREMISES

A. Before bidding on this work, Contractors shall make a careful examination of the premises and shall thoroughly familiarize themselves with the requirements of the contract. By the act of submitting a proposal for the work included in this contract, the Contractor shall be deemed to have made such study and examination, and that he is familiar with and accepts all conditions of the site.

1.7 PROTECTION

A. All work, equipment and materials shall be protected at all times. Contractor shall make good all damage caused either directly or indirectly by his own workmen. Contractor shall also protect his own work from damage. He shall close all pipe openings with caps or plugs during installation. He shall protect all his equipment and materials against dirt, water, chemical and mechanical injury. Upon completion, all work shall be thoroughly cleaned and delivered in a new condition.

B. Contractor shall be held responsible for all damage to equipment and materials until he has received written notice from the Architect or Engineer that his work has been accepted.

1.8 LOCATIONS

A. The locations of apparatus, piping and equipment indicated on the drawings are approximate. Piping and equipment shall be installed in such a manner as to avoid all obstruction, preserve headroom, and keep openings and passages clear. The locations of and mounting heights of all fixtures shall be coordinated with the architectural plans and room elevations.

B. Clearances and Openings: Contractor shall cooperate and coordinate his work with all other trades to avoid conflict and permit for a neat and orderly appearance of the entire installation. The Contractor shall, in advance of the work, furnish instructions to the General Contractor as to his requirements for equipment and material installation of any kind, whether or not specifically mentioned on drawings or in the specifications, and shall include recesses, chases in walls, and all required openings in the structure. Should furnishing this information be neglected, delayed or incorrect and additional cuttings are found to be required, the cost of the same shall be charged to this Contractor.

C. Contractor shall verify and coordinate pipe routing with location of all electrical rooms, elevator equipment rooms, telecom/data rooms, and other rooms dedicated to the housing of switchgear, panels, or other electrical equipment. In no case shall piping be installed within or above the ceiling of such rooms.

1.9 SUBMITTAL DATA

A. Submittal Requirements:

1. Furnish, all at one time, prior to any installation, within the time noted below, six (6) copies of valid submittal data on all fixtures, material, equipment and devices. Each submitted item shall be indexed and referenced to these specifications and to identification numbers on fixtures and equipment schedules.
2. Manufacturers' submittal literature and shop drawings are required on all items to ensure the latest and most complete manufacturer's data is available for review. Requirements of the submittals and Engineer's submittal notes are a part of the work of this Division except that Engineer's notes may not be used as a means of increasing the scope of work of this Division.
3. Submittals will be checked for general conformance with the design concept of the project but the review does not guarantee quantities shown and does not supersede requirements of this Division to properly install work.
4. To be valid, all submittals must:
    a. Be delivered to the Architect's office within thirty-five (35) days of award of the contract. Contractor shall make time allowance for Engineer's review, return of comments, if any, and resubmittal if required. Corrections or changes in submittals returned as inadequate or incomplete shall be accomplished within this time limit.
    b. Clearly indicate and label as such any items proposed as substitution for that specified or shown on plans.
    c. Include all pertinent construction, installation, performance and technical data.
    d. Have all product data sheets clearly labeled to indicate the individual items being submitted. In addition, all required options and accessories shall be clearly marked.
        1) Product data sheets corresponding to items indicated on plans shall be clearly labeled with the corresponding fixture or equipment tag number.
        2) Product data sheets corresponding to items indicated in specifications shall be clearly labeled with the specification section, page and item numbers.

e. Include, for every item which differs in size, configuration, connections, service, accessibility or any other significant way, a drawing to the same (or larger) scale as to the pertinent portions of the contract drawings. In this drawing show a complete layout of the system except that which is identical to the contract drawings, unless the unchanged portions must be shown to indicate such things as clearances. This drawing, together with the contract design drawings must show the complete system as revised to accommodate the proposed alternate.

B. Substitution Requirements:

1. Any items included in submittals and proposed by the Contractor as substitution for that specified or shown on plans shall be submitted within thirty five (35) days of award of the contract. After such time, proposed substitutions shall not be accepted for review, and the Contractor shall submit all items as specified or shown on plans.

   a. For each item proposed as substitution for that specified or shown on plans, copies of product data sheets for the specified item shall be placed side by side with product data sheets for the proposed substitution item within the submittal.

      1) In addition to the Submittal Requirements for labeling listed above, product data sheets for the specified item shall be clearly labeled “SPECIFIED ITEM, NOT SUBMITTED”. Product data sheets for the corresponding proposed substitution item shall be clearly labeled “PROPOSED SUBSTITUTION”.

   b. Provide calculations and other detailed data justifying how any items proposed as substitution were selected for proposal. Data must be complete enough to permit detailed comparison of every significant characteristic for which the specified item was analyzed during design.

2. It shall be the Contractor’s responsibility to provide sufficient information to allow the Engineer to analyze any proposed alternate. If inadequate information is provided, the proposal will not be approved and resubmittal will not be allowed.

3. The Contractor shall provide or perform tests required by Engineer for purpose of judging acceptability of proposed substitutions.

4. The Contractor assumes full responsibility that alternate items and procedures will meet the job requirements and is responsible for cost of redesign and of modifications to this and other parts of work caused by alternate items furnished under work in this Section. In view of these responsibilities, it is the purpose of these specifications to establish procedures to ensure that the Contractor has considered all the ramifications of proposed alternates before submitting them for review. Submittals which do not comply with the requirements of these specifications or which indicate proposed alternates that were selected without proper regard to the requirements of the job will not be approved. No more than one proposed alternate will be considered for each item.

5. Alternate items installed without Engineer's approval will be replaced with specified items at Contractor's expense.

6. The Architect or his authorized representative shall be the sole judge as to the quality and suitability of proposed alternate equipment, fixtures or materials. Decisions of the Architect or that of his representative shall be final and conclusive.

1.10 UNINSPECTED WORK

A. The Contractor shall not allow or cause any of his work to be covered up or closed in until it has been inspected, tested, approved by all authorities have jurisdiction, and until Project Record drawings have been properly annotated.

B. Should any of his work be covered up or closed in before such inspection, he shall, at his own expense, uncover the work to the satisfaction of the inspection party. All related repair work cost shall be borne by the Contractor.

1.11 RECORD DRAWINGS

A. Contractor shall provide and keep up-to-date a complete "as-built" record set of blueline prints which shall show every change from the original drawings and the exact "as-built" locations and sizes of the work provided under this Section of the specifications. This set shall include locations, dimensions, depth of buried piping, cleanouts, shut-off valves, sewer invert locations, plugged wyes, tees, etc. On completion of the work, the Contractor shall incorporate all as-built information on a set of reproducible tracings provided by the Architect and this set of reproducibles shall be delivered to the Architect.

1.12 GUARANTEES

A. Contractor shall guarantee the entire plumbing and piping systems unconditionally for a period of one (1) year after final acceptance. If, during this period, any materials, equipment, or any part of the systems fail to function properly, the Contractor shall make good the defects promptly and without any expense to the Owner.

B. Contractor shall be responsible for all damage to any part of the premises caused by leaks in pipelines or equipment furnished and installed under this Section for a period of one (1) year after date of acceptance of his work.

C. All equipment and fixtures shall carry manufacturer's warranty against defective parts or poor workmanship for not less than one (1) year. See specific equipment specifications for extended warranty requirements.

PART 2 - PRODUCTS

2.1 ESCUTCHEONS

One-Piece, Cast-Brass Type: With polished, chrome-plated and rough-brass finish and setscrew fastener.

B. One-Piece, Deep-Pattern Type: Deep-drawn, box-shaped brass with chrome-plated finish and spring-clip fasteners.

FLOOR PLATES

A. One-Piece Floor Plates: Cast-iron flange with holes for fasteners.

B. Split-Casting Floor Plates: Cast brass with concealed hinge.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install escutcheons for piping penetrations of walls, ceilings, and finished floors.

B. Install escutcheons with ID to closely fit around pipe, tube, and insulation of insulated piping and with OD that completely covers opening.

1. Escutcheons for New Piping:

a. Piping with Fitting or Sleeve Protruding from Wall: One-piece, deep-pattern type.

b. Chrome-Plated Piping: One-piece, cast-brass type with polished, chrome-plated finish.

Bare Piping at Wall and Floor Penetrations in Finished Spaces: One-piece, cast-brass type with polished, chrome-plated finish.

Bare Piping at Ceiling Penetrations in Finished Spaces: One-piece, cast-brass type with polished, chrome-plated finish.

Bare Piping in Unfinished Service Spaces: One-piece, cast-brass type with polished, chrome-plated or rough-brass finish.

Bare Piping in Equipment Rooms: One-piece, cast-brass type with polished, chrome-plated or rough-brass finish.

C. Install floor plates for piping penetrations of equipment-room floors.

D. Install floor plates with ID to closely fit around pipe, tube, and insulation of piping and with OD that completely covers opening.

New Piping: One-piece, floor-plate type.

2. Existing Piping: Split-casting, floor-plate type.

3.2 FIELD QUALITY CONTROL

A. Replace broken and damaged escutcheons and floor plates using new materials.

END OF SECTION

SECTION 22 05 23

GENERAL-DUTY VALVES FOR PLUMBING PIPING

GENERAL

1.1 SUMMARY

A. Section Includes:

1. Bronze ball valves.
2. Ductile-iron, single-flange butterfly valves.
3. Bronze lift check valves.
4. Bronze swing check valves.
5. Bronze gate valves.
6. Iron gate valves
7. Manual circuit balancing valves.
8. Gas shut-off cocks.
9. LPG shut-off cocks.

B. Related Sections:

Division 2 water distribution piping Sections for general-duty and specialty valves for site construction piping.

2. Division 22 plumbing piping Sections for specialty valves applicable to those Sections only.
3. Division 22 Section "Identification for Plumbing Piping and Equipment" for valve tags and schedules.

1.2 DEFINITIONS

CWP: Cold working pressure.

B. EPDM: Ethylene propylene diene terpolymer rubber.

C. NBR: Acrylonitrile-butadiene, Buna-N, or nitrile rubber.

D. NRS: Nonrising stem.

E. OS&Y: Outside screw and yoke.

F. RS: Rising stem.

G. SWP: Steam working pressure.

1.3 WORK INCLUDED

A. Furnish all labor, materials, services, testing, transportation and equipment necessary for the completion of all plumbing work as indicated on drawings and specified herein. Work materials and equipment not indicated or specified which is necessary for the complete and proper

operation of the work of this Section in accordance with the true intent and meaning of the contract documents shall be provided and incorporated at no additional cost to the Owner.

1.4 QUALITY ASSURANCE

A. Code Requirements: All work covered by this Section shall conform to the latest requirements of the following regulations:

1. C.C.R., Title 24, Part 5 (2025 CPC).
2. 2025 California Plumbing Code.
3. National Fire Protection Association.
4. California Division of the State Architect.
5. California State Division of Industrial Safety.
6. County Health Department.
7. Any other legally constituted body-having jurisdiction thereof.

B. Nothing in the specifications or drawings shall be construed to permit deviation from the requirements of governing codes unless approval for said deviation has been obtained from the legally constituted authorities having jurisdiction and from the Owner's representative.

1.5 DRAWINGS

A. Because of the small-scale drawings, it is not possible to indicate all offsets, fittings and accessories which may be required. The Contractor shall carefully investigate the conditions surrounding installation of his work, furnishing the necessary piping, fittings, valves, traps, and other devices which may be required to complete the installation.

B. The general arrangement indicated on the drawings shall be followed as closely as possible. Coordinate with the Architectural, Structural, Mechanical and Electrical Drawings and the work of other trades prior to installation of piping fixtures and equipment to verify adequate space available for installation of the work shown. In the event a field condition arises which makes it impossible to install the work as indicated, submit, in writing, the proposed departures to the Architect for his approval. Only when Architect's approval is given, in writing, shall Contractor proceed with installation of the work.

C. Special Note: Should the Contractor make changes in the installation differing from what is indicated on the contract drawings and not necessitated due to field conditions as indicated hereinabove, the Contractor shall be required to re-install the work to comply with what has been indicated on the contract drawings. Should it be impossible to re-install the work and the installation is in accordance with all governing authorities, the architect may permit the installation to remain. However, all costs incurred to revise the contract drawings by the engineer for resubmittal to the building department indicating the as-installed condition shall become the responsibility of the Contractor.

D. In case of a difference in the specifications or between the specifications and the drawings, the Contractor shall figure the most expensive alternate and after award of contract, shall secure direction from the Architect.

1.6 PERMITS, INSPECTIONS AND LICENSES

A. All permits, inspections and licenses required by the legally constituted authorities for installation of the work according to the plans and specifications shall be obtained and paid as a part of the work of this section.

1.7 EXAMINATION OF PREMISES

A. Before bidding on this work, Contractors shall make a careful examination of the premises and shall thoroughly familiarize themselves with the requirements of the contract. By the act of submitting a proposal for the work included in this contract, the Contractor shall be deemed to have made such study and examination, and that he is familiar with and accepts all conditions of the site.

1.8 PROTECTION

A. All work, equipment and materials shall be protected at all times. Contractor shall make good all damage caused either directly or indirectly by his own workmen. Contractor shall also protect his own work from damage. He shall close all pipe openings with caps or plugs during installation. He shall protect all his equipment and materials against dirt, water, chemical and mechanical injury. Upon completion, all work shall be thoroughly cleaned and delivered in a new condition.

B. Contractor shall be held responsible for all damage to equipment and materials until he has received written notice from the Architect or Engineer that his work has been accepted.

1.9 LOCATIONS

A. The locations of apparatus, piping and equipment indicated on the drawings are approximate. Piping and equipment shall be installed in such a manner as to avoid all obstruction, preserve headroom, and keep openings and passages clear. The locations of and mounting heights of all fixtures shall be coordinated with the architectural plans and room elevations.

B. Clearances and Openings: Contractor shall cooperate and coordinate his work with all other trades to avoid conflict and permit for a neat and orderly appearance of the entire installation. The Contractor shall, in advance of the work, furnish instructions to the General Contractor as to his requirements for equipment and material installation of any kind, whether or not specifically mentioned on drawings or in the specifications, and shall include recesses, chases in walls, and all required openings in the structure. Should furnishing this information be neglected, delayed or incorrect and additional cuttings are found to be required, the cost of the same shall be charged to this Contractor.

C. Contractor shall verify and coordinate pipe routing with location of all electrical rooms, elevator equipment rooms, telecom/data rooms, and other rooms dedicated to the housing of switchgear, panels, or other electrical equipment. In no case shall piping be installed within or above the ceiling of such rooms.

1.10 SUBMITTAL DATA

A. Submittal Requirements:

1. Furnish, all at one time, prior to any installation, within the time noted below, six (6) copies of valid submittal data on all fixtures, material, equipment and devices. Each submitted item shall be indexed and referenced to these specifications and to identification numbers on fixtures and equipment schedules.
2. Manufacturers' submittal literature and shop drawings are required on all items to ensure the latest and most complete manufacturer's data is available for review. Requirements of the submittals and Engineer's submittal notes are a part of the work of this Division except that Engineer's notes may not be used as a means of increasing the scope of work of this Division.
3. Submittals will be checked for general conformance with the design concept of the project but the review does not guarantee quantities shown and does not supersede requirements of this Division to properly install work.
4. To be valid, all submittals must:
    a. Be delivered to the Architect's office within thirty-five (35) days of award of the contract. Contractor shall make time allowance for Engineer's review, return of comments, if any, and resubmittal if required. Corrections or changes in submittals returned as inadequate or incomplete shall be accomplished within this time limit.
    b. Clearly indicate and label as such any items proposed as substitution for that specified or shown on plans.
    c. Include all pertinent construction, installation, performance and technical data.
    d. Have all product data sheets clearly labeled to indicate the individual items being submitted. In addition, all required options and accessories shall be clearly marked.
        1) Product data sheets corresponding to items indicated on plans shall be clearly labeled with the corresponding fixture or equipment tag number.
        2) Product data sheets corresponding to items indicated in specifications shall be clearly labeled with the specification section, page and item numbers.
    e. Include, for every item which differs in size, configuration, connections, service, accessibility or any other significant way, a drawing to the same (or larger) scale as to the pertinent portions of the contract drawings. In this drawing show a complete layout of the system except that which is identical to the contract drawings, unless the unchanged portions must be shown to indicate such things as clearances. This drawing, together with the contract design drawings must show the complete system as revised to accommodate the proposed alternate.

B. Substitution Requirements:
1. Any items included in submittals and proposed by the Contractor as substitution for that specified or shown on plans shall be submitted within thirty five (35) days of award of the contract. After such time, proposed substitutions shall not be accepted for review, and the Contractor shall submit all items as specified or shown on plans.

a. For each item proposed as substitution for that specified or shown on plans, copies of product data sheets for the specified item shall be placed side by side with product data sheets for the proposed substitution item within the submittal.

1) In addition to the Submittal Requirements for labeling listed above, product data sheets for the specified item shall be clearly labeled “SPECIFIED ITEM, NOT SUBMITTED”. Product data sheets for the corresponding proposed substitution item shall be clearly labeled “PROPOSED SUBSTITUTION”.

b. Provide calculations and other detailed data justifying how any items proposed as substitution were selected for proposal. Data must be complete enough to permit detailed comparison of every significant characteristic for which the specified item was analyzed during design.

2. It shall be the Contractor’s responsibility to provide sufficient information to allow the Engineer to analyze any proposed alternate. If inadequate information is provided, the proposal will not be approved and resubmittal will not be allowed.

3. The Contractor shall provide or perform tests required by Engineer for purpose of judging acceptability of proposed substitutions.

4. The Contractor assumes full responsibility that alternate items and procedures will meet the job requirements and is responsible for cost of redesign and of modifications to this and other parts of work caused by alternate items furnished under work in this Section. In view of these responsibilities, it is the purpose of these specifications to establish procedures to ensure that the Contractor has considered all the ramifications of proposed alternates before submitting them for review. Submittals which do not comply with the requirements of these specifications or which indicate proposed alternates that were selected without proper regard to the requirements of the job will not be approved. No more than one proposed alternate will be considered for each item.

5. Alternate items installed without Engineer's approval will be replaced with specified items at Contractor's expense.

6. The Architect or his authorized representative shall be the sole judge as to the quality and suitability of proposed alternate equipment, fixtures or materials. Decisions of the Architect or that of his representative shall be final and conclusive.

1.11 QUALITY ASSURANCE

A. Source Limitations for Valves: Obtain each type of valve from single source from single manufacturer.

B. ASME Compliance:

1. ASME B16.10 and ASME B16.34 for ferrous valve dimensions and design criteria.

2. ASME B31.1 for power piping valves.

3. ASME B31.9 for building services piping valves.

C. NSF Compliance: NSF 61-G and NSF-372 for valve materials for potable-water service.

1. Valves for domestic water must comply with the Federal Reduction of Lead in Drinking Water Act.
    a. "Lead Free" refers to the wetted surface of pipe, fittings and fixtures in potable water systems that have a weighted average lead content ≤ 0.25%.
    b. All valves must be 3rd party certified.
    c. Bronze valves shall be made of dezincification-resistant material.

1.12 DELIVERY, STORAGE, AND HANDLING

Prepare valves for shipping as follows:

1. Protect internal parts against rust and corrosion.
2. Protect threads, flange faces, grooves, and weld ends.
3. Set angle, gate, and globe valves closed to prevent rattling.
4. Set ball and plug valves open to minimize exposure of functional surfaces.
5. Set butterfly valves closed or slightly open.
6. Block check valves in either closed or open position.

B. Use the following precautions during storage:
    1. Maintain valve end protection.
    2. Store valves indoors and maintain at higher than ambient dew point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.

C. Use sling to handle large valves; rig sling to avoid damage to exposed parts. Do not use handwheels or stems as lifting or rigging points.

1.13 UNINSPECTED WORK

A. The Contractor shall not allow or cause any of his work to be covered up or closed in until it has been inspected, tested, approved by all authorities have jurisdiction, and until Project Record drawings have been properly annotated.

B. Should any of his work be covered up or closed in before such inspection, he shall, at his own expense, uncover the work to the satisfaction of the inspection party. All related repair work cost shall be borne by the Contractor.

1.14 RECORD DRAWINGS

A. Contractor shall provide and keep up-to-date a complete "as-built" record set of blueline prints which shall show every change from the original drawings and the exact "as-built" locations and sizes of the work provided under this Section of the specifications. This set shall include locations, dimensions, depth of buried piping, cleanouts, shut-off valves, sewer invert locations, plugged wyes, tees, etc. On completion of the work, the Contractor shall incorporate all as-built information on a set of reproducible tracings provided by the Architect and this set of reproducibles shall be delivered to the Architect.

1.15 GUARANTEES

A. Contractor shall guarantee the entire plumbing and piping systems unconditionally for a period of one (1) year after final acceptance. If, during this period, any materials, equipment, or any part of the systems fail to function properly, the Contractor shall make good the defects promptly and without any expense to the Owner.

B. Contractor shall be responsible for all damage to any part of the premises caused by leaks in pipelines or equipment furnished and installed under this Section for a period of one (1) year after date of acceptance of his work.

C. All equipment and fixtures shall carry manufacturer's warranty against defective parts or poor workmanship for not less than one (1) year. See specific equipment specifications for extended warranty requirements.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR VALVES

Refer to valve schedule articles for applications of valves.

B. Piping systems shall be supplied with valves arranged so as to give complete and regulating control of each building and piping systems throughout the building, and located so all parts are easily accessible and maintained.

1. Valve Design: Rising stem or outside screw and yoke stems. Non-rising stem valves may be used where space conditions prevent full extension of rising stems.
2. Sizes: Same size as upstream pipe, unless otherwise indicated.
3. Extended stems: Where piping insulation is indicated or specified, valves shall be equipped with 2” extended handles of non-thermal conductive material. Also provide a protective sleeve that allows operation of the valve without breaking the vapor seal or disturbing the insulation. Supply with memory stops, which are fully adjustable after insulation is applied.
4. End Connection: 2 inch and under shall be threaded, 2-1/2 inches and larger shall be flanged or full lug style.

C. Valves for Potable Water must comply with California Lead Free Law, effective January 1, 2010.

1. “Lead Free” refers to the wetted surface of pipe, fittings and fixtures in potable water systems that have a weighted average lead content ≤ 0.25%. Source: California Health & Safety Code (116875).
2. All valves must be 3rd party certified.
3. Bronze valves shall be made with dezincification-resistant material.

D. Where possible, valves of one manufacturer shall be used.

E. Provide Class 150 valves meeting the valve specifications where Class 125 valves are specified but are not available.

F. Bronze valves shall be made with dezincification-resistant materials, (Bronze ASTM B62, B61, or B584 Alloy C87850). This includes body, ball, stem and / or trim.

G. Bronze Valves: NPS 2 and smaller with threaded ends, unless otherwise indicated.

H. Ferrous Valves: NPS 2-1/2 and larger with flanged ends, unless otherwise indicated.

Valve Pressure and Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.

J. Valve Sizes: Same as upstream piping unless otherwise indicated.

K. Valve Actuator Types:

1. Hand-wheel: For valves other than quarter-turn types.
2. Hand-lever: For quarter-turn valves NPS 6 and smaller.

L. Valves in Insulated Piping: With 2-inch stem extensions and the following features:

1. Ball Valves: With extended operating handle of non-thermal-conductive material, and protective sleeve that allows operation of valve without breaking the vapor seal or disturbing insulation and memory stops that are fully adjustable after insulation is applied.
   a. Basis-of-Design Product: Subject to compliance with requirements, provide NIBCO Nib-seal handle extension or comparable product by one of the following:
   b. General valves:
      1) NIBCO
      2) Hammond
      3) Milwaukee
   c. Below grade domestic water shut-off valves (gate valves) 2” and larger:
      1) NIBCO.
      2) Clow.
      3) Mueller.
   d. Butterfly Valves:
      1) NIBCO.
      2) Demco.
      3) Dezuric.
   e. Plug Valves:
      1) Hammond.
      2) Milwaukee.
   f. Check valves, lift type:

1) Hammond.
2) Milwaukee.

g. Below grade backwater valve isolation valves:
1) NIBCO.
2) Clow.
3) Mueller.

2. Butterfly Valves: With extended neck.

M. Valve-End Connections:

1. Flanged: With flanges according to ASME B16.1 for iron valves, ASME B16.5 for steel valves.

2. Grooved: With grooves according to AWWA C606.

Solder Joint: With sockets according to ASME B16.18.

4. Threaded: With threads according to ASME B1.20.1.

N. Valve Bypass and Drain Connections: MSS SP-45.

2.2 BRONZE BALL VALVES

A. Three-Piece, Full-Port, Bronze Ball Valves with Stainless-Steel Trim & Nib-Seal Handle:

Basis-of-Design Product: Subject to compliance with requirements, provide NIBCO Model S-595-Y-66-LF or T-595-Y-66-LF or a comparable product by one of the following,

a. Milwaukee Valve Company.
b. Apollo.

2. Description:

c. Standard: MSS SP-110, NSF 61-G.
d. CWP Rating: 600 psig.
e. Body Design: Three piece with threaded body packnut design (no threaded stem designs allowed) with adjustable stem packing.
f. Body Material: Bronze ASTM B 584 Alloy C87850 or C87600.
g. Ends: Threaded or Solder.
h. Seats: PTFE or TFE.
i. Stem: 316 Stainless steel.
j. Ball: 316 Stainless steel, vented.
k. Port: Full.

Two-Piece, Full-Port, Bronze Ball Valves with Stainless-Steel Trim & Nib-Seal Handle:

Basis-of-Design Product: Subject to compliance with requirements, provide NIBCO Model S-585-66-LF or T-585-66-LF or a comparable product by one of the following:

a. Conbraco Industries, Inc.; Apollo Div.

b. Milwaukee Valve Company.

2. Description:

a. Standard: MSS SP-110, NSF 61-G.

b. CWP Rating: 600 psig.

c. Body Design: Two piece with threaded body packnut design (no threaded stem designs allowed) with adjustable stem packing.

d. Body Material: Bronze ASTM B 584 Alloy C87600.

e. Ends: Threaded or Solder.

f. Seats: PTFE or TFE.

g. Stem: 316 Stainless steel.

h. Ball: 316 Stainless steel, vented.

i. Port: Full.

C. 200 CWP, Sizes 2-1/2" – 24", Ductile Iron, Single-Flange Butterfly Valves with EPDM Seat and Aluminum-Bronze Disc:

Basis-of-Design Product: Subject to compliance with requirements, provide NIBCO Model LD-2000-3/5, or a comparable product by one of the following:

a. Cooper Cameron Corp.; Cooper Cameron Valves Div.

b. Tyco International, Ltd.; Tyco Valves & Controls

2. Description:

a. Standard: MSS SP-67, Type I, IAPMO.

b. NPS 24 (DN 300) and Smaller CWP Rating: 200 psig (1380 kPa).

c. Body Design: Full Lug type; Bubble tight shutoff, suitable for bidirectional dead-end service at rated pressure without use of downstream flange.

d. Body Material: ASTM A 536, ductile iron.

e. Seat: EPDM.

f. Stem: One- or two-piece stainless steel.

g. Disc: Aluminum bronze

D. Retain one or more of six paragraphs in this article if iron, single-flange butterfly valves are required. MSS SP-67 covers iron, single-flange butterfly valves NPS 1-1/2 to NPS 72.

2.3 BRONZE LIFT CHECK VALVES

Class 125, Lift Check Valves with Nonmetallic TFE Disc:

Basis-of-Design Product: Subject to compliance with requirements, provide NIBCO Model S-480-Y-LF or T-480-Y-LF or a comparable product by one of the following:

a. Hammond.

b. Milwaukee.

2. Description:

a. Standard: MSS SP-80, Type 2, NSF 61-G.

b. CWP Rating: 200 psig.

c. Body Design: Vertical flow.

d. Body Material: ASTM B 584 Alloy C87850, lead free bronze.

e. Ends: Threaded or Solder.

f. Disc: PTFE, or TFE.

2.4 BRONZE SWING CHECK VALVES

Class 125, Bronze Swing Check Valves with Nonmetallic TFE Disc:

Basis-of-Design Product: Subject to compliance with requirements, provide NIBCO Model S-413-Y-LF or T-413-Y-LF or a comparable product by one of the following:

a. Crane Co.; Crane Valve Group; Crane Valves.

b. Powell Valves.

2. Description:

a. Standard: MSS SP-80, Type 4, NSF 61-G.

b. CWP Rating: 200 psig.

c. Body Design: Y-pattern Horizontal flow.

d. Body Material: ASTM B 584 Alloy C87850, lead free bronze.

e. Ends: Threaded or Solder.

f. Disc: PTFE or TFE.

2.5 BRONZE GATE VALVES

NRS Bronze Gate Valves:

Basis-of-Design Product: Subject to compliance with requirements, provide NIBCO Model S-113-LF or T-113-LF or a comparable product by one of the following:

a. Crane Co.; Crane Valve Group; Crane Valves.

b. Powell Valves.

2. Description:

a. Standard: MSS SP-139, Type 2, NSF 61-G.

b. CWP Rating: 200 psig.

c. Body Material: ASTM B 584, dezincification-resistant bronze with integral seat and threaded bonnet.

d. Ends: Threaded or Solder.

e. Stem: Lead free Silicon Bronze.

f. Disc: Solid wedge; lead free bronze.

g. Packing: Asbestos free.

h. Handwheel: Malleable iron.

B. RS Bronze Gate Valves:

1. Basis-of-Design Product: Subject to compliance with requirements, provide NIBCO Model S-111-LF or T-111-LF or a comparable product by one of the following:

a. Crane Co.; Crane Valve Group; Crane Valves.

b. Powell Valves

2. Description:

a. Standard: MSS SP-80, Type 2, NSF 61-G.

b. CWP Rating: 200 psig.

c. Body Material: ASTM B584 C87850 dezincification resistant bronze with integral seat and threaded bonnet.

d. Ends: Threaded or Solder.

e. Stem: Lead free silicon bronze.

f. Disc: Solid wedge, lead free bronze.

g. Packing: Asbestos free.

h. Handwhell: Malleable iron.

2.6 IRON GATE VALVES

Class 125, Ductile-Iron Resilient Wedge Gate Valves:

Basis-of-Design Product: Subject to compliance with requirements, provide NIBCO Model F-619-RWS (NRS) or F-607-RWS (OS&Y) or a comparable product by one of the following:

a. Clow

b. Mueller

2. Description:
    a. Standard: AWWA C-509 and C-515,
    b. CWP Rating: 300 psig.
    c. Body Material: ASTM A-536 ductile iron, fusion-bonded epoxy coating inside and out.
    d. Ends: Flanged.
    e. Trim: stainless steel.
    f. Disc: Rubber encapsulated ductile iron wedge.
    g. Packing and Gasket: Asbestos free.

2.7 MANUAL CIRCUIT BALANCING VALVES

A. Bronze, Fixed Orifice, Balancing Valves (2" and smaller):

1. Basis-of-Design Product: Subject to compliance with requirements, provide NIBCO Model T/S-1810-LF or a comparable product by one of the following:

    a. Or approved equal

2. Description:

    a. CWP Rating: 300 psig
    b. Maximum Operating Temperature: 260°F.
    c. Body Material: Bronze or dezincification-resistant brass, lead free, Y-pattern globe type with fixed orifice (venture) for precise regulation and control. NO QUARTER TURN VALVES WILL BE ACCEPTED.
    d. Plug: Bronze or dezincification-resistant brass with EPDM O-Rings.
    e. Seat: Bronze or dezincification-resistant brass.
    f. Ends: Threaded or Solder.
    g. Pressure Gage Connections: Shall have two metering test ports with internal check and protective caps for use with portable differential pressure metering stations.
    h. Handle Style: Calibrated hand wheel equipped with visual position readout and hidden memory stops for repeatable regulation and control.

B. Cast-Iron or Steel, Calibrated-Orifice, Balancing Valves (2-1/2" and larger):

1. Basis-of-Design Product: Subject to compliance with requirements, provide NIBCO Model F/G 737A or a comparable product by one of the following:

a. Tour & Andersson

2. Description:

a. CWP Rating: 240 psig
b. Maximum Operating Temperature: 250°F.
c. Body Material: Cast-iron or steel body, globe pattern with calibrated orifice. NO BUTTERFLY VALVES.
d. Stem Seals: EPDM O-Rings
e. Disc: EPDM coated cast-iron disc.
f. Seat: Bronze or dezincification brass.
g. Ends: Flanged or grooved.
h. Pressure Gage Connection: Integral seals for portable differential pressure meter.
i. Handle Style: Calibrated hand wheel equipped with visual position readout and concealed memory stops for repeatable regulation and control.

2.8 GAS SHUT-OFF COCKS:

A. Gas Shut-Off Cocks, Above Grade (4" and smaller):

1. Basis-of-Design Product: Subject to compliance with requirements, provide NIBCO Model T-FP-600-A or a comparable product by one of the following:

a. Or approved equal.

2. Description:

a. Standard: MSS SP-110
b. CWP Rating: 600 psig.
c. SWP Rating: 150 psig.
d. Gas Rating: CSA certified and UL/FM listed.
e. Body Design: Two piece with threaded body pack nut design (no threaded stem designs al-lowed) with adjustable stem packing.
f. Body Material: Dezincification-resistant brass.
g. Seats: PTFE
h. Ball: Chrome-plated brass

i. Ends: Threaded

j. Port: Full

B. Gas Shut-Off Cocks, Below Grade:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Nordstom "Poly-Gas" or comparable product by one of the following:

a. Or approved equal.

2. Description:

a. Standards: ASTM D-2513 and ANSI B16.40

b. Valve boxes: cast iron tops marked "GAS", high-impact heavy-duty ABS valve can as manufactured by C.O. Test Services-VALVCO, Inc. or equal.

2.9 LPG SHUT-OFF COCKS:

A. LPG Shut-Off Cocks, Above Grade (3" and smaller):

1. Basis-of-Design Product: Subject to compliance with requirements, provide NIBCO Model T-585-70-UL (1/2" – 1") and T-580-70-UL (1-1/4" – 3") or a comparable product by one of the following:

a. Or approved equal.

2. Description:

a. Standard: MSS SP-110, CSA certified and UL/FM listed.

b. CWP Rating: 600 psig.

c. SWP Rating: 150 psig.

d. Gas Rating: 250 psi non-shock LP gas per UL842.

e. Body Design: Two piece with threaded body pack nut design (no threaded stem designs al-lowed) with adjustable stem packing.

f. Body Material: Dezincification-resistant brass.

g. Seats: PTFE

h. Ball: Chrome-plated brass

i. Ends: Threaded

j. Port: Full port (1/2" – 1"), conventional port (1-1/4" – 3")

B. LPG Shut-Off Cocks, Below Grade:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Nordstom "Poly-Gas" or comparable product by one of the following:

a. Or approved equal.

2. Description:

a. Standards: ASTM D-2513 and ANSI B16.40

b. Valve boxes: cast iron tops marked "GAS", high-impact heavy-duty ABS valve can as manufactured by C.O. Test Services-VALVCO, Inc. or equal.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.

B. Operate valves in positions from fully open to fully closed. Examine guides and seats made accessible by such operations.

C. Examine threads on valve and mating pipe for form and cleanliness.

D. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Verify that gasket is of proper size, that its material composition is suitable for service, and that it is free from defects and damage.

E. Do not attempt to repair defective valves; replace with new valves.

3.2 VALVE INSTALLATION

A. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.

B. Locate valves for easy access and provide separate support where necessary.

C. Install valves in horizontal piping with stem at or above center of pipe.

D. Install valves in position to allow full stem movement.

E. Install check valves for proper direction of flow and as follows:

Swing Check Valves: In horizontal position with hinge pin level.

2. Check Valves: In horizontal or vertical position, between flanges.

3. Lift Check Valves: With stem upright and plumb.

3.3 ADJUSTING

A. Adjust or replace valve packing after piping systems have been tested and put into service but before final adjusting and balancing. Replace valves if persistent leaking occurs.

3.4 GENERAL REQUIREMENTS FOR VALVE APPLICATIONS

If valve applications are not indicated, use the following:

1. Shutoff Service: Ball, butterfly valves.
2. Butterfly Valve Dead-End Service: Single-flange (lug) type.
3. Throttling Service: Ball or Butterfly valves.

B. If valves with specified SWP classes or CWP ratings are not available, the same types of valves with higher SWP classes or CWP ratings may be substituted.

C. Select valves, except wafer types, with the following end connections:

1. For Copper Tubing, NPS 2 and Smaller: Threaded ends.
2. For Copper Tubing, NPS 2-1/2 to NPS 4: Flanged ends.
3. For Steel Piping, NPS 2 and Smaller: Threaded ends.
4. For Steel Piping, NPS 2-1/2 to NPS 4: Flanged ends.

3.5 DOMESTIC, HOT- AND COLD-WATER VALVE SCHEDULE

A. Pipe NPS 2 and Smaller:

Bronze Valves: Threaded ends.

Ball Valves: Two piece, full port, bronze with stainless-steel trim.

3. Bronze Lift Check Valves: Class 125, nonmetallic TFE disc.
4. Bronze Swing Check Valves: Class 150, nonmetallic TFE disc.
5. Bronze Gate Valves: Class 150, RS.

B. Pipe NPS 2-1/2 and Larger:

Ductile-Iron, Single-Flange Butterfly Valves: 200 CWP, EPDM seat, aluminum-bronze disc.

END OF SECTION

SECTION 22 05 29

HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Metal pipe hangers and supports.
2. Trapeze pipe hangers.
3. Thermal-hanger shield inserts.
4. Fastener systems.

1.2 DEFINITIONS

A. MSS: Manufacturers Standardization Society of The Valve and Fittings Industry Inc.

1.3 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design trapeze pipe hangers and equipment supports, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

B. Structural Performance: Hangers and supports for plumbing piping and equipment shall withstand the effects of gravity loads and stresses within limits and under conditions indicated according to ASCE/SEI 7.

1. Design supports for multiple pipes, including pipe stands, capable of supporting combined weight of supported systems, system contents, and test water.
2. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
3. Design seismic-restraint hangers and supports for piping and equipment and obtain approval from authorities having jurisdiction.

1.4 WORK INCLUDED

A. Furnish all labor, materials, services, testing, transportation and equipment necessary for the completion of all plumbing work as indicated on drawings and specified herein. Work materials and equipment not indicated or specified which is necessary for the complete and proper operation of the work of this Section in accordance with the true intent and meaning of the contract documents shall be provided and incorporated at no additional cost to the Owner.

1.5 QUALITY ASSURANCE

A. Code Requirements: All work covered by this Section shall conform to the latest requirements of the following regulations:

1. C.C.R., Title 24, Part 5 (2025 CPC).
2. 2025 California Plumbing Code.
3. National Fire Protection Association.
4. California Division of the State Architect.
5. California State Division of Industrial Safety.
6. County Health Department.
7. Any other legally constituted body-having jurisdiction thereof.

B. Nothing in the specifications or drawings shall be construed to permit deviation from the requirements of governing codes unless approval for said deviation has been obtained from the legally constituted authorities having jurisdiction and from the Owner's representative.

1.6 DRAWINGS

A. Because of the small-scale drawings, it is not possible to indicate all offsets, fittings and accessories which may be required. The Contractor shall carefully investigate the conditions surrounding installation of his work, furnishing the necessary piping, fittings, valves, traps, and other devices which may be required to complete the installation.

B. The general arrangement indicated on the drawings shall be followed as closely as possible. Coordinate with the Architectural, Structural, Mechanical and Electrical Drawings and the work of other trades prior to installation of piping fixtures and equipment to verify adequate space available for installation of the work shown. In the event a field condition arises which makes it impossible to install the work as indicated, submit, in writing, the proposed departures to the Architect for his approval. Only when Architect's approval is given, in writing, shall Contractor proceed with installation of the work.

C. Special Note: Should the Contractor make changes in the installation differing from what is indicated on the contract drawings and not necessitated due to field conditions as indicated hereinabove, the Contractor shall be required to re-install the work to comply with what has been indicated on the contract drawings. Should it be impossible to re-install the work and the installation is in accordance with all governing authorities, the architect may permit the installation to remain. However, all costs incurred to revise the contract drawings by the engineer for resubmittal to the building department indicating the as-installed condition shall become the responsibility of the Contractor.

D. In case of a difference in the specifications or between the specifications and the drawings, the Contractor shall figure the most expensive alternate and after award of contract, shall secure direction from the Architect.

1.7 PERMITS, INSPECTIONS AND LICENSES

A. All permits, inspections and licenses required by the legally constituted authorities for installation of the work according to the plans and specifications shall be obtained and paid as a part of the work of this section.

1.8 EXAMINATION OF PREMISES

A. Before bidding on this work, Contractors shall make a careful examination of the premises and shall thoroughly familiarize themselves with the requirements of the contract. By the act of submitting a proposal for the work included in this contract, the Contractor shall be deemed to have made such study and examination, and that he is familiar with and accepts all conditions of the site.

1.9 PROTECTION

A. All work, equipment and materials shall be protected at all times. Contractor shall make good all damage caused either directly or indirectly by his own workmen. Contractor shall also protect his own work from damage. He shall close all pipe openings with caps or plugs during installation. He shall protect all his equipment and materials against dirt, water, chemical and mechanical injury. Upon completion, all work shall be thoroughly cleaned and delivered in a new condition.

B. Contractor shall be held responsible for all damage to equipment and materials until he has received written notice from the Architect or Engineer that his work has been accepted.

1.10 LOCATIONS

A. The locations of apparatus, piping and equipment indicated on the drawings are approximate. Piping and equipment shall be installed in such a manner as to avoid all obstruction, preserve headroom, and keep openings and passages clear. The locations of and mounting heights of all fixtures shall be coordinated with the architectural plans and room elevations.

B. Clearances and Openings: Contractor shall cooperate and coordinate his work with all other trades to avoid conflict and permit for a neat and orderly appearance of the entire installation. The Contractor shall, in advance of the work, furnish instructions to the General Contractor as to his requirements for equipment and material installation of any kind, whether or not specifically mentioned on drawings or in the specifications, and shall include recesses, chases in walls, and all required openings in the structure. Should furnishing this information be neglected, delayed or incorrect and additional cuttings are found to be required, the cost of the same shall be charged to this Contractor.

C. Contractor shall verify and coordinate pipe routing with location of all electrical rooms, elevator equipment rooms, telecom/data rooms, and other rooms dedicated to the housing of switchgear, panels, or other electrical equipment. In no case shall piping be installed within or above the ceiling of such rooms.

1.11 SUBMITTAL DATA

A. Submittal Requirements:

1. Furnish, all at one time, prior to any installation, within the time noted below, six (6) copies of valid submittal data on all fixtures, material, equipment and devices. Each submitted item shall be indexed and referenced to these specifications and to identification numbers on fixtures and equipment schedules.

2. Manufacturers' submittal literature and shop drawings are required on all items to ensure the latest and most complete manufacturer's data is available for review. Requirements of the submittals and Engineer's submittal notes are a part of the work of this Division except that Engineer's notes may not be used as a means of increasing the scope of work of this Division.

3. Submittals will be checked for general conformance with the design concept of the project but the review does not guarantee quantities shown and does not supersede requirements of this Division to properly install work.

4. To be valid, all submittals must:

   a. Be delivered to the Architect's office within thirty-five (35) days of award of the contract. Contractor shall make time allowance for Engineer's review, return of comments, if any, and resubmittal if required. Corrections or changes in submittals returned as inadequate or incomplete shall be accomplished within this time limit.

   b. Clearly indicate and label as such any items proposed as substitution for that specified or shown on plans.

   c. Include all pertinent construction, installation, performance and technical data.

   d. Have all product data sheets clearly labeled to indicate the individual items being submitted. In addition, all required options and accessories shall be clearly marked.

      1) Product data sheets corresponding to items indicated on plans shall be clearly labeled with the corresponding fixture or equipment tag number.

      2) Product data sheets corresponding to items indicated in specifications shall be clearly labeled with the specification section, page and item numbers.

   e. Include, for every item which differs in size, configuration, connections, service, accessibility or any other significant way, a drawing to the same (or larger) scale as to the pertinent portions of the contract drawings. In this drawing show a complete layout of the system except that which is identical to the contract drawings, unless the unchanged portions must be shown to indicate such things as clearances. This drawing, together with the contract design drawings must show the complete system as revised to accommodate the proposed alternate.

B. Substitution Requirements:

1. Any items included in submittals and proposed by the Contractor as substitution for that specified or shown on plans shall be submitted within thirty five (35) days of award of the contract. After such time, proposed substitutions shall not be accepted for review, and the Contractor shall submit all items as specified or shown on plans.

   a. For each item proposed as substitution for that specified or shown on plans, copies of product data sheets for the specified item shall be placed side by side with product data sheets for the proposed substitution item within the submittal.

1) In addition to the Submittal Requirements for labeling listed above, product data sheets for the specified item shall be clearly labeled “SPECIFIED ITEM, NOT SUBMITTED”. Product data sheets for the corresponding proposed substitution item shall be clearly labeled “PROPOSED SUBSTITUTION”.

b. Provide calculations and other detailed data justifying how any items proposed as substitution were selected for proposal. Data must be complete enough to permit detailed comparison of every significant characteristic for which the specified item was analyzed during design.

2. It shall be the Contractor’s responsibility to provide sufficient information to allow the Engineer to analyze any proposed alternate. If inadequate information is provided, the proposal will not be approved and resubmittal will not be allowed.

3. The Contractor shall provide or perform tests required by Engineer for purpose of judging acceptability of proposed substitutions.

4. The Contractor assumes full responsibility that alternate items and procedures will meet the job requirements and is responsible for cost of redesign and of modifications to this and other parts of work caused by alternate items furnished under work in this Section. In view of these responsibilities, it is the purpose of these specifications to establish procedures to ensure that the Contractor has considered all the ramifications of proposed alternates before submitting them for review. Submittals which do not comply with the requirements of these specifications or which indicate proposed alternates that were selected without proper regard to the requirements of the job will not be approved. No more than one proposed alternate will be considered for each item.

5. Alternate items installed without Engineer's approval will be replaced with specified items at Contractor's expense.

6. The Architect or his authorized representative shall be the sole judge as to the quality and suitability of proposed alternate equipment, fixtures or materials. Decisions of the Architect or that of his representative shall be final and conclusive.

1.12 QUALITY ASSURANCE

A. Structural Steel Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.13 UNINSPECTED WORK

A. The Contractor shall not allow or cause any of his work to be covered up or closed in until it has been inspected, tested, approved by all authorities have jurisdiction, and until Project Record drawings have been properly annotated.

B. Should any of his work be covered up or closed in before such inspection, he shall, at his own expense, uncover the work to the satisfaction of the inspection party. All related repair work cost shall be borne by the Contractor.

1.14 RECORD DRAWINGS

A. Contractor shall provide and keep up-to-date a complete "as-built" record set of blueline prints which shall show every change from the original drawings and the exact "as-built" locations and sizes of the work provided under this Section of the specifications. This set shall include locations, dimensions, depth of buried piping, cleanouts, shut-off valves, sewer invert locations, plugged wyes, tees, etc. On completion of the work, the Contractor shall incorporate all as-built information on a set of reproducible tracings provided by the Architect and this set of reproducibles shall be delivered to the Architect.

1.15 GUARANTEES

A. Contractor shall guarantee the entire plumbing and piping systems unconditionally for a period of one (1) year after final acceptance. If, during this period, any materials, equipment, or any part of the systems fail to function properly, the Contractor shall make good the defects promptly and without any expense to the Owner.

B. Contractor shall be responsible for all damage to any part of the premises caused by leaks in pipelines or equipment furnished and installed under this Section for a period of one (1) year after date of acceptance of his work.

C. All equipment and fixtures shall carry manufacturer's warranty against defective parts or poor workmanship for not less than one (1) year. See specific equipment specifications for extended warranty requirements.

PART 2 - PRODUCTS

2.1 Pipe Supports: Unless otherwise indicated on the drawings, shall be as follows:

A. The Contractor shall furnish and install all miscellaneous iron work including angles, channels, etc., required to appropriately support the various piping systems. Hanger spacing and location shall conform to 2025 California Plumbing Code Table 313.1.

B. All horizontal runs of piping within the building to be supported from the structural framing with steel rods and split ring hangers, B-Line, Grinnell Company, Tolco, or approved equal. Steel rods shall be secured to overhead framing with side beam connectors. Where necessary, install angle iron between framing to accommodate hanger rods. Where several pipes are running together, Unistrut, B-Line or Powerstrut channels with clamps may be used in lieu of individual pipe hangers, and supported from structure as herein specified. Submit test data for type of hanger supports to be provided. For support conditions other than specified herein, the Contractor shall submit method of support for approval prior to any installation.

C. Horizontal Piping Hangers and Supports:

1. General: Provide factory fabricated horizontal hangers and supports complying with one of the following MSS types listed to suit horizontal-piping systems, in accordance with MSS SP-69 and manufacturer's published product information. Select size of hangers and supports to exactly fit pipe size for bare piping, and to exactly fit around piping insulation with saddle or shield for insulated piping. Provide copper-plated hangers and supports for copper-piping systems.

a. Adjustable Steel Clevis Hangers: (MSS Type 1.) B-Line B 3100

b. Adjustable Swivel Pipe Rings: (MSS Type 5) B-Line B3690

D. Vertical-Piping Clamps:

1. General: Provide factory fabricated vertical-piping clamps complying with the following types listed, to suit vertical piping systems, in accordance with MSS SP-69 and manufacturer's published product information. Select size of vertical piping clamps to exactly fit pipe size of bare pipe. Provide copper-plated clamps for copper-piping systems.

2. Two-Bolt Riser Clamps: (MSS Type 8) B-Line B3373

E. Hanger-Rod Attachments:

1. General: Provide factory fabricated hanger-rod attachments B-Line, Tolco or approved equal, selected by Installer to suit horizontal-piping hangers and building attachments, in accordance with MSS SP-58 and manufacturer's published product information. Select size of hanger-rod attachment to suit hanger rods. Provide copper-plated hanger-rod attachments for copper-piping systems.

2. Side beam eye socket, Tolco Fig. #57 for rod sizes 3/8" dia. and Tolco Fig. #25-30-251 for rod sizes 1/2" dia.

F. Building Attachments:

1. General: Provide factory fabricated building attachments, selected by Installer to suit building structural framing conditions, in accordance with MSS SP-69 and manufacturer's published product information. Select size of building attachments to suit hanger rods. Provide copper-plated building attachments for copper-piping systems.

G. Hanger Rods and Spacing shall conform to the following table:

Pipe Sizes	Spacing	Rods
2 Inch and Smaller	6 Feet	3/8 Inch
2-1/2 Inch to 3 Inch	8 Feet	1/2 Inch
4 Inch and larger	8 Feet	5/8 Inch

H. Hangers and Supports shall be adequate to maintain alignment and prevent sagging and shall be placed within 18 inches of joint. Support shall be provided at each horizontal branch connection.

I. Provide lateral bracing as manufactured by B-Line or approved equal for all piping to prevent swaying or movement in accordance with SMACNA "Guidelines for Seismic Restraints of Piping Systems". Piping smaller than indicated in the guidelines shall be provided with bracing as specified for the smallest size indicated. The entire water distribution system shall be properly braced and will not move due to the action of quick closing of valves.

J. Miscellaneous Supports, Wall Brackets, Etc.: Provide where required in accordance with the best standard practices of the trade. Submit shop drawings for all fabricated supports.

2.2 Isolators. All piping which is not isolated from contact with the building by its insulation shall be installed with a manufactured type isolator. Isolators shall be B-Line vibra clamp and cushion, Super Strut, Stoneman "Trisolator", or approved equal. Piping shall be installed and supported in a manner to provide for expansion without strains. Guides shall be properly installed to ensure this requirement.

2.3 Shields:

A. General: Provide shields at piping hangers and supports, factory-fabricated, for all insulated piping as manufactured by Pipeshields Incorporated or approved equal. Size shields for exact fit to mate with pipe insulation.

1. Protection Shields: MSS Type 40; provide high density insert of same thickness of insulation or equal 100-psi average compressive strength, waterproofed calcium silicate, encased with a sheet metal shield. Insert and shield shall cover entire circumference of the pipe and shall be of length indicated by manufacturer for pipe size and thickness of insulation.

2.4 METAL PIPE HANGERS AND SUPPORTS

A. Carbon-Steel Pipe Hangers and Supports:

1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.
2. Galvanized Metallic Coatings: Pregalvanized or hot dipped.
3. Nonmetallic Coatings: Plastic coating, jacket, or liner.
4. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support bearing surface of piping.
5. Hanger Rods: Continuous-thread rod, nuts, and washer made of stainless steel.

B. Stainless-Steel Pipe Hangers and Supports:

1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.
2. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support bearing surface of piping.
3. Hanger Rods: Continuous-thread rod, nuts, and washer made of stainless steel.

C. Copper Pipe Hangers:

1. Description: MSS SP-58, Types 1 through 58, copper-coated-steel, factory-fabricated components.
2. Hanger Rods: Continuous-thread rod, nuts, and washer made of stainless steel.

2.5 TRAPEZE PIPE HANGERS

A. Description: MSS SP-69, Type 59, shop- or field-fabricated pipe-support assembly made from structural carbon-steel shapes with MSS SP-58 carbon-steel hanger rods, nuts, saddles, and U-bolts.

2.6 THERMAL-HANGER SHIELD INSERTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. ERICO International Corporation.
2. PHS Industries, Inc.
3. Pipe Shields, Inc.; a subsidiary of Piping Technology & Products, Inc.
4. Piping Technology & Products, Inc.

B. Insulation-Insert Material for Hot Piping: Water-repellent treated, ASTM C 533, Type I calcium silicate with 100-psig ASTM C 552 or Type II cellular glass with 100-psig minimum compressive strength.

C. For Trapeze or Clamped Systems: Insert and shield shall cover entire circumference of pipe.

D. For Clevis or Band Hangers: Insert and shield shall cover lower 180 degrees of pipe.

E. Insert Length: Extend 2 inches beyond sheet metal shield for piping operating below ambient air temperature.

2.7 FASTENER SYSTEMS

A. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

B. Mechanical-Expansion Anchors: Insert-wedge-type, stainless- steel anchors, for use in hardened portland cement concrete; with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

2.8 MISCELLANEOUS MATERIALS

A. Structural Steel: ASTM A 36/A 36M, carbon-steel plates, shapes, and bars; black and galvanized.

B. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, nonshrink and nonmetallic grout; suitable for interior and exterior applications.

1. Properties: Nonstaining, noncorrosive, and nongaseous.
2. Design Mix: 5000-psi, 28-day compressive strength.

PART 3 - EXECUTION

3.1 HANGER AND SUPPORT INSTALLATION

A. Metal Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from the building structure.

B. Metal Trapeze Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Arrange for grouping of parallel runs of horizontal piping, and support together on field-fabricated trapeze pipe hangers.

1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified for individual pipe hangers.

2. Field fabricate from ASTM A 36/A 36M, carbon-steel shapes selected for loads being supported. Weld steel according to AWS D1.1/D1.1M.

C. Thermal-Hanger Shield Installation: Install in pipe hanger or shield for insulated piping.

D. Fastener System Installation:

1. Install powder-actuated fasteners for use in lightweight concrete or concrete slabs less than 4 inches thick in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.

2. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.

E. Install hangers and supports complete with necessary attachments, inserts, bolts, rods, nuts, washers, and other accessories.

F. Equipment Support Installation: Fabricate from welded-structural-steel shapes.

G. 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.

H. Install lateral bracing with pipe hangers and supports to prevent swaying.

I. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, NPS 2-1/2 and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.

J. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.

K. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and to not exceed maximum pipe deflections allowed by ASME B31.9 for building services piping.

L. Insulated Piping:

1. Attach clamps and spacers to piping.

a. Piping Operating above Ambient Air Temperature: Clamp may project through insulation.

b. Piping Operating below Ambient Air Temperature: Use thermal-hanger shield insert with clamp sized to match OD of insert.

c. Do not exceed pipe stress limits allowed by ASME B31.9 for building services piping.

2. Install MSS SP-58, Type 39, protection saddles if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.

a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.

3. Shield Dimensions for Pipe: Not less than the following:

a. NPS 1/4 to NPS 3-1/2: 12 inches long and 0.048 inch thick.

b. NPS 4: 12 inches long and 0.06 inch thick.

4. Pipes NPS 8 and Larger: Include wood or reinforced calcium-silicate-insulation inserts of length at least as long as protective shield.

5. Thermal-Hanger Shields: Install with insulation same thickness as piping insulation.

3.2 EQUIPMENT SUPPORTS

A. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.

B. Grouting: Place grout under supports for equipment and make bearing surface smooth.

C. Provide lateral bracing, to prevent swaying, for equipment supports.

3.3 METAL FABRICATIONS

A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers.

B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.

C. Field Welding: Comply with AWS D1.1/D1.1M procedures for shielded, metal arc welding; appearance and quality of welds; and methods used in correcting welding work; and with the following:

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 welding flux immediately.

4. Finish welds at exposed connections so no roughness shows after finishing and so contours of welded surfaces match adjacent contours.

3.4 ADJUSTING

A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.

B. Trim excess length of continuous-thread hanger and support rods to 1-1/2 inches.

3.5 PAINTING

A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.

1. Apply paint by brush or spray to provide a minimum dry film thickness of 2.0 mils.

B. Touchup: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal are specified in Section 099123 "Interior Painting."

C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

3.6 HANGER AND SUPPORT SCHEDULE

A. Specific hanger and support requirements are in Sections specifying piping systems and equipment.

B. Comply with MSS SP-69 for pipe-hanger selections and applications that are not specified in piping system Sections.

C. Use hangers and supports with galvanized metallic coatings for piping and equipment that will not have field-applied finish.

D. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.

E. Use carbon-steel pipe hangers and supports metal trapeze pipe hangers and attachments for general service applications.

F. Use stainless-steel pipe hangers and stainless-steel attachments for hostile environment applications.

G. Use copper-plated pipe hangers and copper or stainless-steel attachments for copper piping and tubing.

H. Use thermal-hanger shield inserts for insulated piping and tubing.

I. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Adjustable, Steel Clevis Hangers (MSS Type 1): For suspension of noninsulated or insulated, stationary pipes NPS 1/2 to NPS 30.

2. Pipe Hangers (MSS Type 5): For suspension of pipes NPS 1/2 to NPS 4, to allow off-center closure for hanger installation before pipe erection.

J. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers NPS 3/4 to NPS 24.

K. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Steel Turnbuckles (MSS Type 13): For adjustment up to 6 inches for heavy loads.
2. Steel Clevises (MSS Type 14): For 120 to 450 deg F piping installations.
3. Malleable-Iron Sockets (MSS Type 16): For attaching hanger rods to various types of building attachments.
4. Steel Weldless Eye Nuts (MSS Type 17): For 120 to 450 deg F piping installations.

L. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
2. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joist construction, to attach to top flange of structural shape.
3. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.
4. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.
5. C-Clamps (MSS Type 23): For structural shapes.
6. Top-Beam Clamps (MSS Type 25): For top of beams if hanger rod is required tangent to flange edge.
7. Side-Beam Clamps (MSS Type 27): For bottom of steel I-beams.
8. Steel-Beam Clamps with Eye Nuts (MSS Type 28): For attaching to bottom of steel I-beams for heavy loads.Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.
9. Horizontal Travelers (MSS Type 58): For supporting piping systems subject to linear horizontal movement where headroom is limited.

M. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.
2. Thermal-Hanger Shield Inserts: For supporting insulated pipe.

N. Comply with MSS SP-69 for trapeze pipe-hanger selections and applications that are not specified in piping system Sections.

O. Use powder-actuated fasteners or mechanical-expansion anchors instead of building attachments where required in concrete construction.

END OF SECTION

SECTION 22 05 53

IDENITIFICATION FOR PLUMBING PIPING AND EQUIPMENT

GENERAL

1.1 SUMMARY

A. Section Includes:

1. Equipment labels.
2. Warning signs and labels.
3. Pipe labels.
4. Valve tags.
5. Warning tags.

1.2 WORK INCLUDED

A. Furnish all labor, materials, services, testing, transportation and equipment necessary for the completion of all plumbing work as indicated on drawings and specified herein. Work materials and equipment not indicated or specified which is necessary for the complete and proper operation of the work of this Section in accordance with the true intent and meaning of the contract documents shall be provided and incorporated at no additional cost to the Owner.

1.3 QUALITY ASSURANCE

A. Code Requirements: All work covered by this Section shall conform to the latest requirements of the following regulations:

1. C.C.R., Title 24, Part 5 (2025 CPC).
2. 2025 California Plumbing Code.
3. National Fire Protection Association.
4. California Division of the State Architect.
5. California State Division of Industrial Safety.
6. County Health Department.
7. Any other legally constituted body-having jurisdiction thereof.

B. Nothing in the specifications or drawings shall be construed to permit deviation from the requirements of governing codes unless approval for said deviation has been obtained from the legally constituted authorities having jurisdiction and from the Owner's representative.

1.4 DRAWINGS

A. Because of the small-scale drawings, it is not possible to indicate all offsets, fittings and accessories which may be required. The Contractor shall carefully investigate the conditions surrounding installation of his work, furnishing the necessary piping, fittings, valves, traps, and other devices which may be required to complete the installation.

B. The general arrangement indicated on the drawings shall be followed as closely as possible. Coordinate with the Architectural, Structural, Mechanical and Electrical Drawings and the work of other trades prior to installation of piping fixtures and equipment to verify adequate space available for installation of the work shown. In the event a field condition arises which makes it impossible to install the work as indicated, submit, in writing, the proposed departures to the Architect for his approval. Only when Architect's approval is given, in writing, shall Contractor proceed with installation of the work.

C. Special Note: Should the Contractor make changes in the installation differing from what is indicated on the contract drawings and not necessitated due to field conditions as indicated hereinabove, the Contractor shall be required to re-install the work to comply with what has been indicated on the contract drawings. Should it be impossible to re-install the work and the installation is in accordance with all governing authorities, the architect may permit the installation to remain. However, all costs incurred to revise the contract drawings by the engineer for resubmittal to the building department indicating the as-installed condition shall become the responsibility of the Contractor.

D. In case of a difference in the specifications or between the specifications and the drawings, the Contractor shall figure the most expensive alternate and after award of contract, shall secure direction from the Architect.

1.5 PERMITS, INSPECTIONS AND LICENSES

A. All permits, inspections and licenses required by the legally constituted authorities for installation of the work according to the plans and specifications shall be obtained and paid as a part of the work of this section.

1.6 EXAMINATION OF PREMISES

A. Before bidding on this work, Contractors shall make a careful examination of the premises and shall thoroughly familiarize themselves with the requirements of the contract. By the act of submitting a proposal for the work included in this contract, the Contractor shall be deemed to have made such study and examination, and that he is familiar with and accepts all conditions of the site.

1.7 PROTECTION

A. All work, equipment and materials shall be protected at all times. Contractor shall make good all damage caused either directly or indirectly by his own workmen. Contractor shall also protect his own work from damage. He shall close all pipe openings with caps or plugs during installation. He shall protect all his equipment and materials against dirt, water, chemical and mechanical injury. Upon completion, all work shall be thoroughly cleaned and delivered in a new condition.

B. Contractor shall be held responsible for all damage to equipment and materials until he has received written notice from the Architect or Engineer that his work has been accepted.

1.8 LOCATIONS

A. The locations of apparatus, piping and equipment indicated on the drawings are approximate. Piping and equipment shall be installed in such a manner as to avoid all obstruction, preserve headroom, and keep openings and passages clear. The locations of and mounting heights of all fixtures shall be coordinated with the architectural plans and room elevations.

B. Clearances and Openings: Contractor shall cooperate and coordinate his work with all other trades to avoid conflict and permit for a neat and orderly appearance of the entire installation. The Contractor shall, in advance of the work, furnish instructions to the General Contractor as to his requirements for equipment and material installation of any kind, whether or not specifically mentioned on drawings or in the specifications, and shall include recesses, chases in walls, and all required openings in the structure. Should furnishing this information be neglected, delayed or incorrect and additional cuttings are found to be required, the cost of the same shall be charged to this Contractor.

C. Contractor shall verify and coordinate pipe routing with location of all electrical rooms, elevator equipment rooms, telecom/data rooms, and other rooms dedicated to the housing of switchgear, panels, or other electrical equipment. In no case shall piping be installed within or above the ceiling of such rooms.

1.9 SUBMITTAL DATA

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

B. Samples: For color, letter style, and graphic representation required for each identification material and device.

C. Equipment Label Schedule: Include a listing of all equipment to be labeled with the proposed content for each label.

D. Valve numbering scheme.

E. Valve Schedules: For each piping system to include in maintenance manuals.

F. Submittal Requirements:

1. Furnish, all at one time, prior to any installation, within the time noted below, six (6) copies of valid submittal data on all fixtures, material, equipment and devices. Each submitted item shall be indexed and referenced to these specifications and to identification numbers on fixtures and equipment schedules.

2. Manufacturers' submittal literature and shop drawings are required on all items to ensure the latest and most complete manufacturer's data is available for review. Requirements of the submittals and Engineer's submittal notes are a part of the work of this Division except that Engineer's notes may not be used as a means of increasing the scope of work of this Division.

3. Submittals will be checked for general conformance with the design concept of the project but the review does not guarantee quantities shown and does not supersede requirements of this Division to properly install work.

4. To be valid, all submittals must:

a. Be delivered to the Architect's office within thirty-five (35) days of award of the contract. Contractor shall make time allowance for Engineer's review, return of comments, if any, and resubmittal if required. Corrections or changes in submittals returned as inadequate or incomplete shall be accomplished within this time limit.

b. Clearly indicate and label as such any items proposed as substitution for that specified or shown on plans.

c. Include all pertinent construction, installation, performance and technical data.

d. Have all product data sheets clearly labeled to indicate the individual items being submitted. In addition, all required options and accessories shall be clearly marked.

1) Product data sheets corresponding to items indicated on plans shall be clearly labeled with the corresponding fixture or equipment tag number.

2) Product data sheets corresponding to items indicated in specifications shall be clearly labeled with the specification section, page and item numbers.

e. Include, for every item which differs in size, configuration, connections, service, accessibility or any other significant way, a drawing to the same (or larger) scale as to the pertinent portions of the contract drawings. In this drawing show a complete layout of the system except that which is identical to the contract drawings, unless the unchanged portions must be shown to indicate such things as clearances. This drawing, together with the contract design drawings must show the complete system as revised to accommodate the proposed alternate.

G. Substitution Requirements:

1. Any items included in submittals and proposed by the Contractor as substitution for that specified or shown on plans shall be submitted within thirty five (35) days of award of the contract. After such time, proposed substitutions shall not be accepted for review, and the Contractor shall submit all items as specified or shown on plans.

a. For each item proposed as substitution for that specified or shown on plans, copies of product data sheets for the specified item shall be placed side by side with product data sheets for the proposed substitution item within the submittal.

1) In addition to the Submittal Requirements for labeling listed above, product data sheets for the specified item shall be clearly labeled "SPECIFIED ITEM, NOT SUBMITTED". Product data sheets for the corresponding proposed substitution item shall be clearly labeled "PROPOSED SUBSTITUTION".

b. Provide calculations and other detailed data justifying how any items proposed as substitution were selected for proposal. Data must be complete enough to permit detailed comparison of every significant characteristic for which the specified item was analyzed during design.

2. It shall be the Contractor's responsibility to provide sufficient information to allow the Engineer to analyze any proposed alternate. If inadequate information is provided, the proposal will not be approved and resubmittal will not be allowed.

3. The Contractor shall provide or perform tests required by Engineer for purpose of judging acceptability of proposed substitutions.

4. The Contractor assumes full responsibility that alternate items and procedures will meet the job requirements and is responsible for cost of redesign and of modifications to this and other parts of work caused by alternate items furnished under work in this Section. In view of these responsibilities, it is the purpose of these specifications to establish procedures to ensure that the Contractor has considered all the ramifications of proposed alternates before submitting them for review. Submittals which do not comply with the requirements of these specifications or which indicate proposed alternates that were selected without proper regard to the requirements of the job will not be approved. No more than one proposed alternate will be considered for each item.

5. Alternate items installed without Engineer's approval will be replaced with specified items at Contractor's expense.

6. The Architect or his authorized representative shall be the sole judge as to the quality and suitability of proposed alternate equipment, fixtures or materials. Decisions of the Architect or that of his representative shall be final and conclusive.

1.10 COORDINATION

A. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.

B. Coordinate installation of identifying devices with locations of access panels and doors.

C. Install identifying devices before installing acoustical ceilings and similar concealment.

1.11 UNINSPECTED WORK

A. The Contractor shall not allow or cause any of his work to be covered up or closed in until it has been inspected, tested, approved by all authorities have jurisdiction, and until Project Record drawings have been properly annotated.

B. Should any of his work be covered up or closed in before such inspection, he shall, at his own expense, uncover the work to the satisfaction of the inspection party. All related repair work cost shall be borne by the Contractor.

1.12 RECORD DRAWINGS (Also see General Conditions)

A. Contractor shall provide and keep up-to-date a complete "as-built" record set of blueline prints which shall show every change from the original drawings and the exact "as-built" locations and sizes of the work provided under this Section of the specifications. This set shall include locations, dimensions, depth of buried piping, cleanouts, shut-off valves, sewer invert locations, plugged wyes, tees, etc. On completion of the work, the Contractor shall incorporate all as-built information on a set of reproducible tracings provided by the Architect and this set of reproducibles shall be delivered to the Architect.

1.13 GUARANTEES

A. Contractor shall guarantee the entire plumbing and piping systems unconditionally for a period of one (1) year after final acceptance. If, during this period, any materials, equipment, or any part of the systems fail to function properly, the Contractor shall make good the defects promptly and without any expense to the Owner.

B. Contractor shall be responsible for all damage to any part of the premises caused by leaks in pipelines or equipment furnished and installed under this Section for a period of one (1) year after date of acceptance of his work.

C. All equipment and fixtures shall carry manufacturer's warranty against defective parts or poor workmanship for not less than one (1) year. See specific equipment specifications for extended warranty requirements.

PART 2 - PRODUCTS

2.1 EQUIPMENT LABELS

A. Metal Labels for Equipment:

Material and Thickness: Brass, 0.032-inch minimum thickness, and having predrilled or stamped holes for attachment hardware.

2. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.

3. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.

4. Fasteners: Stainless-steel rivets or self-tapping screws.

5. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

Label Content: Include equipment's Drawing designation or unique equipment number, Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified.

C. Equipment Label Schedule: For each item of equipment to be labeled, on 8-1/2-by-11-inch bond paper. Tabulate equipment identification number and identify Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified. Equipment schedule shall be included in operation and maintenance data.

2.2 WARNING SIGNS AND LABELS

A. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.

B. Letter Color: Black.

C. Background Color: White.

D. Maximum Temperature: Able to withstand temperatures up to 160 deg F.

E. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.

F. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.

G. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

Label Content: Include caution and warning information, plus emergency notification instructions.

2.3 PIPE LABELS

General Requirements for Manufactured Pipe Labels: Preprinted, color-coded, with lettering indicating service, and showing flow direction.

B. Pretensioned Pipe Labels: Precoiled, semirigid plastic formed to cover full circumference of pipe and to attach to pipe without fasteners or adhesive.

C. Self-Adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing.

D. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings, pipe size, and an arrow indicating flow direction.

1. Flow-Direction Arrows: Integral with piping system service lettering to accommodate both directions, or as separate unit on each pipe label to indicate flow direction.

2. Lettering Size: At least 1-1/2 incheshigh.

2.4 VALVE TAGS

Valve Tags: Stamped or engraved with 1/4-inch letters for piping system abbreviation and 1/2-inch numbers.

1. Tag Material: Brass, 0.032-inch minimum thickness, and having predrilled or stamped holes for attachment hardware.

2. Fasteners: Brass wire-link or beaded chain; or S-hook.

B. Valve Schedules: For each piping system, on 8-1/2-by-11-inch bond paper. Tabulate valve number, piping system, system abbreviation (as shown on valve tag), location of valve (room or space), normal-operating position (open, closed, or modulating), and variations for identification. Mark valves for emergency shutoff and similar special uses.

1. Valve-tag schedule shall be included in operation and maintenance data.

2.5 WARNING TAGS

A. Warning Tags: Preprinted or partially preprinted, accident-prevention tags, of plasticized card stock with matte finish suitable for writing.

1. Size: 3 by 5-1/4 inches minimum.

2. Fasteners: Brass grommet and wire.

3. Nomenclature: Large-size primary caption such as "DANGER," "CAUTION," or "DO NOT OPERATE."
4. Color: Yellow background with black lettering.

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.

3.2 EQUIPMENT LABEL INSTALLATION

A. Install or permanently fasten labels on each major item of mechanical equipment.

B. Locate equipment labels where accessible and visible.

3.3 PIPE LABEL INSTALLATION

Piping Color-Coding: Painting of piping is specified in Section 099123 "Interior Painting."

Stenciled Pipe Label Option: Stenciled labels may be provided instead of manufactured pipe labels, at Installer's option. Install stenciled pipe labels with painted, color-coded bands or rectangles on each piping system.

1. Identification Paint: Use for contrasting background.
2. Stencil Paint: Use for pipe marking.

Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior exposed locations as follows:

1. Near each valve and control device.
2. Near each branch connection, excluding short takeoffs for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.
3. Near penetrations through walls, floors, ceilings, and inaccessible enclosures.
4. At access doors, manholes, and similar access points that permit view of concealed piping.
5. Near major equipment items and other points of origination and termination.
6. Spaced at maximum intervals of 50 feet along each run. Reduce intervals to 25 feet in areas of congested piping and equipment.
7. On piping above removable acoustical ceilings. Omit intermediately spaced labels.

D. Pipe Label Color Schedule:

1. Domestic Water Piping:
   a. Background Color: White.
   b. Letter Color: Black.

2. Sanitary Waste and Storm Drainage Piping:

a. Background Color: White.

b. Letter Color: Black.

3.4 VALVE-TAG INSTALLATION

Install tags on valves and control devices in piping systems, except check valves; valves within factory-fabricated equipment units; shutoff valves; faucets; convenience and lawn-watering hose connections; and similar roughing-in connections of end-use fixtures and units. List tagged valves in a valve schedule.

B. Valve-Tag Application Schedule: Tag valves according to size, shape, and color scheme and with captions similar to those indicated in the following subparagraphs:

Valve-Tag Size and Shape:

a. Cold Water: 1-1/2 inches, round.

b. Hot Water: 1-1/2 inches, round.

Valve-Tag Color:

a. Cold Water: Natural.

b. Hot Water: Natural.

3. Letter Color:

a. Cold Water: Black.

b. Hot Water: Black.

3.5 WARNING-TAG INSTALLATION

A. Write required message on, and attach warning tags to, equipment and other items where required.

END OF SECTION

SECTION 22 07 19
PLUMBING PIPING INSULATION

GENERAL

1.1 SUMMARY

A. Section includes insulating the following plumbing piping services:

Domestic cold-water piping.

2. Domestic hot-water piping.
3. Supplies and drains for handicap-accessible lavatories and sinks.

1.2 WORK INCLUDED

A. Furnish all labor, materials, services, testing, transportation and equipment necessary for the completion of all plumbing work as indicated on drawings and specified herein. Work materials and equipment not indicated or specified which is necessary for the complete and proper operation of the work of this Section in accordance with the true intent and meaning of the contract documents shall be provided and incorporated at no additional cost to the Owner.

1.3 QUALITY ASSURANCE

A. Code Requirements: All work covered by this Section shall conform to the latest requirements of the following regulations:

1. C.C.R., Title 24, Part 5 (2025 CPC).
2. 2025 California Plumbing Code.
3. National Fire Protection Association.
4. California Division of the State Architect.
5. California State Division of Industrial Safety.
6. County Health Department.
7. Any other legally constituted body-having jurisdiction thereof.

B. Nothing in the specifications or drawings shall be construed to permit deviation from the requirements of governing codes unless approval for said deviation has been obtained from the legally constituted authorities having jurisdiction and from the Owner's representative.

1.4 DRAWINGS

A. Because of the small-scale drawings, it is not possible to indicate all offsets, fittings and accessories which may be required. The Contractor shall carefully investigate the conditions surrounding installation of his work, furnishing the necessary piping, fittings, valves, traps, and other devices which may be required to complete the installation.

B. The general arrangement indicated on the drawings shall be followed as closely as possible. Coordinate with the Architectural, Structural, Mechanical and Electrical Drawings and the work of other trades prior to installation of piping fixtures and equipment to verify adequate space available for installation of the work shown. In the event a field condition arises which makes it impossible to install the work as indicated, submit, in writing, the proposed departures to the Architect for his approval. Only when Architect's approval is given, in writing, shall Contractor proceed with installation of the work.

C. Special Note: Should the Contractor make changes in the installation differing from what is indicated on the contract drawings and not necessitated due to field conditions as indicated hereinabove, the Contractor shall be required to re-install the work to comply with what has been indicated on the contract drawings. Should it be impossible to re-install the work and the installation is in accordance with all governing authorities, the architect may permit the installation to remain. However, all costs incurred to revise the contract drawings by the engineer for resubmittal to the building department indicating the as-installed condition shall become the responsibility of the Contractor.

D. In case of a difference in the specifications or between the specifications and the drawings, the Contractor shall figure the most expensive alternate and after award of contract, shall secure direction from the Architect.

1.5 PERMITS, INSPECTIONS AND LICENSES

A. All permits, inspections and licenses required by the legally constituted authorities for installation of the work according to the plans and specifications shall be obtained and paid as a part of the work of this section.

1.6 EXAMINATION OF PREMISES

A. Before bidding on this work, Contractors shall make a careful examination of the premises and shall thoroughly familiarize themselves with the requirements of the contract. By the act of submitting a proposal for the work included in this contract, the Contractor shall be deemed to have made such study and examination, and that he is familiar with and accepts all conditions of the site.

1.7 PROTECTION

A. All work, equipment and materials shall be protected at all times. Contractor shall make good all damage caused either directly or indirectly by his own workmen. Contractor shall also protect his own work from damage. He shall close all pipe openings with caps or plugs during installation. He shall protect all his equipment and materials against dirt, water, chemical and mechanical injury. Upon completion, all work shall be thoroughly cleaned and delivered in a new condition.

B. Contractor shall be held responsible for all damage to equipment and materials until he has received written notice from the Architect or Engineer that his work has been accepted.

1.8 LOCATIONS

A. The locations of apparatus, piping and equipment indicated on the drawings are approximate. Piping and equipment shall be installed in such a manner as to avoid all obstruction, preserve headroom, and keep openings and passages clear. The locations of and mounting heights of all fixtures shall be coordinated with the architectural plans and room elevations.

B. Clearances and Openings: Contractor shall cooperate and coordinate his work with all other trades to avoid conflict and permit for a neat and orderly appearance of the entire installation. The Contractor shall, in advance of the work, furnish instructions to the General Contractor as to his requirements for equipment and material installation of any kind, whether or not specifically mentioned on drawings or in the specifications, and shall include recesses, chases in walls, and all required openings in the structure. Should furnishing this information be neglected, delayed or incorrect and additional cuttings are found to be required, the cost of the same shall be charged to this Contractor.

C. Contractor shall verify and coordinate pipe routing with location of all electrical rooms, elevator equipment rooms, telecom/data rooms, and other rooms dedicated to the housing of switchgear, panels, or other electrical equipment. In no case shall piping be installed within or above the ceiling of such rooms.

1.9 SUBMITTAL DATA

A. Submittal Requirements:

1. Furnish, all at one time, prior to any installation, within the time noted below, six (6) copies of valid submittal data on all fixtures, material, equipment and devices. Each submitted item shall be indexed and referenced to these specifications and to identification numbers on fixtures and equipment schedules.
2. Manufacturers' submittal literature and shop drawings are required on all items to ensure the latest and most complete manufacturer's data is available for review. Requirements of the submittals and Engineer's submittal notes are a part of the work of this Division except that Engineer's notes may not be used as a means of increasing the scope of work of this Division.
3. Submittals will be checked for general conformance with the design concept of the project but the review does not guarantee quantities shown and does not supersede requirements of this Division to properly install work.
4. To be valid, all submittals must:
    a. Be delivered to the Architect's office within thirty-five (35) days of award of the contract. Contractor shall make time allowance for Engineer's review, return of comments, if any, and resubmittal if required. Corrections or changes in submittals returned as inadequate or incomplete shall be accomplished within this time limit.
    b. Clearly indicate and label as such any items proposed as substitution for that specified or shown on plans.
    c. Include all pertinent construction, installation, performance and technical data.

d. Have all product data sheets clearly labeled to indicate the individual items being submitted. In addition, all required options and accessories shall be clearly marked.

1) Product data sheets corresponding to items indicated on plans shall be clearly labeled with the corresponding fixture or equipment tag number.

2) Product data sheets corresponding to items indicated in specifications shall be clearly labeled with the specification section, page and item numbers.

e. Include, for every item which differs in size, configuration, connections, service, accessibility or any other significant way, a drawing to the same (or larger) scale as to the pertinent portions of the contract drawings. In this drawing show a complete layout of the system except that which is identical to the contract drawings, unless the unchanged portions must be shown to indicate such things as clearances. This drawing, together with the contract design drawings must show the complete system as revised to accommodate the proposed alternate.

B. Substitution Requirements:

1. Any items included in submittals and proposed by the Contractor as substitution for that specified or shown on plans shall be submitted within thirty five (35) days of award of the contract. After such time, proposed substitutions shall not be accepted for review, and the Contractor shall submit all items as specified or shown on plans.

a. For each item proposed as substitution for that specified or shown on plans, copies of product data sheets for the specified item shall be placed side by side with product data sheets for the proposed substitution item within the submittal.

1) In addition to the Submittal Requirements for labeling listed above, product data sheets for the specified item shall be clearly labeled “SPECIFIED ITEM, NOT SUBMITTED”. Product data sheets for the corresponding proposed substitution item shall be clearly labeled “PROPOSED SUBSTITUTION”.

b. Provide calculations and other detailed data justifying how any items proposed as substitution were selected for proposal. Data must be complete enough to permit detailed comparison of every significant characteristic for which the specified item was analyzed during design.

2. It shall be the Contractor’s responsibility to provide sufficient information to allow the Engineer to analyze any proposed alternate. If inadequate information is provided, the proposal will not be approved and resubmittal will not be allowed.

3. The Contractor shall provide or perform tests required by Engineer for purpose of judging acceptability of proposed substitutions.

4. The Contractor assumes full responsibility that alternate items and procedures will meet the job requirements and is responsible for cost of redesign and of modifications to this and other parts of work caused by alternate items furnished under work in this Section. In view of these responsibilities, it is the purpose of these specifications to establish procedures to ensure that the Contractor has considered all the ramifications of proposed

alternates before submitting them for review. Submittals which do not comply with the requirements of these specifications or which indicate proposed alternates that were selected without proper regard to the requirements of the job will not be approved. No more than one proposed alternate will be considered for each item.

5. Alternate items installed without Engineer's approval will be replaced with specified items at Contractor's expense.

INFORMATIONAL SUBMITTALS

Qualification Data: For qualified Installer.

Material Test Reports: From a qualified testing agency acceptable to authorities having jurisdiction indicating, interpreting, and certifying test results for compliance of insulation materials, sealers, attachments, cements, and jackets, with requirements indicated. Include dates of tests and test methods employed.

Field quality-control reports.

1.11 QUALITY ASSURANCE

Installer Qualifications: Skilled mechanics who have successfully completed an apprenticeship program or another craft training program certified by the Department of Labor, Bureau of Apprenticeship and Training.

Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products according to ASTM E 84 by a testing agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing agency.

1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.

Comply with the following applicable standards and other requirements specified for miscellaneous components:

1. Supply and Drain Protective Shielding Guards: ICC A117.1.

1.12 UNINSPECTED WORK

A. The Contractor shall not allow or cause any of his work to be covered up or closed in until it has been inspected, tested, approved by all authorities have jurisdiction, and until Project Record drawings have been properly annotated.

B. Should any of his work be covered up or closed in before such inspection, he shall, at his own expense, uncover the work to the satisfaction of the inspection party. All related repair work cost shall be borne by the Contractor.

1.13 RECORD DRAWINGS (Also see General Conditions)

A. Contractor shall provide and keep up-to-date a complete "as-built" record set of blueline prints which shall show every change from the original drawings and the exact "as-built" locations and sizes of the work provided under this Section of the specifications. This set shall include locations, dimensions, depth of buried piping, cleanouts, shut-off valves, sewer invert locations, plugged wyes, tees, etc. On completion of the work, the Contractor shall incorporate all as-built information on a set of reproducible tracings provided by the Architect and this set of reproducibles shall be delivered to the Architect.

1.14 GUARANTEES

A. Contractor shall guarantee the entire plumbing and piping systems unconditionally for a period of one (1) year after final acceptance. If, during this period, any materials, equipment, or any part of the systems fail to function properly, the Contractor shall make good the defects promptly and without any expense to the Owner.

B. Contractor shall be responsible for all damage to any part of the premises caused by leaks in pipelines or equipment furnished and installed under this Section for a period of one (1) year after date of acceptance of his work.

C. All equipment and fixtures shall carry manufacturer's warranty against defective parts or poor workmanship for not less than one (1) year. See specific equipment specifications for extended warranty requirements.

1.15 DELIVERY, STORAGE, AND HANDLING

Packaging: Insulation material containers shall be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.

1.16 COORDINATION

A. Coordinate sizes and locations of supports, hangers, and insulation shields specified in Section 220529 "Hangers and Supports for Plumbing Piping and Equipment."

B. Coordinate clearance requirements with piping Installer for piping insulation application. Before preparing piping Shop Drawings, establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.

C. Coordinate installation and testing of heat tracing.

1.17 SCHEDULING

A. Schedule insulation application after pressure testing systems and, where required, after installing and testing heat tracing. Insulation application may begin on segments that have satisfactory test results.

B. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS

A. Hot Water Pipe Insulation: All hot water supply and return piping, except exposed connections to plumbing fixtures, flanges and unions shall be insulated with ASTM C547, Class I, "Johns-Manville" "Micro-Lock" 850-APT, Owens-Corning Fiberglass Corp., ASJ/SL-11 or approved equal, 1" thick for sizes up to 1" and 1-1/2" thick for sizes 1 1/4" and larger with “Johns-Manville” “Zeston” pre-formed insulation inserts for all fittings. Insulation at all fittings shall be equal in thickness to insulation for piping. Insulation shall have a flame spread of not more than 25 and a smoke density not exceeding 50 per 2025 CMC

1. Exposed insulated piping in occupied areas and exposed outside the building shall be covered with Johns-Manville” “Zeston” 30-mil thick white PVC jacketing material per ASTM D1784 with “Johns-Manville” “Zeston” pre-formed insulation inserts for all fittings. Insulation at all fittings shall be equal in thickness to insulation for piping. Jacketing shall comply with ASTM E84, and shall have a flame spread of not more than 25 and a smoke density not exceeding 50 per 2025 CMC.
2. Hot water piping below slab shall have insulation protected by a 10-mil thick polyethylene plastic sleeve sealed watertight with poly vinyl chloride tape.

Comply with requirements in "Piping Insulation Schedule, General," "Indoor Piping Insulation Schedule," "Outdoor, Aboveground Piping Insulation Schedule," and "Outdoor, Underground Piping Insulation Schedule" articles for where insulating materials shall be applied.

Products shall not contain asbestos, lead, mercury, or mercury compounds.

D. Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871.

E. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.

F. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.

Mineral-Fiber, Preformed Pipe Insulation:

Products: Subject to compliance with requirements, provide one of the following:

a. Johns Manville; Micro-Lok.
b. Knauf Insulation; 1000-Degree Pipe Insulation.
c. Owens Corning; Fiberglas Pipe Insulation.

Type I, 850 Deg F Materials: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 547, Type I, Grade A, with factory-applied ASJ. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

Polyolefin: Unicellular, polyethylene thermal plastic insulation. Comply with ASTM C 534 or ASTM C 1427, Type I, Grade 1 for tubular materials.

Products: Subject to compliance with requirements, provide one of the following:

a. Armacell LLC; Tubolit.

b. Nomaco Insulation; IMCOLOCK and NOMALOCK.

I. Condensate Pipe Insulation: All condensate piping within the building shall be insulated with "Imcoa" "Imcolock" ¾" nominal wall thickness closed-cell insulation. Insulation shall have a flame spread of not more than 25 and a smoke density not exceeding 50 per 2022 CMC. All joints shall be mitered and secured with black duct tape.

J. All insulation shall be continuous through supports and hangers.

K. All fixtures complying with the provisions of the Americans with Disabilities Act shall be provided with Prowrap insulation for exposed hot water pipe, tailpiece, and trap as manufactured by McGuire, and secured per manufacturers recommendations. No tape wrapping shall be permitted.

ADHESIVES

Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated, unless otherwise indicated.

Mineral-Fiber Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.

Products: Subject to compliance with requirements, provide one of the following:

a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-127.

b. Eagle Bridges - Marathon Industries; 225.

c. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 85-60/85-70.

For indoor applications, adhesive shall have a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

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. Phenolic Adhesive: Solvent-based resin adhesive, with a service temperature range of minus 75 to plus 300 deg F.

Products: Subject to compliance with requirements, provide one of the following:

a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-96.

b. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 81-33.

For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

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."

D. ASJ Adhesive, and FSK Jacket Adhesive: Comply with MIL-A-3316C, Class 2, Grade A for bonding insulation jacket lap seams and joints.

Products: Subject to compliance with requirements, provide one of the following:

a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-82.

b. Eagle Bridges - Marathon Industries; 225.

c. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 85-20.

For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

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."

E. PVC Jacket Adhesive: Compatible with PVC jacket.

Products: Subject to compliance with requirements, provide the following:

a. Johns Manville; Zeston Perma-Weld, CEEL-TITE Solvent Welding Adhesive.

For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

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."

2.3 TAPES

ASJ Tape: White vapor-retarder tape matching factory-applied jacket with acrylic adhesive, complying with ASTM C 1136.

Products: Subject to compliance with requirements, provide one of the following:

a. ABI, Ideal Tape Division; 428 AWF ASJ.

b. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0836.

c. Compac Corporation; 104 and 105.

d. Venture Tape; 1540 CW Plus, 1542 CW Plus, and 1542 CW Plus/SQ.

2. Width: 3 inches.

3. Thickness: 11.5 mils.

4. Adhesion: 90 ounces force/inch in width.

5. Elongation: 2 percent.

6. Tensile Strength: 40 lbf/inch in width.

7. ASJ Tape Disks and Squares: Precut disks or squares of ASJ tape.

B. PVC Tape: White vapor-retarder tape matching field-applied PVC jacket with acrylic adhesive; suitable for indoor and outdoor applications.

Products: Subject to compliance with requirements, provide one of the following:

a. ABI, Ideal Tape Division; 370 White PVC tape.

b. Compac Corporation; 130.

c. Venture Tape; 1506 CW NS.

2. Width: 2 inches.

3. Thickness: 6 mils.

4. Adhesion: 64 ounces force/inch in width.

5. Elongation: 500 percent.

6. Tensile Strength: 18 lbf/inch in width.

2.4 SECUREMENTS

A. Staples: Outward-clinching insulation staples, nominal 3/4-inch- wide, stainless steel or Monel.

PROTECTIVE SHIELDING GUARDS

A. Protective Shielding Pipe Covers,:

Manufacturers: Subject to compliance with requirements, provide products by the following:

a. McGuire Manufacturing.

2. Description: Manufactured plastic wraps for covering plumbing fixture hot- and cold-water supplies and trap and drain piping. Comply with Americans with Disabilities Act (ADA) requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of insulation application.

1. Verify that systems to be insulated have been tested and are free of defects.

2. Verify that surfaces to be insulated are clean and dry.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

B. Surface Preparation: Clean and prepare surfaces to be insulated. Before insulating, apply a corrosion coating to insulated surfaces as follows:

1. Stainless Steel: Coat 300 series stainless steel with an epoxy primer 5 mils thick and an epoxy finish 5 mils thick if operating in a temperature range between 140 and 300 deg F. Consult coating manufacturer for appropriate coating materials and application methods for operating temperature range.
2. Carbon Steel: Coat carbon steel operating at a service temperature between 32 and 300 deg F with an epoxy coating. Consult coating manufacturer for appropriate coating materials and application methods for operating temperature range.

C. Coordinate insulation installation with the trade installing heat tracing. Comply with requirements for heat tracing that apply to insulation.

D. Mix insulating cements with clean potable water; if insulating cements are to be in contact with stainless-steel surfaces, use demineralized water.

3.3 GENERAL INSTALLATION REQUIREMENTS

A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of piping including fittings, valves, and specialties.

B. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of pipe system as specified in insulation system schedules.

C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.

D. Install insulation with longitudinal seams at top and bottom of horizontal runs.

E. Install multiple layers of insulation with longitudinal and end seams staggered.

F. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.

G. Keep insulation materials dry during application and finishing.

H. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.

I. Install insulation with least number of joints practical.

J. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.

1. Install insulation continuously through hangers and around anchor attachments.
2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends at attachment to structure with vapor-barrier mastic.
3. Install insert materials and install insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.
4. Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect jacket from tear or puncture by hanger, support, and shield.

K. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.

L. Install insulation with factory-applied jackets as follows:

1. Draw jacket tight and smooth.
2. Cover circumferential joints with 3-inch- wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip, spaced 4 inches o.c.
3. Overlap jacket longitudinal seams at least 1-1/2 inches. Install insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 2 inches o.c.
    a. For below-ambient services, apply vapor-barrier mastic over staples.
4. Cover joints and seams with tape, according to insulation material manufacturer's written instructions, to maintain vapor seal.
5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to pipe flanges and fittings.

M. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.

N. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.

O. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.

P. For above-ambient services, do not install insulation to the following:

1. Vibration-control devices.
2. Testing agency labels and stamps.
3. Nameplates and data plates.
4. Cleanouts.

3.4 PENETRATIONS

A. Insulation Installation at Roof Penetrations: Install insulation continuously through roof penetrations.

1. Seal penetrations with flashing sealant.
2. For applications requiring only indoor insulation, terminate insulation above roof surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
3. Extend jacket of outdoor insulation outside roof flashing at least 2 inches below top of roof flashing.

4. Seal jacket to roof flashing with flashing sealant.

B. Insulation Installation at Underground Exterior Wall Penetrations: Terminate insulation flush with sleeve seal. Seal terminations with flashing sealant.

C. Insulation Installation at Aboveground Exterior Wall Penetrations: Install insulation continuously through wall penetrations.

1. Seal penetrations with flashing sealant.
2. For applications requiring only indoor insulation, terminate insulation inside wall surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
3. Extend jacket of outdoor insulation outside wall flashing and overlap wall flashing at least 2 inches.
4. Seal jacket to wall flashing with flashing sealant.

D. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.

E. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Install insulation continuously through penetrations of fire-rated walls and partitions.

F. Insulation Installation at Floor Penetrations:

1. Pipe: Install insulation continuously through floor penetrations.

3.5 GENERAL PIPE INSULATION INSTALLATION

A. Requirements in this article generally apply to all insulation materials except where more specific requirements are specified in various pipe insulation material installation articles.

Insulation Installation on Fittings, Valves, Strainers, Flanges, and Unions:

1. Install insulation over fittings, valves, strainers, flanges, unions, and other specialties with continuous thermal and vapor-retarder integrity unless otherwise indicated.
2. Insulate pipe elbows using preformed fitting insulation or mitered fittings made from same material and density as adjacent pipe insulation. Each piece shall be butted tightly against adjoining piece and bonded with adhesive. Fill joints, seams, voids, and irregular surfaces with insulating cement finished to a smooth, hard, and uniform contour that is uniform with adjoining pipe insulation.
3. Insulate tee fittings with preformed fitting insulation or sectional pipe insulation of same material and thickness as used for adjacent pipe. Cut sectional pipe insulation to fit. Butt each section closely to the next and hold in place with tie wire. Bond pieces with adhesive.
4. Insulate valves using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. For valves, insulate up to and including the bonnets, valve stuffing-box studs, bolts, and nuts. Fill joints, seams, and irregular surfaces with insulating cement.

5. Insulate strainers using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. Fill joints, seams, and irregular surfaces with insulating cement. Insulate strainers so strainer basket flange or plug can be easily removed and replaced without damaging the insulation and jacket. Provide a removable reusable insulation cover. For below-ambient services, provide a design that maintains vapor barrier.
6. Insulate flanges and unions using a section of oversized preformed pipe insulation. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker.
7. Cover segmented insulated surfaces with a layer of finishing cement and coat with a mastic. Install vapor-barrier mastic for below-ambient services and a breather mastic for above-ambient services. Reinforce the mastic with fabric-reinforcing mesh. Trowel the mastic to a smooth and well-shaped contour.
8. For services not specified to receive a field-applied jacket except for flexible elastomeric and polyolefin, install fitted PVC cover over elbows, tees, strainers, valves, flanges, and unions. Terminate ends with PVC end caps. Tape PVC covers to adjoining insulation facing using PVC tape.
9. Stencil or label the outside insulation jacket of each union with the word "union." Match size and color of pipe labels.

C. Insulate instrument connections for thermometers, pressure gages, pressure temperature taps, test connections, flow meters, sensors, switches, and transmitters on insulated pipes. Shape insulation at these connections by tapering it to and around the connection with insulating cement and finish with finishing cement, mastic, and flashing sealant.

Install removable insulation covers at locations indicated. Installation shall conform to the following:

1. Make removable flange and union insulation from sectional pipe insulation of same thickness as that on adjoining pipe. Install same insulation jacket as adjoining pipe insulation.
2. When flange and union covers are made from sectional pipe insulation, extend insulation from flanges or union long at least two times the insulation thickness over adjacent pipe insulation on each side of flange or union. Secure flange cover in place with stainless-steel or aluminum bands. Select band material compatible with insulation and jacket.
3. Construct removable valve insulation covers in same manner as for flanges, except divide the two-part section on the vertical center line of valve body.
4. When covers are made from block insulation, make two halves, each consisting of mitered blocks wired to stainless-steel fabric. Secure this wire frame, with its attached insulation, to flanges with tie wire. Extend insulation at least 2 inches over adjacent pipe insulation on each side of valve. Fill space between flange or union cover and pipe insulation with insulating cement. Finish cover assembly with insulating cement applied in two coats. After first coat is dry, apply and trowel second coat to a smooth finish.

5. Unless a PVC jacket is indicated in field-applied jacket schedules, finish exposed surfaces with a metal jacket.

3.6 INSTALLATION OF MINERAL-FIBER INSULATION

A. Insulation Installation on Straight Pipes and Tubes:

1. Secure each layer of preformed pipe insulation to pipe with wire or bands and tighten bands without deforming insulation materials.
2. Where vapor barriers are indicated, seal longitudinal seams, end joints, and protrusions with vapor-barrier mastic and joint sealant.
3. For insulation with factory-applied jackets on above-ambient surfaces, secure laps with outward clinched staples at 6 inches o.c.
4. For insulation with factory-applied jackets on below-ambient surfaces, do not staple longitudinal tabs. Instead, secure tabs with additional adhesive as recommended by insulation material manufacturer and seal with vapor-barrier mastic and flashing sealant.

B. Insulation Installation on Pipe Flanges:

1. Install preformed pipe insulation to outer diameter of pipe flange.
2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with mineral-fiber blanket insulation.
4. Install jacket material with manufacturer's recommended adhesive, overlap seams at least 1 inch, and seal joints with flashing sealant.

C. Insulation Installation on Pipe Fittings and Elbows:

1. Install preformed sections of same material as straight segments of pipe insulation when available.
2. When preformed insulation elbows and fittings are not available, install mitered sections of pipe insulation, to a thickness equal to adjoining pipe insulation. Secure insulation materials with wire or bands.

D. Insulation Installation on Valves and Pipe Specialties:

1. Install preformed sections of same material as straight segments of pipe insulation when available.
2. When preformed sections are not available, install mitered sections of pipe insulation to valve body.
3. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
4. Install insulation to flanges as specified for flange insulation application.

3.7 INSTALLATION OF POLYOLEFIN INSULATION

A. Insulation Installation on Straight Pipes and Tubes:

1. Seal split-tube longitudinal seams and end joints with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

B. Insulation Installation on Pipe Flanges:

1. Install pipe insulation to outer diameter of pipe flange.
2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of polyolefin sheet insulation of same thickness as pipe insulation.
4. Secure insulation to flanges and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

C. Insulation Installation on Pipe Fittings and Elbows:

1. Install mitered sections of polyolefin pipe insulation.
2. Secure insulation materials and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

D. Insulation Installation on Valves and Pipe Specialties:

1. Install cut sections of polyolefin pipe and sheet insulation to valve body.
2. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
3. Install insulation to flanges as specified for flange insulation application.
4. Secure insulation to valves and specialties, and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

3.8 FINISHES

Insulation with ASJ, Glass-Cloth, or Other Paintable Jacket Material: Paint jacket with paint system identified below and as specified in Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."

Flat Acrylic Finish: Two finish coats over a primer that is compatible with jacket material and finish coat paint. Add fungicidal agent to render fabric mildew proof.

a. Finish Coat Material: Interior, flat, latex-emulsion size.

B. Flexible Elastomeric Thermal Insulation: After adhesive has fully cured, apply two coats of insulation manufacturer's recommended protective coating.

C. Color: Final color as selected by Architect. Vary first and second coats to allow visual inspection of the completed Work.

D. Do not field paint aluminum or stainless-steel jackets.

3.9 FIELD QUALITY CONTROL

Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

Perform tests and inspections.

Tests and Inspections:

1. Inspect pipe, fittings, strainers, and valves, randomly selected by Architect, by removing field-applied jacket and insulation in layers in reverse order of their installation. Extent of inspection shall be limited to three locations of straight pipe, three locations of threaded fittings, three locations of welded fittings, three locations of threaded valves, and three locations of flanged valves for each pipe service defined in the "Piping Insulation Schedule, General" Article.

All insulation applications will be considered defective Work if sample inspection reveals noncompliance with requirements.

PIPING INSULATION SCHEDULE, GENERAL

A. Acceptable preformed pipe and tubular insulation materials and thicknesses are identified for each piping system and pipe size range. If more than one material is listed for a piping system, selection from materials listed is Contractor's option.

B. Items Not Insulated: Unless otherwise indicated, do not install insulation on the following:

1. Drainage piping located in crawl spaces.
2. Underground piping.
3. Chrome-plated pipes and fittings unless there is a potential for personnel injury.

INDOOR PIPING INSULATION SCHEDULE

Domestic Hot and Recirculated Hot Water:

1. NPS 1” and Smaller: Insulation shall be the following:

Mineral-Fiber, Preformed Pipe Insulation, Type I: 1” inch thick.

2. NPS 1-1/4” and Larger: Insulation shall be the following:

Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 1/2" inch thick.

Exposed Sanitary Drains, Domestic Water, Domestic Hot Water, and Stops for Plumbing Fixtures for People with Disabilities:

1. All Pipe Sizes: Insulation shall be the following:

McGuire pre-insulated trap and supply covers.

END OF SECTION

SECTION 22 11 16
DOMESTIC WATER PIPING

GENERAL

1.1 SUMMARY

A. Section Includes:

1. Under-building-slab and aboveground domestic water pipes, tubes, and fittings inside buildings.
2. Encasement for piping.

1.2 WORK INCLUDED

A. Furnish all labor, materials, services, testing, transportation and equipment necessary for the completion of all plumbing work as indicated on drawings and specified herein. Work materials and equipment not indicated or specified which is necessary for the complete and proper operation of the work of this Section in accordance with the true intent and meaning of the contract documents shall be provided and incorporated at no additional cost to the Owner.

1.3 QUALITY ASSURANCE

A. Code Requirements: All work covered by this Section shall conform to the latest requirements of the following regulations:

1. C.C.R., Title 24, Part 5 (2025 CPC).
2. 2025 California Plumbing Code.
3. National Fire Protection Association.
4. California Division of the State Architect.
5. California State Division of Industrial Safety.
6. County Health Department.
7. Any other legally constituted body-having jurisdiction thereof.

B. Nothing in the specifications or drawings shall be construed to permit deviation from the requirements of governing codes unless approval for said deviation has been obtained from the legally constituted authorities having jurisdiction and from the Owner's representative.

1.4 DRAWINGS

A. Because of the small-scale drawings, it is not possible to indicate all offsets, fittings and accessories which may be required. The Contractor shall carefully investigate the conditions surrounding installation of his work, furnishing the necessary piping, fittings, valves, traps, and other devices which may be required to complete the installation.

B. The general arrangement indicated on the drawings shall be followed as closely as possible. Coordinate with the Architectural, Structural, Mechanical and Electrical Drawings and the work of other trades prior to installation of piping fixtures and equipment to verify adequate space available for installation of the work shown. In the event a field condition arises which makes it impossible to install the work as indicated, submit, in writing, the proposed departures to the Architect for his approval. Only when Architect's approval is given, in writing, shall Contractor proceed with installation of the work.

C. Special Note: Should the Contractor make changes in the installation differing from what is indicated on the contract drawings and not necessitated due to field conditions as indicated hereinabove, the Contractor shall be required to re-install the work to comply with what has been indicated on the contract drawings. Should it be impossible to re-install the work and the installation is in accordance with all governing authorities, the architect may permit the installation to remain. However, all costs incurred to revise the contract drawings by the engineer for resubmittal to the building department indicating the as-installed condition shall become the responsibility of the Contractor.

D. In case of a difference in the specifications or between the specifications and the drawings, the Contractor shall figure the most expensive alternate and after award of contract, shall secure direction from the Architect.

1.5 PERMITS, INSPECTIONS AND LICENSES

A. All permits, inspections and licenses required by the legally constituted authorities for installation of the work according to the plans and specifications shall be obtained and paid as a part of the work of this section.

1.6 UTILITIES

A. See Drawings for Points of Connection.

B. Certain site utilities are to be connected to and extended. Before laying of any pipe or digging of any trenches, Contractor shall determine by actual excavation and measurement exact location and depth of lines to which he is to connect. In event depth of lines is not sufficient to permit connection in manner indicated, Contractor shall obtain direction from the Owner's representative before proceeding with this work.

C. Verify that utility companies size their services and meters to suit ultimate demand indicated on the drawings.

1.7 EXAMINATION OF PREMISES

A. Before bidding on this work, Contractors shall make a careful examination of the premises and shall thoroughly familiarize themselves with the requirements of the contract. By the act of submitting a proposal for the work included in this contract, the Contractor shall be deemed to have made such study and examination, and that he is familiar with and accepts all conditions of the site.

1.8 PROTECTION

A. All work, equipment and materials shall be protected at all times. Contractor shall make good all damage caused either directly or indirectly by his own workmen. Contractor shall also protect his own work from damage. He shall close all pipe openings with caps or plugs during installation. He shall protect all his equipment and materials against dirt, water, chemical and mechanical injury. Upon completion, all work shall be thoroughly cleaned and delivered in a new condition.

B. Contractor shall be held responsible for all damage to equipment and materials until he has received written notice from the Architect or Engineer that his work has been accepted.

1.9 LOCATIONS

A. The locations of apparatus, piping and equipment indicated on the drawings are approximate. Piping and equipment shall be installed in such a manner as to avoid all obstruction, preserve headroom, and keep openings and passages clear. The locations of and mounting heights of all fixtures shall be coordinated with the architectural plans and room elevations.

B. Clearances and Openings: Contractor shall cooperate and coordinate his work with all other trades to avoid conflict and permit for a neat and orderly appearance of the entire installation. The Contractor shall, in advance of the work, furnish instructions to the General Contractor as to his requirements for equipment and material installation of any kind, whether or not specifically mentioned on drawings or in the specifications, and shall include recesses, chases in walls, and all required openings in the structure. Should furnishing this information be neglected, delayed or incorrect and additional cuttings are found to be required, the cost of the same shall be charged to this Contractor.

C. Contractor shall verify and coordinate pipe routing with location of all electrical rooms, elevator equipment rooms, telecom/data rooms, and other rooms dedicated to the housing of switchgear, panels, or other electrical equipment. In no case shall piping be installed within or above the ceiling of such rooms.

1.10 SUBMITTAL DATA

A. Submittal Requirements:

1. Furnish, all at one time, prior to any installation, within the time noted below, six (6) copies of valid submittal data on all fixtures, material, equipment and devices. Each submitted item shall be indexed and referenced to these specifications and to identification numbers on fixtures and equipment schedules.

2. Manufacturers' submittal literature and shop drawings are required on all items to ensure the latest and most complete manufacturer's data is available for review. Requirements of the submittals and Engineer's submittal notes are a part of the work of this Division except that Engineer's notes may not be used as a means of increasing the scope of work of this Division.

3. Submittals will be checked for general conformance with the design concept of the project but the review does not guarantee quantities shown and does not supersede requirements of this Division to properly install work.

4. To be valid, all submittals must:
    a. Be delivered to the Architect's office within thirty-five (35) days of award of the contract. Contractor shall make time allowance for Engineer's review, return of comments, if any, and resubmittal if required. Corrections or changes in submittals returned as inadequate or incomplete shall be accomplished within this time limit.
    b. Clearly indicate and label as such any items proposed as substitution for that specified or shown on plans.
    c. Include all pertinent construction, installation, performance and technical data.
    d. Have all product data sheets clearly labeled to indicate the individual items being submitted. In addition, all required options and accessories shall be clearly marked.
        1) Product data sheets corresponding to items indicated on plans shall be clearly labeled with the corresponding fixture or equipment tag number.
        2) Product data sheets corresponding to items indicated in specifications shall be clearly labeled with the specification section, page and item numbers.
    e. Include, for every item which differs in size, configuration, connections, service, accessibility or any other significant way, a drawing to the same (or larger) scale as to the pertinent portions of the contract drawings. In this drawing show a complete layout of the system except that which is identical to the contract drawings, unless the unchanged portions must be shown to indicate such things as clearances. This drawing, together with the contract design drawings must show the complete system as revised to accommodate the proposed alternate.

B. Substitution Requirements:
1. Any items included in submittals and proposed by the Contractor as substitution for that specified or shown on plans shall be submitted within thirty five (35) days of award of the contract. After such time, proposed substitutions shall not be accepted for review, and the Contractor shall submit all items as specified or shown on plans.
    a. For each item proposed as substitution for that specified or shown on plans, copies of product data sheets for the specified item shall be placed side by side with product data sheets for the proposed substitution item within the submittal.
        1) In addition to the Submittal Requirements for labeling listed above, product data sheets for the specified item shall be clearly labeled "SPECIFIED ITEM, NOT SUBMITTED". Product data sheets for the corresponding proposed substitution item shall be clearly labeled "PROPOSED SUBSTITUTION".
    b. Provide calculations and other detailed data justifying how any items proposed as substitution were selected for proposal. Data must be complete enough to permit detailed comparison of every significant characteristic for which the specified item was analyzed during design.
2. It shall be the Contractor's responsibility to provide sufficient information to allow the Engineer to analyze any proposed alternate. If inadequate information is provided, the proposal will not be approved and resubmittal will not be allowed.

3. The Contractor shall provide or perform tests required by Engineer for purpose of judging acceptability of proposed substitutions.
4. The Contractor assumes full responsibility that alternate items and procedures will meet the job requirements and is responsible for cost of redesign and of modifications to this and other parts of work caused by alternate items furnished under work in this Section. In view of these responsibilities, it is the purpose of these specifications to establish procedures to ensure that the Contractor has considered all the ramifications of proposed alternates before submitting them for review. Submittals which do not comply with the requirements of these specifications or which indicate proposed alternates that were selected without proper regard to the requirements of the job will not be approved. No more than one proposed alternate will be considered for each item.
5. Alternate items installed without Engineer's approval will be replaced with specified items at Contractor's expense.

1.11 ACTION SUBMITTALS

A. Product Data: For transition fittings and dielectric fittings.

INFORMATIONAL SUBMITTALS

A. System purging and disinfecting activities report.
B. Field quality-control reports.

1.13 FIELD CONDITIONS

Interruption of Existing Water Service: Do not interrupt water service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary water service according to requirements indicated:

1. Notify Architect no fewer than two days in advance of proposed interruption of water service.
2. Do not interrupt water service without Architect's written permission.

PART 2 - PRODUCTS

PIPING MATERIALS

A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and pipe sizes.
B. Potable-water piping and components shall comply with NSF 14 and NSF 61. Plastic piping components shall be marked with "NSF-pw."

2.2 COPPER TUBE AND FITTINGS

Hard Copper Tube: ASTM B 88, Type L water tube, drawn temper.

Soft Copper Tube: ASTM B 88, Type K water tube, annealed temper.

Wrought-Copper, Solder-Joint Fittings: ASME B16.22, wrought-copper pressure fittings.

Bronze Flanges: ASME B16.24, Class 150, with solder-joint ends.

Copper Unions:

1. MSS SP-123.
2. Cast-copper-alloy, hexagonal-stock body.
3. Ball-and-socket, metal-to-metal seating surfaces.
4. Solder-joint or threaded ends.

F. Piping within the building and above grade shall be Type "L" ASTM B88, hard drawn copper tubing with wrought copper sweat fittings ANSI B16.18 and B16.22.

G. Outdoor underground piping in sizes 2-1/2" and 3" shall be Type "L" ASTM B88, hard drawn copper as specified for water piping within the building. Piping 2" and smaller shall be Type "K" ASTM B88, hard drawn copper with wrought copper sweat fittings ANSI B16.18 and B16.22.

H. Piping below the building floor shall be Type "K" soft annealed copper tubing with no fittings below the slab.

PIPING JOINING MATERIALS

A. Pipe-Flange Gasket Materials:

1. AWWA C110/A21.10, rubber, flat face, 1/8 inch thick or ASME B16.21, nonmetallic and asbestos free unless otherwise indicated.
2. Full-face or ring type unless otherwise indicated.

B. Metal, Pipe-Flange Bolts and Nuts: ASME B18.2.1, carbon steel unless otherwise indicated.

C. Solder Filler Metals: ASTM B 32, lead-free alloys.

D. Flux: ASTM B 813, water flushable.

E. Brazing Filler Metals: AWS A5.8/A5.8M, BCP Series, copper-phosphorus alloys for general-duty brazing unless otherwise indicated.

2.4 VALVE ACCESSORIES AND SPECIALTIES

Valve Boxes: Comply with AWWA M44 for cast-iron valve boxes. Include top section, adjustable extension of length required for depth of burial of valve, plug with lettering "WATER," and bottom section with base that fits over valve and with a barrel approximately 5 inches in diameter.

1. For service shut-off valves on domestic water; for pressure regulator assemblies, shall be Brooks Products or Fraser Cement Products Co., rectangular concrete type with vandal-proof cast iron cover and name of service clearly marked on cover. Box shall be of size to permit full range of valve operation and to permit easy removal of valve assembly. Vaults shall be sectional type
2. Operating Wrenches: Steel, tee-handle with one pointed end, stem of length to operate deepest buried valve, and socket matching valve operating nut.

2.5 CORROSION PROTECTION:

1. General.

a. Corrosion protection shall be provided for all below grade copper piping and associated valves and fittings. Such piping shall be protected from corrosion by encasement in a polyethylene protective wrapping, referred to hereafter as polywrap. Although not intended to be a completely air and water tight enclosure, the polywrap shall provide a continuous barrier between the pipe and surrounding bedding and backfill.

2. Materials.

a. Copper piping encasement.

1) The polywrap shall be minimum 6 mil. in thickness, group 2, linear low density, flat tube, natural (clear) virgin polyethylene film formed into tubes or sheets as required. Material shall conform to the requirements of ASTM D1248.

2) The polywrap shall be as manufactured by Northtown Company or approved equal.

b. The minimum Polywrap flat tube width for each pipe diameter shall be as follows:

Pipe Size / Type	Polywrap Flat Tube Width
½" to ¾" copper	2"
1" to 1-½ copper	3"
2" copper	4"
2-1/2" copper	5"
3" copper	6"

c. The polywrap shall be secured as specified with 2 inch wide pressure sensitive plastic tape not less than 10 mils thick.

1) Tape shall be Scotchwrap No. 50, Polyken No. 900, Tapecoat CT, Johns-Manville No. V-10 Trantex or approved equal.

d. Piping through exterior walls shall be sealed using Link Seal modular seal with nitrile seal elements and stainless steel bolts.

EXECUTION

3.1 EARTHWORK

A. Comply with requirements in Section 312000 "Earth Moving" for excavating, trenching, and backfilling.

3.2 PIPING INSTALLATION

Drawing plans, schematics, and diagrams indicate general location and arrangement of domestic water piping. Indicated locations and arrangements are used to size pipe and calculate friction loss, expansion, and other design considerations. Install piping as indicated unless deviations to layout are approved on coordination drawings.

B. Install copper tubing under building slab according to CDA's "Copper Tube Handbook."

C. Install underground copper tube in PE encasement according to ASTM A 674 or AWWA C105/A21.5.

D. Install shutoff valve, strainer, pressure gage, and test tee with valve inside the building at each domestic water-service entrance.

E. Install shutoff valve immediately upstream of each dielectric fitting.

Install domestic water piping level without pitch and plumb.

Install piping concealed from view and protected from physical contact by building occupants unless otherwise indicated and except in equipment rooms and service areas.

H. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

I. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal, and coordinate with other services occupying that space.

J. Install piping to permit valve servicing.

K. Install nipples, unions, special fittings, and valves with pressure ratings the same as or higher than the system pressure rating used in applications below unless otherwise indicated.

L. Install piping free of sags and bends.

M. Install fittings for changes in direction and branch connections.

N. Install unions in copper tubing at final connection to each piece of equipment, machine, and specialty.

O. Install thermometers on outlet piping from each water heater.

P. Install sleeves for piping penetrations of walls, ceilings, and floors.

Q. Install sleeve seals for piping penetrations of concrete walls and slabs.

R. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Section 220518 "Escutcheons for Plumbing Piping."

S. Corrosion Protection:

1. The polyethylene tubing shall be cut into lengths approximately 2 feet longer than the pipe sections. Slip the tube around the pipe, centering it to provide a 1-ft overlap on each adjacent pipe section, and bunching it accordion fashion lengthwise until it clears the pipe ends. Lower the pipe into the trench and make up the pipe joint with the preceding section of pipe. A shallow bell hole must be made at each joint to facilitate installation of the poly-wrap. The bunched-up poly-wrap shall be pulled from the preceding length of pipe, slipped over the end of the new length of pipe, and secured in place with one circumferential turn of tape plus enough overlap to assure firm adhesion. The end of the poly-wrap shall be slipped from the new pipe section over the end of the first wrap until it overlaps the joint at the end of the preceding length of pipe and tape it in place. The loose wrapping on the barrel of the pipe shall be pulled snugly around the barrel of the

pipe and excess material folded over the top of the pipe and the folds held in place by means of short strips of adhesive tape, at about 3 foot intervals along the pipe.

2. Rips, punctures or other damage to the tube shall be repaired with the adhesive tape or pieces of tube material secured with tape. Bends and reducers in the line shall be covered with polyethylene in the same manner as pipe.

3. Valves, tees, crosses and outlets shall be wrapped with flat sheets of the same material. The sheets shall be passed under valves and brought up around the body to the stem. Edges shall be brought together, folded twice and secured with the adhesive tape.

3.3 JOINT CONSTRUCTION

A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

B. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.

C. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:

1. Apply appropriate tape or thread compound to external pipe threads.

2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.

D. Brazed Joints for Copper Tubing: Comply with CDA's "Copper Tube Handbook," "Brazed Joints" chapter.

E. Soldered Joints for Copper Tubing: Apply ASTM B 813, water-flushable flux to end of tube. Join copper tube and fittings according to ASTM B 828 or CDA's "Copper Tube Handbook."

3.4 HANGER AND SUPPORT INSTALLATION

A. Comply with requirements for pipe hanger, support products, and installation in Section 220529 "Hangers and Supports for Plumbing Piping and Equipment."

1. Vertical Piping: MSS Type 8 or 42, clamps.

2. Individual, Straight, Horizontal Piping Runs:

a. 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.

b. Longer Than 100 Feet: MSS Type 43, adjustable roller hangers.

c. Longer Than 100 Feet if Indicated: MSS Type 49, spring cushion rolls.

3. Multiple, Straight, Horizontal Piping Runs 100 Feet or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.

4. Base of Vertical Piping: MSS Type 52, spring hangers.

B. Support vertical piping and tubing at base and at each floor.

C. Rod diameter may be reduced one size for double-rod hangers, to a minimum of 3/8 inch.

D. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:

1. NPS 2 and Smaller: 72 inches with 3/8-inch rod.
2. NPS 2-1/2 to NPS 3: 8 feet with 1/2-inch rod.

E. Install supports for vertical copper tubing every 10 feet.

F. Support piping and tubing not listed in this article according to MSS SP-69 and manufacturer's written instructions.

3.5 CONCRETE VAULT INSTALLATION

A. Install precast concrete vaults according to ASTM C 891.

3.6 CONNECTIONS

Drawings indicate general arrangement of piping, fittings, and specialties.

B. When installing piping adjacent to equipment and machines, allow space for service and maintenance.

C. Connect domestic water piping to exterior water-service piping. Use transition fitting to join dissimilar piping materials.

D. Connect domestic water piping to water-service piping with shutoff valve; extend and connect to the following:

1. Water Heaters: Cold-water inlet and hot-water outlet piping in sizes indicated, but not smaller than sizes of water heater connections.
2. Plumbing Fixtures: Cold- and hot-water-supply piping in sizes indicated, but not smaller than that required by plumbing code.
3. Equipment: Cold- and hot-water-supply piping as indicated, but not smaller than equipment connections. Provide shutoff valve and union for each connection. Use flanges instead of unions for NPS 2-1/2 and larger.

3.7 PIPE AND EQUIPMENT IDENTIFICATION

A. Each operating and service line shut-off valve shall be identified by a 19 ga. brass tag with stamped, engraved type of service identified and area served, complete with hole and brass chain mounted on valve stem or handle. Tag shall be a minimum of one and one-half inch (1-1/2") in diameter.

B. All piping systems shall be readily identifiable by appropriate labeling with the name of the piping contained. Such labeling shall be by means of metal tags, stenciling, stamping, or with adhesive markers, in a manner that is not readily removable. Labeling shall appear on the piping at intervals of not more than 20 ft and at least once in each room and each story traversed by the piping system.

C. Provide on exterior wall of each building opposite the building's main gas service a sign reading "Gas Shut Off". Sign shall be metal with minimum 1-1/2" high-embossed letters.

1. All equipment shall be provided with name plate indicating all pertinent information on it

3.8 FIELD QUALITY CONTROL

Perform the following tests and inspections:

Piping Inspections:

a. Do not enclose, cover, or put piping into operation until it has been inspected and approved by authorities having jurisdiction.

b. During installation, notify authorities having jurisdiction at least one day before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction:

1) Roughing-in Inspection: Arrange for inspection of piping before concealing or closing in after roughing in and before setting fixtures.

2) Final Inspection: Arrange for authorities having jurisdiction to observe tests specified in "Piping Tests" Subparagraph below and to ensure compliance with requirements.

c. Reinspection: If authorities having jurisdiction find that piping will not pass tests or inspections, make required corrections and arrange for reinspection.

d. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.

2. Piping Tests:

a. Fill domestic water piping. Check components to determine that they are not air bound and that piping is full of water.

b. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit a separate report for each test, complete with diagram of portion of piping tested.

c. Leave new, altered, extended, or replaced domestic water piping uncovered and unconcealed until it has been tested and approved. Expose work that was covered or concealed before it was tested.

d. Cap and subject piping to static water pressure of 50 psig above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow it to stand for four hours. Leaks and loss in test pressure constitute defects that must be repaired.

Schedule of Test Pressures:

System Tested	Gauge	Test	Duration
Water	100 PSI	Water	4 Hours

e. Repair leaks and defects with new materials, and retest piping or portion thereof until satisfactory results are obtained.

f. Prepare reports for tests and for corrective action required.

Domestic water piping will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports.

3.9 ADJUSTING

A. Perform the following adjustments before operation:

1. Close drain valves, hydrants, and hose bibbs.
2. Open shutoff valves to fully open position.
3. Open throttling valves to proper setting.
4. Adjust balancing valves in hot-water-circulation return piping to provide adequate flow.
   a. Manually adjust ball-type balancing valves in hot-water-circulation return piping to provide hot-water flow in each branch.
   b. Adjust calibrated balancing valves to flows indicated.
5. Remove plugs used during testing of piping and for temporary sealing of piping during installation.
6. Remove and clean strainer screens. Close drain valves and replace drain plugs.
7. Remove filter cartridges from housings and verify that cartridges are as specified for application where used and are clean and ready for use.
8. Check plumbing specialties and verify proper settings, adjustments, and operation.

3.10 CLEANING

Clean and disinfect potable domestic water piping as follows:

1. Purge new piping and parts of existing piping that have been altered, extended, or repaired before using.
2. Use purging and disinfecting procedures prescribed by authorities having jurisdiction; if methods are not prescribed, use procedures described in either AWWA C651 or AWWA C652 or follow procedures described below:
   a. Flush piping system with clean, potable water until dirty water does not appear at outlets.
   b. Fill and isolate system according to either of the following:
      1) Fill system or part thereof with water/chlorine solution with at least 50 ppm of chlorine. Isolate with valves and allow to stand for 24 hours. Operate all valves during the retention period.
      2) Fill system or part thereof with water/chlorine solution with at least 200 ppm of chlorine. Isolate and allow to stand for three hours. Operate all valves during the retention period.

c. Flush system with clean, potable water until no chlorine is in water coming from system after the standing time.

d. Repeat procedures if biological examination shows contamination.

e. Submit water samples in sterile bottles to authorities having jurisdiction.

Prepare and submit reports of purging and disinfecting activities. Include copies of water-sample approvals from authorities having jurisdiction.

C. Clean interior of domestic water piping system. Remove dirt and debris as work progresses.

3.11 OPERATION INSTRUCTION

A. Prior to occupancy or prior to the date of final inspection, whichever may occur first, the Contractor shall prepare two (2) sets of typewritten instructions for the operation of all equipment, valves, etc., specified and furnished as a part of the work under this section, and shall assign a competent person, thoroughly familiar with the job, to demonstrate and instruct a representative of the Owner in the operation of the equipment. The time of said demonstration and instructions shall be arranged with the Owner's representative approximately one (1) week in advance. Verbal instructions shall include shut-off location of gas and water. The Contractor shall assemble all operation and maintenance data supplied by the manufacturers of the various pieces of equipment, all keys and special wrenches required to operate and service the equipment (including keys for yard boxes, gas stops and fixture stops), and all equipment warranties and deliver same to the representative of the Owner on date of said instructions.

3.12 PIPING SCHEDULE

A. Transition and special fittings with pressure ratings at least equal to piping rating may be used in applications below unless otherwise indicated.

B. Flanges and unions may be used for aboveground piping joints unless otherwise indicated.

Fitting Option: Extruded-tee connections and brazed joints may be used on aboveground copper tubing.

Under-building-slab, domestic water, building-service piping, NPS 3 and smaller, shall be the following:

1. Hard copper tube, ASTM B 88, Type L; wrought-copper, solder-joint fittings; and brazed joints.

Under-building-slab, domestic water piping, NPS 2 and smaller, shall be the following:

1. Soft copper tube, ASTM B 88, Type L; wrought-copper, solder-joint fittings; and brazed joints.

Aboveground domestic water piping shall be the following:

1. Hard copper tube, ASTM B 88, Type L; wrought-copper, solder-joint fittings; and soldered joints.

VALVE SCHEDULE

A. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:

1. Shutoff Duty: Use ball valves for piping NPS 2 and smaller. Use butterfly valves with flanged ends for piping NPS 2-1/2 and larger.

B. Use check valves to maintain correct direction of domestic water flow to and from equipment.

END OF SECTION

SECTION 22 11 19

DOMESTIC WATER PIPING SPECIALTIES

GENERAL

1.1 SUMMARY

A. Section Includes:

1. Vacuum breakers.
2. Hose bibbs.
3. Water-hammer arresters.
4. Trap-seal primer valves.
5. Trap-seal primer systems.

1.2 WORK INCLUDED

A. Furnish all labor, materials, services, testing, transportation and equipment necessary for the completion of all plumbing work as indicated on drawings and specified herein. Work materials and equipment not indicated or specified which is necessary for the complete and proper operation of the work of this Section in accordance with the true intent and meaning of the contract documents shall be provided and incorporated at no additional cost to the Owner.

1.3 QUALITY ASSURANCE

A. Code Requirements: All work covered by this Section shall conform to the latest requirements of the following regulations:

1. C.C.R., Title 24, Part 5 (2025 CPC).
2. 2025 California Plumbing Code.
3. National Fire Protection Association.
4. California Division of the State Architect.
5. California State Division of Industrial Safety.
6. County Health Department.
7. Any other legally constituted body-having jurisdiction thereof.

B. Nothing in the specifications or drawings shall be construed to permit deviation from the requirements of governing codes unless approval for said deviation has been obtained from the legally constituted authorities having jurisdiction and from the Owner's representative.

1.4 PERFORMANCE REQUIREMENTS

A. Components and installation shall be capable of withstanding the following minimum working pressure unless otherwise indicated:

Soil, Waste, and Vent Piping: 10-foot head of water.

Seismic Performance: Soil, waste, and vent piping and support and installation shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

1.5 DRAWINGS

A. Because of the small-scale drawings, it is not possible to indicate all offsets, fittings and accessories which may be required. The Contractor shall carefully investigate the conditions surrounding installation of his work, furnishing the necessary piping, fittings, valves, traps, and other devices which may be required to complete the installation.

B. The general arrangement indicated on the drawings shall be followed as closely as possible. Coordinate with the Architectural, Structural, Mechanical and Electrical Drawings and the work of other trades prior to installation of piping fixtures and equipment to verify adequate space available for installation of the work shown. In the event a field condition arises which makes it impossible to install the work as indicated, submit, in writing, the proposed departures to the Architect for his approval. Only when Architect's approval is given, in writing, shall Contractor proceed with installation of the work.

C. Special Note: Should the Contractor make changes in the installation differing from what is indicated on the contract drawings and not necessitated due to field conditions as indicated hereinabove, the Contractor shall be required to re-install the work to comply with what has been indicated on the contract drawings. Should it be impossible to re-install the work and the installation is in accordance with all governing authorities, the architect may permit the installation to remain. However, all costs incurred to revise the contract drawings by the engineer for resubmittal to the building department indicating the as-installed condition shall become the responsibility of the Contractor.

D. In case of a difference in the specifications or between the specifications and the drawings, the Contractor shall figure the most expensive alternate and after award of contract, shall secure direction from the Architect.

1.6 PERMITS, INSPECTIONS AND LICENSES

A. All permits, inspections and licenses required by the legally constituted authorities for installation of the work according to the plans and specifications shall be obtained and paid as a part of the work of this section.

1.7 UTILITIES

A. See Drawings for Points of Connection.

B. Certain site utilities are to be connected to and extended. Before laying of any pipe or digging of any trenches, Contractor shall determine by actual excavation and measurement exact location

and depth of lines to which he is to connect. In event depth of lines is not sufficient to permit connection in manner indicated, Contractor shall obtain direction from the Owner's representative before proceeding with this work.

C. Verify that utility companies size their services and meters to suit ultimate demand indicated on the drawings.

D. Domestic Water: The Contractor shall be responsible for the domestic water service outside of the building within five feet (5') of the foundation, and within the building itself. See Civil Engineer's plans for onsite domestic water system.

E. Domestic Water Service: The Contractor shall arrange with the serving utility company for the installation of all water meter assemblies and reduced pressure backflow devices, including the service mains and vaults, and all required appurtenances as indicated on the drawings and in accordance with serving utility standards and shall pay all costs incurred. All required capacity fees, frontage fees and inspections, shall be paid for by the Owner. Contractor shall provide necessary tap-in connections in water main for sterilizing of domestic water system. Contractor shall connect into the main water service line as indicated on the drawings. The installation shall be in accordance with the serving utility company's standards.

1.8 EXAMINATION OF PREMISES

A. Before bidding on this work, Contractors shall make a careful examination of the premises and shall thoroughly familiarize themselves with the requirements of the contract. By the act of submitting a proposal for the work included in this contract, the Contractor shall be deemed to have made such study and examination, and that he is familiar with and accepts all conditions of the site.

1.9 PROTECTION

A. All work, equipment and materials shall be protected at all times. Contractor shall make good all damage caused either directly or indirectly by his own workmen. Contractor shall also protect his own work from damage. He shall close all pipe openings with caps or plugs during installation. He shall protect all his equipment and materials against dirt, water, chemical and mechanical injury. Upon completion, all work shall be thoroughly cleaned and delivered in a new condition.

B. Contractor shall be held responsible for all damage to equipment and materials until he has received written notice from the Architect or Engineer that his work has been accepted.

1.10 LOCATIONS

A. The locations of apparatus, piping and equipment indicated on the drawings are approximate. Piping and equipment shall be installed in such a manner as to avoid all obstruction, preserve headroom, and keep openings and passages clear. The locations of and mounting heights of all fixtures shall be coordinated with the architectural plans and room elevations.

B. Clearances and Openings: Contractor shall cooperate and coordinate his work with all other trades to avoid conflict and permit for a neat and orderly appearance of the entire installation. The Contractor shall, in advance of the work, furnish instructions to the General Contractor as

to his requirements for equipment and material installation of any kind, whether or not specifically mentioned on drawings or in the specifications, and shall include recesses, chases in walls, and all required openings in the structure. Should furnishing this information be neglected, delayed or incorrect and additional cuttings are found to be required, the cost of the same shall be charged to this Contractor.

C. Contractor shall verify and coordinate pipe routing with location of all electrical rooms, elevator equipment rooms, telecom/data rooms, and other rooms dedicated to the housing of switchgear, panels, or other electrical equipment. In no case shall piping be installed within or above the ceiling of such rooms.

1.11 SUBMITTAL DATA

A. Submittal Requirements:

1. Furnish, all at one time, prior to any installation, within the time noted below, six (6) copies of valid submittal data on all fixtures, material, equipment and devices. Each submitted item shall be indexed and referenced to these specifications and to identification numbers on fixtures and equipment schedules.
2. Manufacturers' submittal literature and shop drawings are required on all items to ensure the latest and most complete manufacturer's data is available for review. Requirements of the submittals and Engineer's submittal notes are a part of the work of this Division except that Engineer's notes may not be used as a means of increasing the scope of work of this Division.
3. Submittals will be checked for general conformance with the design concept of the project but the review does not guarantee quantities shown and does not supersede requirements of this Division to properly install work.
4. To be valid, all submittals must:
    a. Be delivered to the Architect's office within thirty-five (35) days of award of the contract. Contractor shall make time allowance for Engineer's review, return of comments, if any, and resubmittal if required. Corrections or changes in submittals returned as inadequate or incomplete shall be accomplished within this time limit.
    b. Clearly indicate and label as such any items proposed as substitution for that specified or shown on plans.
    c. Include all pertinent construction, installation, performance and technical data.
    d. Have all product data sheets clearly labeled to indicate the individual items being submitted. In addition, all required options and accessories shall be clearly marked.
        1) Product data sheets corresponding to items indicated on plans shall be clearly labeled with the corresponding fixture or equipment tag number.
        2) Product data sheets corresponding to items indicated in specifications shall be clearly labeled with the specification section, page and item numbers.
    e. Include, for every item which differs in size, configuration, connections, service, accessibility or any other significant way, a drawing to the same (or larger) scale as to the pertinent portions of the contract drawings. In this drawing show a complete

layout of the system except that which is identical to the contract drawings, unless the unchanged portions must be shown to indicate such things as clearances. This drawing, together with the contract design drawings must show the complete system as revised to accommodate the proposed alternate.

B. Substitution Requirements:

1. Any items included in submittals and proposed by the Contractor as substitution for that specified or shown on plans shall be submitted within thirty five (35) days of award of the contract. After such time, proposed substitutions shall not be accepted for review, and the Contractor shall submit all items as specified or shown on plans.

   a. For each item proposed as substitution for that specified or shown on plans, copies of product data sheets for the specified item shall be placed side by side with product data sheets for the proposed substitution item within the submittal.

      1) In addition to the Submittal Requirements for labeling listed above, product data sheets for the specified item shall be clearly labeled “SPECIFIED ITEM, NOT SUBMITTED”. Product data sheets for the corresponding proposed substitution item shall be clearly labeled “PROPOSED SUBSTITUTION”.

   b. Provide calculations and other detailed data justifying how any items proposed as substitution were selected for proposal. Data must be complete enough to permit detailed comparison of every significant characteristic for which the specified item was analyzed during design.

2. It shall be the Contractor’s responsibility to provide sufficient information to allow the Engineer to analyze any proposed alternate. If inadequate information is provided, the proposal will not be approved and resubmittal will not be allowed.

3. The Contractor shall provide or perform tests required by Engineer for purpose of judging acceptability of proposed substitutions.

4. The Contractor assumes full responsibility that alternate items and procedures will meet the job requirements and is responsible for cost of redesign and of modifications to this and other parts of work caused by alternate items furnished under work in this Section. In view of these responsibilities, it is the purpose of these specifications to establish procedures to ensure that the Contractor has considered all the ramifications of proposed alternates before submitting them for review. Submittals which do not comply with the requirements of these specifications or which indicate proposed alternates that were selected without proper regard to the requirements of the job will not be approved. No more than one proposed alternate will be considered for each item.

5. Alternate items installed without Engineer's approval will be replaced with specified items at Contractor's expense.

1.12 UNINSPECTED WORK

A. The Contractor shall not allow or cause any of his work to be covered up or closed in until it has been inspected, tested, approved by all authorities have jurisdiction, and until Project Record drawings have been properly annotated.

B. Should any of his work be covered up or closed in before such inspection, he shall, at his own expense, uncover the work to the satisfaction of the inspection party. All related repair work cost shall be borne by the Contractor.

1.13 RECORD DRAWINGS (Also see General Conditions)

A. Contractor shall provide and keep up-to-date a complete "as-built" record set of blueline prints which shall show every change from the original drawings and the exact "as-built" locations and sizes of the work provided under this Section of the specifications. This set shall include locations, dimensions, depth of buried piping, cleanouts, shut-off valves, sewer invert locations, plugged wyes, tees, etc. On completion of the work, the Contractor shall incorporate all as-built information on a set of reproducible tracings provided by the Architect and this set of reproducibles shall be delivered to the Architect.

1.14 GUARANTEES (Also see General Conditions)

A. Contractor shall guarantee the entire plumbing and piping systems unconditionally for a period of one (1) year after final acceptance. If, during this period, any materials, equipment, or any part of the systems fail to function properly, the Contractor shall make good the defects promptly and without any expense to the Owner.

B. Contractor shall be responsible for all damage to any part of the premises caused by leaks in pipelines or equipment furnished and installed under this Section for a period of one (1) year after date of acceptance of his work.

C. All equipment and fixtures shall carry manufacturer's warranty against defective parts or poor workmanship for not less than one (1) year. See specific equipment specifications for extended warranty requirements.

1.15 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For domestic water piping specialties to include in emergency, operation, and maintenance manuals.

PART 2 - PRODUCTS

GENERAL REQUIREMENTS FOR PIPING SPECIALTIES

Potable-water piping and components shall comply with NSF 61 and NSF 14.

2.2 PERFORMANCE REQUIREMENTS

Minimum Working Pressure for Domestic Water Piping Specialties: 125 psig unless otherwise indicated.

2.3 VACUUM BREAKERS

Pipe-Applied, Atmospheric-Type Vacuum Breakers:

Manufacturers: Subject to compliance with requirements, provide products by the following:

Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

a. Ames Fire & Waterworks; a division of Watts Water Technologies, Inc.

b. Watts; a division of Watts Water Technologies, Inc.; Watts Regulator Company.

c. Zurn Industries, LLC; Plumbing Products Group; Wilkins Water Control Products.

3. Standard: ASSE 1001.
4. Size: NPS 1/4 to NPS 3 (DN 8 to DN 80), as required to match connected piping.
5. Body: Bronze.
6. Inlet and Outlet Connections: Threaded.
7. Finish: Rough bronze.

Hose-Connection Vacuum Breakers:

Manufacturers: Subject to compliance with requirements, provide products by the following:

Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

a. Watts; a division of Watts Water Technologies, Inc.; Watts Regulator Company.

b. Woodford Manufacturing Company; a division of WCM Industries, Inc.

c. Zurn Industries, LLC; Plumbing Products Group; Light Commercial Products.

d. Zurn Industries, LLC; Plumbing Products Group; Wilkins Water Control Products.

3. Standard: ASSE 1011.
4. Body: Bronze, nonremovable, with manual drain.
5. Outlet Connection: Garden-hose threaded complying with ASME B1.20.7.
6. Finish: Rough bronze.

Pressure Vacuum Breakers:

Manufacturers: Subject to compliance with requirements, provide products by the following:

Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

a. Ames Fire & Waterworks; a division of Watts Water Technologies, Inc.

b. Watts; a division of Watts Water Technologies, Inc.; Watts Regulator Company.

c. Zurn Industries, LLC; Plumbing Products Group; Wilkins Water Control Products.

3. Standard: ASSE 1020.
4. Operation: Continuous-pressure applications.
5. Pressure Loss: 5 psig maximum, through middle third of flow range.
6. Size: See plans.
7. Design Flow Rate: See plans.
8. Selected Unit Flow Range Limits: See plans.

9. Accessories:
    a. Valves: Ball type, on inlet and outlet.

Laboratory-Faucet Vacuum Breakers:

Manufacturers: Subject to compliance with requirements, provide products by the following:

Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

    a. Watts; a division of Watts Water Technologies, Inc.; Watts Regulator Company.
    b. Woodford Manufacturing Company; a division of WCM Industries, Inc.
    c. Zurn Industries, LLC; Plumbing Products Group; Wilkins Water Control Products.
3. Standard: ASSE 1035.
4. Size: NPS 1/4 or NPS 3/8 (DN 8 or DN 10) matching faucet size.
5. Body: Bronze.
6. End Connections: Threaded.
7. Finish: Chrome plated.

HOSE BIBBS

Hose Bibbs:

1. Standard: ASME A112.18.1 for sediment faucets.
2. Body Material: Bronze.
3. Seat: Bronze, replaceable.
4. Supply Connections: NPS 3/4 threaded or solder-joint inlet.
5. Outlet Connection: Garden-hose thread complying with ASME B1.20.7.
6. Pressure Rating: 125 psig.
7. Vacuum Breaker: Integral nonremovable, drainable, hose-connection vacuum breaker complying with ASSE 1011.
8. Include operating key with each operating-key hose bibb.

2.5 WATER-HAMMER ARRESTERS

Water-Hammer Arresters:

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Precision Plumbing Products, Inc.

    b. Zurn Industries, LLC; Plumbing Products Group; Specification Drainage Products.
2. Standard: ASSE 1010 or PDI-WH 201.
3. Type: Metal bellows.
4. Size: ASSE 1010, Sizes AA and A through F, or PDI-WH 201, Sizes A through F.

2.6 TRAP-SEAL PRIMER DEVICE

Supply-Type, Trap-Seal Primer Device:

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

MIFAB, Inc.

b. Precision Plumbing Products, Inc.

c. Sioux Chief Manufacturing Company, Inc.

2. Standard: ASSE 1018.
3. Pressure Rating: 125 psig minimum.
4. Body: Bronze.
5. Inlet and Outlet Connections: NPS 1/2 threaded, union, or solder joint.
6. Gravity Drain Outlet Connection: NPS 1/2 threaded or solder joint.
7. Finish: Chrome plated, or rough bronze for units used with pipe or tube that is not chrome finished.

TRAP-SEAL PRIMER SYSTEMS

Trap-Seal Primer Systems:

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Precision Plumbing Products, Inc.

2. Standard: ASSE 1044.
3. Piping: NPS 3/4, ASTM B 88, Type L; copper, water tubing.
4. Cabinet: Surface-mounted steel box with stainless-steel cover.
5. Electric Controls: 24-hour timer, solenoid valve, and manual switch for 120-V ac power.
   a. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
6. Vacuum Breaker: ASSE 1001.
7. Number Outlets: Four.
8. Size Outlets: NPS 1/2.

PART 3 - EXECUTION

3.1 INSTALLATION

Install water-hammer arresters in water piping according to PDI-WH 201.

B. Install supply-type, trap-seal primer valves with outlet piping pitched down toward drain trap a minimum of 1 percent, and connect to floor-drain body, trap, or inlet fitting. Adjust valve for proper flow.

C. Install trap-seal primer systems with outlet piping pitched down toward drain trap a minimum of 1 percent, and connect to floor-drain body, trap, or inlet fitting. Adjust system for proper flow.

3.2 Access Panels:

A. Wall access panels shall be minimum 12" x 12" for concealed valves and other equipment unless otherwise specified or indicated. Ceiling access panels shall be 18" x 18" minimum. Access panels shall be located and positioned for ready access and service of equipment housed within. Where access panels are specified with keyed cylinder locks, all such locks shall be identically keyed.

1. Wall, Non-Fire Rated: Elmdor/Stoneman DW-SS-CL, drywall, stainless steel finish, cylinder lock.
2. Ceiling, Non-fire Rated: Elmdor/Stoneman DW, drywall, prime coated finish, screwdriver latch.
3. Wall, Fire Rated: Elmdor/Stoneman FR-SS-CL, fire rated, stainless steel finish, cylinder lock.
4. Ceiling, Fire rated: Elmdor/Stoneman FRC, Fire rated, prime coated finish, return latch.

3.3 Yard Boxes & Vaults: For service shut-off valves on gas and domestic water; for pressure regulator assemblies and for cleanouts, shall be Brooks Products or Fraser Cement Products Co., rectangular concrete type with vandal-proof cast iron cover and name of service clearly marked on cover. Box shall be of size to permit full range of valve operation and to permit easy removal of valve assembly. Vaults shall be sectional type.

3.4 CONNECTIONS

Comply with requirements for ground equipment in Section 260526 "Grounding and Bonding for Electrical Systems."

B. Fire-retardant-treated-wood blocking is specified in Section 260519 "Low-Voltage Electrical Power Conductors and Cables" for electrical connections.

3.5 LABELING AND IDENTIFYING

A. Equipment Nameplates and Signs: Install engraved plastic-laminate equipment nameplate or sign on or near each of the following:

Supply-type, trap-seal primer valves.

2. Trap-seal primer systems.

B. Distinguish among multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations, in addition to identifying unit.

3.6 FIELD QUALITY CONTROL

Domestic water piping specialties will be considered defective if they do not pass tests and inspections.

B. Prepare test and inspection reports.

3.7 ADJUSTING

A. Set field-adjustable pressure set points of water pressure-reducing valves.

B. Set field-adjustable flow set points of balancing valves.

C. Set field-adjustable temperature set points of temperature-actuated, water mixing valves.

END OF SECTION

SECTION 22 13 16

SANITARY WASTE AND VENT PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Pipe, tube, and fittings.
2. Specialty pipe fittings.
3. Encasement for underground metal piping.

1.2 WORK INCLUDED

A. Furnish all labor, materials, services, testing, transportation and equipment necessary for the completion of all plumbing work as indicated on drawings and specified herein. Work materials and equipment not indicated or specified which is necessary for the complete and proper operation of the work of this Section in accordance with the true intent and meaning of the contract documents shall be provided and incorporated at no additional cost to the Owner.

1.3 QUALITY ASSURANCE

A. Code Requirements: All work covered by this Section shall conform to the latest requirements of the following regulations:

1. C.C.R., Title 24, Part 5 (2025 CPC).
2. 2025 California Plumbing Code.
3. National Fire Protection Association.
4. California Division of the State Architect.
5. California State Division of Industrial Safety.
6. County Health Department.
7. Any other legally constituted body-having jurisdiction thereof.

B. Nothing in the specifications or drawings shall be construed to permit deviation from the requirements of governing codes unless approval for said deviation has been obtained from the legally constituted authorities having jurisdiction and from the Owner's representative.

1.4 PERFORMANCE REQUIREMENTS

A. Components and installation shall be capable of withstanding the following minimum working pressure unless otherwise indicated:

1. Soil, Waste, and Vent Piping: 10-foot head of water.

B. Seismic Performance: Soil, waste, and vent piping and support and installation shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

1.5 DRAWINGS

A. Because of the small-scale drawings, it is not possible to indicate all offsets, fittings and accessories which may be required. The Contractor shall carefully investigate the conditions surrounding installation of his work, furnishing the necessary piping, fittings, valves, traps, and other devices which may be required to complete the installation.

B. The general arrangement indicated on the drawings shall be followed as closely as possible. Coordinate with the Architectural, Structural, Mechanical and Electrical Drawings and the work of other trades prior to installation of piping fixtures and equipment to verify adequate space available for installation of the work shown. In the event a field condition arises which makes it impossible to install the work as indicated, submit, in writing, the proposed departures to the Architect for his approval. Only when Architect's approval is given, in writing, shall Contractor proceed with installation of the work.

C. Special Note: Should the Contractor make changes in the installation differing from what is indicated on the contract drawings and not necessitated due to field conditions as indicated hereinabove, the Contractor shall be required to re-install the work to comply with what has been indicated on the contract drawings. Should it be impossible to re-install the work and the installation is in accordance with all governing authorities, the architect may permit the installation to remain. However, all costs incurred to revise the contract drawings by the engineer for resubmittal to the building department indicating the as-installed condition shall become the responsibility of the Contractor.

D. In case of a difference in the specifications or between the specifications and the drawings, the Contractor shall figure the most expensive alternate and after award of contract, shall secure direction from the Architect.

1.6 PERMITS, INSPECTIONS AND LICENSES

A. All permits, inspections and licenses required by the legally constituted authorities for installation of the work according to the plans and specifications shall be obtained and paid as a part of the work of this section.

1.7 UTILITIES

A. See Drawings for Points of Connection.

B. Certain site utilities are to be connected to and extended. Before laying of any pipe or digging of any trenches, Contractor shall determine by actual excavation and measurement exact location and depth of lines to which he is to connect. In event depth of lines is not sufficient to permit connection in manner indicated, Contractor shall obtain direction from the Owner's representative before proceeding with this work.

C. Verify that utility companies size their services and meters to suit ultimate demand indicated

on the drawings.

1.8 EXAMINATION OF PREMISES

A. Before bidding on this work, Contractors shall make a careful examination of the premises and shall thoroughly familiarize themselves with the requirements of the contract. By the act of submitting a proposal for the work included in this contract, the Contractor shall be deemed to have made such study and examination, and that he is familiar with and accepts all conditions of the site.

1.9 PROTECTION

A. All work, equipment and materials shall be protected at all times. Contractor shall make good all damage caused either directly or indirectly by his own workmen. Contractor shall also protect his own work from damage. He shall close all pipe openings with caps or plugs during installation. He shall protect all his equipment and materials against dirt, water, chemical and mechanical injury. Upon completion, all work shall be thoroughly cleaned and delivered in a new condition.

B. Contractor shall be held responsible for all damage to equipment and materials until he has received written notice from the Architect or Engineer that his work has been accepted.

1.10 LOCATIONS

A. The locations of apparatus, piping and equipment indicated on the drawings are approximate. Piping and equipment shall be installed in such a manner as to avoid all obstruction, preserve headroom, and keep openings and passages clear. The locations of and mounting heights of all fixtures shall be coordinated with the architectural plans and room elevations.

B. Clearances and Openings: Contractor shall cooperate and coordinate his work with all other trades to avoid conflict and permit for a neat and orderly appearance of the entire installation. The Contractor shall, in advance of the work, furnish instructions to the General Contractor as to his requirements for equipment and material installation of any kind, whether or not specifically mentioned on drawings or in the specifications, and shall include recesses, chases in walls, and all required openings in the structure. Should furnishing this information be neglected, delayed or incorrect and additional cuttings are found to be required, the cost of the same shall be charged to this Contractor.

C. Contractor shall verify and coordinate pipe routing with location of all electrical rooms, elevator equipment rooms, telecom/data rooms, and other rooms dedicated to the housing of switchgear, panels, or other electrical equipment. In no case shall piping be installed within or above the ceiling of such rooms.

1.11 SUBMITTAL DATA

A. Submittal Requirements:

1. Furnish, all at one time, prior to any installation, within the time noted below, six (6) copies of valid submittal data on all fixtures, material, equipment and devices. Each

submitted item shall be indexed and referenced to these specifications and to identification numbers on fixtures and equipment schedules.

2. Manufacturers' submittal literature and shop drawings are required on all items to ensure the latest and most complete manufacturer's data is available for review. Requirements of the submittals and Engineer's submittal notes are a part of the work of this Division except that Engineer's notes may not be used as a means of increasing the scope of work of this Division.

3. Submittals will be checked for general conformance with the design concept of the project but the review does not guarantee quantities shown and does not supersede requirements of this Division to properly install work.

4. To be valid, all submittals must:

   a. Be delivered to the Architect's office within thirty-five (35) days of award of the contract. Contractor shall make time allowance for Engineer's review, return of comments, if any, and resubmittal if required. Corrections or changes in submittals returned as inadequate or incomplete shall be accomplished within this time limit.

   b. Clearly indicate and label as such any items proposed as substitution for that specified or shown on plans.

   c. Include all pertinent construction, installation, performance and technical data.

   d. Have all product data sheets clearly labeled to indicate the individual items being submitted. In addition, all required options and accessories shall be clearly marked.

      1) Product data sheets corresponding to items indicated on plans shall be clearly labeled with the corresponding fixture or equipment tag number.

      2) Product data sheets corresponding to items indicated in specifications shall be clearly labeled with the specification section, page and item numbers.

   e. Include, for every item which differs in size, configuration, connections, service, accessibility or any other significant way, a drawing to the same (or larger) scale as to the pertinent portions of the contract drawings. In this drawing show a complete layout of the system except that which is identical to the contract drawings, unless the unchanged portions must be shown to indicate such things as clearances. This drawing, together with the contract design drawings must show the complete system as revised to accommodate the proposed alternate.

B. Substitution Requirements:

   1. Any items included in submittals and proposed by the Contractor as substitution for that specified or shown on plans shall be submitted within thirty five (35) days of award of the contract. After such time, proposed substitutions shall not be accepted for review, and the Contractor shall submit all items as specified or shown on plans.

a. For each item proposed as substitution for that specified or shown on plans, copies of product data sheets for the specified item shall be placed side by side with product data sheets for the proposed substitution item within the submittal.

1) In addition to the Submittal Requirements for labeling listed above, product data sheets for the specified item shall be clearly labeled "SPECIFIED ITEM, NOT SUBMITTED". Product data sheets for the corresponding proposed substitution item shall be clearly labeled "PROPOSED SUBSTITUTION".

b. Provide calculations and other detailed data justifying how any items proposed as substitution were selected for proposal. Data must be complete enough to permit detailed comparison of every significant characteristic for which the specified item was analyzed during design.

2. It shall be the Contractor's responsibility to provide sufficient information to allow the Engineer to analyze any proposed alternate. If inadequate information is provided, the proposal will not be approved and resubmittal will not be allowed.

3. The Contractor shall provide or perform tests required by Engineer for purpose of judging acceptability of proposed substitutions.

4. The Contractor assumes full responsibility that alternate items and procedures will meet the job requirements and is responsible for cost of redesign and of modifications to this and other parts of work caused by alternate items furnished under work in this Section. In view of these responsibilities, it is the purpose of these specifications to establish procedures to ensure that the Contractor has considered all the ramifications of proposed alternates before submitting them for review. Submittals which do not comply with the requirements of these specifications or which indicate proposed alternates that were selected without proper regard to the requirements of the job will not be approved. No more than one proposed alternate will be considered for each item.

5. Alternate items installed without Engineer's approval will be replaced with specified items at Contractor's expense.

1.12 INFORMATIONAL SUBMITTALS

A. Seismic Qualification Certificates: For waste and vent piping, accessories, and components, from manufacturer.

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.

2. Detailed description of piping anchorage devices on which the certification is based and their installation requirements.

B. Field quality-control reports.

1.13 QUALITY ASSURANCE

A. Piping materials shall bear label, stamp, or other markings of specified testing agency.

B. Comply with NSF/ANSI 14, "Plastics Piping Systems Components and Related Materials," for plastic piping components. Include marking with "NSF-dwv" for plastic drain, waste, and vent piping and "NSF-sewer" for plastic sewer piping.

1.14 PROJECT CONDITIONS

A. Interruption of Existing Sanitary Waste Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:

1. Notify Architect no fewer than two days in advance of proposed interruption of sanitary waste service.
2. Do not proceed with interruption of sanitary waste service without Architect's written permission.

1.15 UNINSPECTED WORK

A. The Contractor shall not allow or cause any of his work to be covered up or closed in until it has been inspected, tested, approved by all authorities have jurisdiction, and until Project Record drawings have been properly annotated.

B. Should any of his work be covered up or closed in before such inspection, he shall, at his own expense, uncover the work to the satisfaction of the inspection party. All related repair work cost shall be borne by the Contractor.

1.16 RECORD DRAWINGS (Also see General Conditions)

A. Contractor shall provide and keep up-to-date a complete "as-built" record set of blueline prints which shall show every change from the original drawings and the exact "as-built" locations and sizes of the work provided under this Section of the specifications. This set shall include locations, dimensions, depth of buried piping, cleanouts, shut-off valves, sewer invert locations, plugged wyes, tees, etc. On completion of the work, the Contractor shall incorporate all as-built information on a set of reproducible tracings provided by the Architect and this set of reproducibles shall be delivered to the Architect.

1.17 GUARANTEES (Also see General Conditions)

A. Contractor shall guarantee the entire plumbing and piping systems unconditionally for a period of one (1) year after final acceptance. If, during this period, any materials, equipment, or any part of the systems fail to function properly, the Contractor shall make good the defects promptly and without any expense to the Owner.

B. Contractor shall be responsible for all damage to any part of the premises caused by leaks in pipelines or equipment furnished and installed under this Section for a period of one (1) year after date of acceptance of his work.

C. All equipment and fixtures shall carry manufacturer's warranty against defective parts or poor workmanship for not less than one (1) year. See specific equipment specifications for extended warranty requirements.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and pipe sizes.

2.2 HUBLESS, CAST-IRON SOIL PIPE AND FITTINGS

A. Pipe and Fittings: ASTM A 888 or CISPI 301.

B. ASTM C 1540, Heavy Duty, Hubless-Piping Couplings:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    a. ANACO-Husky SD 4000 series.
    b. MIFAB MI-QXHUB.
2. Description: Stainless-steel corrugated shield with stainless-steel bands and tightening devices; and ASTM C 564, rubber sleeve with integral, center pipe stop.

C. Soil and waste piping within the building itself and outside within five feet (5') of the foundation, shall be no-hub cast iron pipe and fittings, asphaltum coated, free from defects, and shall comply with CISPI. Standard 301, ASTM A-888 or ASTM A-74. Pipe and fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute. Fittings shall be made up with "Husky" SD 4000 series or “MIFAB MI-QXHUB” series stainless steel type 304 couplings and shall conform to ASTM C1540 & ASTM C564 except all above ground vent pipe fittings may be made with "Anaco" or "MIFAB" stainless steel two band couplings conforming to CISPI Standard 310.

D. Except where otherwise indicated on the plans, building sewer piping from five feet (5') outside of the building to connections at the sewer shall be PVC (polyvinyl chloride) ASTM D3034, SDR-35 sewer pipe with locked-in gasket (ASTM F477, Elastomeric Seal.

E. Grease waste piping underground shall be cast iron pipe and fittings as specified for soil and waste piping.

2.3 CLEANOUTS

A. Cast-Iron Cleanouts:

1. Cleanouts to Grade: Jay R. Smith No. 4258 or Jay R. Smith No. 4253 with X-H bronze plug and X-X-H non-skid cover with lifting device set flush with surface for concrete areas. Asphalt or nonsurfaced areas shall be installed with ring of concrete poured around the bottom flange six inches (6") below surface. Use cast iron soil pipe on cleanout risers. For cleanouts in non-traffic areas, terminate cleanout plug in concrete yard box
2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    a. Smith, Jay R. Mfg. Co.

b. Zurn Specification Drainage Operation; Zurn Plumbing Products Group.

3. Description: ASME A112.36.2M, round, gray-iron housing with clamping device and round, secured, scoriated, gray-iron cover. Include gray-iron ferrule with inside calk or spigot connection and countersunk, tapered-thread, brass closure plug.

4. Top-Loading Classification(s): Light Duty Medium Duty Heavy Duty and Extra-Heavy Duty.

5. Sewer Pipe Fitting and Riser to Cleanout: ASTM A 74, Service class, cast-iron soil pipe and fittings.

B. Yard Boxes & Vaults: For service for cleanouts, shall be Brooks Products or Fraser Cement Products Co., rectangular concrete type with vandal-proof cast iron cover and name of service clearly marked on cover. Box shall be of size to permit full range of valve operation and to permit easy removal of valve assembly. Vaults shall be sectional type.

2.4 CORROSION PROTECTION

A. General.

1. Corrosion protection shall be provided for all below grade cast iron and copper piping and associated valves and fittings. Such piping shall be protected from corrosion by encasement in a polyethylene protective wrapping, referred to hereafter as polywrap. Although not intended to be a completely air and water tight enclosure, the polywrap shall provide a continuous barrier between the pipe and surrounding bedding and backfill.

B. Materials.

1. Cast iron piping encasement.

a. The polywrap shall be minimum 8 mil. in thickness, group 2, linear low density, flat tube, natural (clear) virgin polyethylene film formed into tubes or sheets as required. Material shall meet or exceed the requirements of AWWA C105, ANSI A21.5 and ASTM A674.

b. The polywrap shall be as manufactured by Northtown Company or approved equal.

2. The minimum Polywrap flat tube width for each pipe diameter shall be as follows:

Pipe Size / Type	Polywrap Flat Tube Width
2” to 3” cast iron	14”
4” cast iron	16”
6” cast iron	20”

8” cast iron 24”

3. The polywrap shall be secured as specified with 2 inch wide pressure sensitive plastic tape not less than 10 mils thick.

   a. Tape shall be Scotchwrap No. 50, Polyken No. 900, Tapecoat CT, Johns-Manville No. V-10 Trantex or approved equal.

4. Piping through exterior walls shall be sealed using Link Seal modular seal with nitrile seal elements and stainless steel bolts.

PART 3 - EXECUTION

3.1 EARTH MOVING

A. Comply with requirements for excavating, trenching, and backfilling specified in Section 312000 "Earth Moving."

3.2 PIPING INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on coordination drawings.

B. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.

C. The entire system shall be installed and supported in strict accordance with manufacturer's/jurisdiction’s recommendations. Underground piping shall be installed in six inch (6") sand base and six-inch (6") sand cover prior to backfill.

D. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.

F. Install piping to permit valve servicing.

G. Install piping at indicated slopes.

H. Install piping free of sags and bends.

I. Install fittings for changes in direction and branch connections.

J. Install piping to allow application of insulation.

K. Install seismic restraints on piping.

L. Make changes in direction for soil and waste drainage and vent piping using appropriate branches, bends, and long-sweep bends. Sanitary tees and short-sweep 1/4 bends may be used on vertical stacks if change in direction of flow is from horizontal to vertical. Use long-turn, double Y-branch and 1/8-bend fittings if two fixtures are installed back to back or side by side with common drain pipe. Straight tees, elbows, and crosses may be used on vent lines. Do not change direction of flow more than 90 degrees. Use proper size of standard increasers and reducers if pipes of different sizes are connected. Reducing size of drainage piping in direction of flow is prohibited.

M. Lay buried building drainage piping beginning at low point of each system. Install true to grades and alignment indicated, with unbroken continuity of invert. Place hub ends of piping upstream. Install required gaskets according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements. Maintain swab in piping and pull past each joint as completed.

N. Install soil and waste drainage and vent piping at the following minimum slopes unless otherwise indicated:

1. Sanitary Drain: 2 percent downward in direction of flow for piping NPS 3 and smaller; 1 percent downward in direction of flow for piping NPS 4 and larger.
2. Vent Piping: 1 percent down toward vertical fixture vent or toward vent stack.

O. Install cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."

1. Install encasement on underground piping according to ASTM A 674 or AWWA C105/A 21.5.

P. Plumbing Specialties:

1. Install cleanouts at grade and extend to where building sanitary drains connect to building sanitary sewers in sanitary drainage gravity-flow piping. Install cleanout fitting with closure plug inside the building in sanitary drainage force-main piping. Comply with requirements for cleanouts specified in Section 221319 "Sanitary Waste Piping Specialties."
2. Install drains in sanitary drainage gravity-flow piping. Comply with requirements for drains specified in Section 221319 "Sanitary Waste Piping Specialties."

Q. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.

R. Install sleeves for piping penetrations of walls, ceilings, and floors.

S. Install sleeve seals for piping penetrations of concrete walls and slabs.

T. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Section 220518 "Escutcheons for Plumbing Piping."

U. Below-grade piping through exterior walls shall be sealed using Link Seal modular seal with nitrile seal elements and stainless steel bolts and sleeves as manufactured by Century Line.

V. Corrosion Protection:

a. The polyethylene tubing shall be cut into lengths approximately 2 feet longer than the pipe sections. Slip the tube around the pipe, centering it to provide a 1-ft overlap on each adjacent pipe section, and bunching it accordion fashion lengthwise until it clears the pipe ends. Lower the pipe into the trench and make up the pipe joint with the preceding section of pipe. A shallow bell hole must be made at each joint to facilitate installation of the polywrap. The bunched-up polywrap shall be pulled from the preceding length of pipe, slipped over the end of the new length of pipe, and secured in place with one circumferential turn of tape plus enough overlap to assure firm adhesion. The end of the polywrap shall be slipped from the new pipe section over the end of the first wrap until it overlaps the joint at the end of the preceding length of pipe and tape it in place. The loose wrapping on the barrel of the pipe shall be pulled snugly around the barrel of the pipe and excess material folded over the top of the pipe and the folds held in place by means of short strips of adhesive tape, at about 3 foot intervals along the pipe.

b. Rips, punctures or other damage to the tube shall be repaired with the adhesive tape or pieces of tube material secured with tape. Bends and reducers in the line shall be covered with polyethylene in the same manner as pipe.

c. Valves, tees, crosses and outlets shall be wrapped with flat sheets of the same material. The sheets shall be passed under valves and brought up around the body to the stem. Edges shall be brought together, folded twice and secured with the adhesive tape.

3.3 JOINT CONSTRUCTION

A. Join hubless, cast-iron soil piping according to CISPI 310 and CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for hubless-piping coupling joints.

B. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:

1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
2. 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.

3.4 HANGER AND SUPPORT INSTALLATION

A. Comply with requirements for pipe hanger and support devices and installation specified in Section 220529 "Hangers and Supports for Plumbing Piping and Equipment."

1. Install carbon-steel pipe hangers for horizontal piping in noncorrosive environments.
2. Install stainless-steel pipe hangers for horizontal piping in corrosive environments.
3. Install carbon-steel pipe support clamps for vertical piping in noncorrosive environments.

4. Install stainless-steel pipe support clamps for vertical piping in corrosive environments.
5. Vertical Piping: MSS Type 8 or Type 42, clamps.
6. Install individual, straight, horizontal piping runs:
    a. 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
    b. Longer Than 100 Feet: MSS Type 43, adjustable roller hangers.
    c. Longer Than 100 Feet if Indicated: MSS Type 49, spring cushion rolls.
7. Multiple, Straight, Horizontal Piping Runs 100 Feet or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
8. Base of Vertical Piping: MSS Type 52, spring hangers.

B. Support horizontal piping and tubing within 12 inches of each fitting and coupling.

C. Support vertical piping and tubing at base and at each floor.

D. Rod diameter may be reduced one size for double-rod hangers, with 3/8-inch minimum rods.

E. Install hangers for cast-iron soil piping with the following maximum horizontal spacing and minimum rod diameters:
1. NPS 1-1/2 and NPS 2: 60 inches with 3/8-inch rod.
2. NPS 3: 60 inches with 1/2-inch rod.
3. NPS 4 and NPS 5: 60 inches with 5/8-inch rod.
4. Spacing for 10-foot lengths may be increased to 10 feet. Spacing for fittings is limited to 60 inches.

F. Install supports for vertical cast-iron soil piping every 15 feet.

G. Install hangers for steel piping with the following maximum horizontal spacing and minimum rod diameters:
1. NPS 1-1/4: 84 inches with 3/8-inch rod.
2. NPS 1-1/2: 108 inches with 3/8-inch rod.
3. NPS 2: 10 feet with 3/8-inch rod.
4. NPS 2-1/2: 11 feet with 1/2-inch rod.
5. NPS 3: 12 feet with 1/2-inch rod.
6. NPS 4 and NPS 5: 12 feet with 5/8-inch rod.

H. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.

3.5 CLEANOUT INSTALLATION

A. Install cleanouts and riser extensions from sewer pipes to cleanouts at grade. Use cast-iron soil pipe fittings in sewer pipes at branches for cleanouts, and use cast-iron soil pipe for riser extensions to cleanouts. Install piping so cleanouts open in direction of flow in sewer pipe.
1. Use Light-Duty, top-loading classification cleanouts in earth or unpaved foot-traffic areas.

2. Use Medium-Duty, top-loading classification cleanouts in paved foot-traffic areas.
3. Use Heavy-Duty, top-loading classification cleanouts in vehicle-traffic service areas.
4. Use Extra-Heavy-Duty, top-loading classification cleanouts in roads.

B. Set cleanout frames and covers in earth in cast-in-place-concrete block, 18 by 18 by 12 inches deep. Set with tops 1 inch above surrounding grade.

C. Set cleanout frames and covers in concrete pavement and roads with tops flush with pavement surface.

3.6 CONNECTIONS

A. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Connect soil and waste piping to exterior sanitary sewerage piping. Use transition fitting to join dissimilar piping materials.

C. Connect drainage and vent piping to the following:

1. Plumbing Fixtures: Connect drainage piping in sizes indicated, but not smaller than required by plumbing code.
2. Plumbing Fixtures and Equipment: Connect atmospheric vent piping in sizes indicated, but not smaller than required by authorities having jurisdiction.
3. Plumbing Specialties: Connect drainage and vent piping in sizes indicated, but not smaller than required by plumbing code.
4. Install test tees (wall cleanouts) in conductors near floor and floor cleanouts with cover flush with floor.

D. Where installing piping adjacent to equipment, allow space for service and maintenance of equipment.

3.7 IDENTIFICATION

A. Identify exposed sanitary waste and vent piping. Comply with requirements for identification specified in Section 220553 "Identification for Plumbing Piping and Equipment."

3.8 FIELD QUALITY CONTROL

A. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction.

1. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
2. Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.

B. Reinspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for reinspection.

C. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.

D. Test sanitary drainage and vent piping according to procedures of authorities having jurisdiction or, in absence of published procedures, as follows:

1. No piping work shall be concealed or covered until piping has been tested, inspected and approved by the Inspector. All piping for plumbing systems shall be completely installed and tested as required by the California Plumbing Code. Test pressures and times indicated are a minimum only. All tests shall be as required by the governing authority as wellTest for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
2. Leave uncovered and unconcealed new, altered, extended, or replaced drainage and vent piping until it has been tested and approved. Expose work that was covered or concealed before it was tested.
3. Roughing-in Plumbing Test Procedure: Test drainage and vent piping except outside leaders on completion of roughing-in. Close openings in piping system and fill with water to point of overflow, but not less than 10-foot head of water. From 15 minutes before inspection starts to completion of inspection, water level must not drop. Inspect joints for leaks.
4. Finished Plumbing Test Procedure: After plumbing fixtures have been set and traps filled with water, test connections and prove they are gastight and watertight. Plug vent-stack openings on roof and building drains where they leave building. Introduce air into piping system equal to pressure of 1-inch wg. Use U-tube or manometer inserted in trap of water closet to measure this pressure. Air pressure must remain constant without introducing additional air throughout period of inspection. Inspect plumbing fixture connections for gas and water leaks.
5. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
6. Prepare reports for tests and required corrective action.

3.9 CLEANING AND PROTECTION

A. Clean interior of piping. Remove dirt and debris as work progresses.

B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.

C. Place plugs in ends of uncompleted piping at end of day and when work stops.

3.10 PIPING SCHEDULE

A. Flanges and unions may be used on aboveground pressure piping unless otherwise indicated.

B. Aboveground, soil and waste piping shall be the following:

1. Hubless, cast-iron soil pipe and fittings; heavy-duty hubless-piping couplings; and coupled joints.

C. Aboveground, vent piping shall be the following:

1. Hubless, cast-iron soil pipe and fittings; CISPI hubless-piping couplings; and coupled joints.

D. Underground, soil, waste, and vent piping shall be the following:

1. Hubless, cast-iron soil pipe and fittings; heavy-duty hubless-piping couplings; and coupled joints.

END OF SECTION

SECTION 22 13 19

SANITARY WASTE PIPING SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Cleanouts.
2. Floor drains.
3. Miscellaneous sanitary drainage piping specialties.

1.2 DEFINITIONS

A. ABS: Acrylonitrile-butadiene-styrene plastic.

B. FOG: Fats, oils, and greases.

C. HDPE: High-density polyethylene plastic.

1.3 WORK INCLUDED

A. Furnish all labor, materials, services, testing, transportation and equipment necessary for the completion of all plumbing work as indicated on drawings and specified herein. Work materials and equipment not indicated or specified which is necessary for the complete and proper operation of the work of this Section in accordance with the true intent and meaning of the contract documents shall be provided and incorporated at no additional cost to the Owner.

1.4 QUALITY ASSURANCE

A. Code Requirements: All work covered by this Section shall conform to the latest requirements of the following regulations:

1. C.C.R., Title 24, Part 5 (2025 CPC).
2. 2025 California Plumbing Code.
3. National Fire Protection Association.
4. California Division of the State Architect.
5. California State Division of Industrial Safety.
6. County Health Department.
7. Any other legally constituted body-having jurisdiction thereof.

B. Nothing in the specifications or drawings shall be construed to permit deviation from the requirements of governing codes unless approval for said deviation has been obtained from the legally constituted authorities having jurisdiction and from the Owner's representative.

1.5 PERFORMANCE REQUIREMENTS

A. Components and installation shall be capable of withstanding the following minimum working pressure unless otherwise indicated:

1. Soil, Waste, and Vent Piping: 10-foot head of water.

B. Seismic Performance: Soil, waste, and vent piping and support and installation shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

1.6 DRAWINGS

A. Because of the small-scale drawings, it is not possible to indicate all offsets, fittings and accessories which may be required. The Contractor shall carefully investigate the conditions surrounding installation of his work, furnishing the necessary piping, fittings, valves, traps, and other devices which may be required to complete the installation.

B. The general arrangement indicated on the drawings shall be followed as closely as possible. Coordinate with the Architectural, Structural, Mechanical and Electrical Drawings and the work of other trades prior to installation of piping fixtures and equipment to verify adequate space available for installation of the work shown. In the event a field condition arises which makes it impossible to install the work as indicated, submit, in writing, the proposed departures to the Architect for his approval. Only when Architect's approval is given, in writing, shall Contractor proceed with installation of the work.

C. Special Note: Should the Contractor make changes in the installation differing from what is indicated on the contract drawings and not necessitated due to field conditions as indicated hereinabove, the Contractor shall be required to re-install the work to comply with what has been indicated on the contract drawings. Should it be impossible to re-install the work and the installation is in accordance with all governing authorities, the architect may permit the installation to remain. However, all costs incurred to revise the contract drawings by the engineer for resubmittal to the building department indicating the as-installed condition shall become the responsibility of the Contractor.

D. In case of a difference in the specifications or between the specifications and the drawings, the Contractor shall figure the most expensive alternate and after award of contract, shall secure direction from the Architect.

1.7 PERMITS, INSPECTIONS AND LICENSES

A. All permits, inspections and licenses required by the legally constituted authorities for installation of the work according to the plans and specifications shall be obtained and paid as a part of the work of this section.

1.8 EXAMINATION OF PREMISES

A. Before bidding on this work, Contractors shall make a careful examination of the premises and shall thoroughly familiarize themselves with the requirements of the contract. By the act of submitting a proposal for the work included in this contract, the Contractor shall be deemed to have made such study and examination, and that he is familiar with and accepts all conditions of the site.

1.9 PROTECTION

A. All work, equipment and materials shall be protected at all times. Contractor shall make good all damage caused either directly or indirectly by his own workmen. Contractor shall also protect his own work from damage. He shall close all pipe openings with caps or plugs during installation. He shall protect all his equipment and materials against dirt, water, chemical and mechanical injury. Upon completion, all work shall be thoroughly cleaned and delivered in a new condition.

B. Contractor shall be held responsible for all damage to equipment and materials until he has received written notice from the Architect or Engineer that his work has been accepted.

1.10 LOCATIONS

A. The locations of apparatus, piping and equipment indicated on the drawings are approximate. Piping and equipment shall be installed in such a manner as to avoid all obstruction, preserve headroom, and keep openings and passages clear. The locations of and mounting heights of all fixtures shall be coordinated with the architectural plans and room elevations.

B. Clearances and Openings: Contractor shall cooperate and coordinate his work with all other trades to avoid conflict and permit for a neat and orderly appearance of the entire installation. The Contractor shall, in advance of the work, furnish instructions to the General Contractor as to his requirements for equipment and material installation of any kind, whether or not specifically mentioned on drawings or in the specifications, and shall include recesses, chases in walls, and all required openings in the structure. Should furnishing this information be neglected, delayed or incorrect and additional cuttings are found to be required, the cost of the same shall be charged to this Contractor.

C. Contractor shall verify and coordinate pipe routing with location of all electrical rooms, elevator equipment rooms, telecom/data rooms, and other rooms dedicated to the housing of switchgear, panels, or other electrical equipment. In no case shall piping be installed within or above the ceiling of such rooms.

1.11 SUBMITTAL DATA

A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, and accessories for the following:

1. Grease interceptors.

B. Submittal Requirements:

1. Furnish, all at one time, prior to any installation, within the time noted below, six (6) copies of valid submittal data on all fixtures, material, equipment and devices. Each submitted item shall be indexed and referenced to these specifications and to identification numbers on fixtures and equipment schedules.
2. Manufacturers' submittal literature and shop drawings are required on all items to ensure the latest and most complete manufacturer's data is available for review. Requirements of the submittals and Engineer's submittal notes are a part of the work of this Division except that Engineer's notes may not be used as a means of increasing the scope of work of this Division.
3. Submittals will be checked for general conformance with the design concept of the project but the review does not guarantee quantities shown and does not supersede requirements of this Division to properly install work.
4. To be valid, all submittals must:
    a. Be delivered to the Architect's office within thirty-five (35) days of award of the contract. Contractor shall make time allowance for Engineer's review, return of comments, if any, and resubmittal if required. Corrections or changes in submittals returned as inadequate or incomplete shall be accomplished within this time limit.
    b. Clearly indicate and label as such any items proposed as substitution for that specified or shown on plans.
    c. Include all pertinent construction, installation, performance and technical data.
    d. Have all product data sheets clearly labeled to indicate the individual items being submitted. In addition, all required options and accessories shall be clearly marked.
        1) Product data sheets corresponding to items indicated on plans shall be clearly labeled with the corresponding fixture or equipment tag number.
        2) Product data sheets corresponding to items indicated in specifications shall be clearly labeled with the specification section, page and item numbers.
    e. Include, for every item which differs in size, configuration, connections, service, accessibility or any other significant way, a drawing to the same (or larger) scale as to the pertinent portions of the contract drawings. In this drawing show a complete layout of the system except that which is identical to the contract drawings, unless the unchanged portions must be shown to indicate such things as clearances. This drawing, together with the contract design drawings must show the complete system as revised to accommodate the proposed alternate.

C. Substitution Requirements:

1. Any items included in submittals and proposed by the Contractor as substitution for that specified or shown on plans shall be submitted within thirty five (35) days of award of the contract. After such time, proposed substitutions shall not be accepted for review, and the Contractor shall submit all items as specified or shown on plans.

a. For each item proposed as substitution for that specified or shown on plans, copies of product data sheets for the specified item shall be placed side by side with product data sheets for the proposed substitution item within the submittal.

1) In addition to the Submittal Requirements for labeling listed above, product data sheets for the specified item shall be clearly labeled “SPECIFIED ITEM, NOT SUBMITTED”. Product data sheets for the corresponding proposed substitution item shall be clearly labeled “PROPOSED SUBSTITUTION”.

b. Provide calculations and other detailed data justifying how any items proposed as substitution were selected for proposal. Data must be complete enough to permit detailed comparison of every significant characteristic for which the specified item was analyzed during design.

2. It shall be the Contractor’s responsibility to provide sufficient information to allow the Engineer to analyze any proposed alternate. If inadequate information is provided, the proposal will not be approved and resubmittal will not be allowed.

3. The Contractor shall provide or perform tests required by Engineer for purpose of judging acceptability of proposed substitutions.

4. The Contractor assumes full responsibility that alternate items and procedures will meet the job requirements and is responsible for cost of redesign and of modifications to this and other parts of work caused by alternate items furnished under work in this Section. In view of these responsibilities, it is the purpose of these specifications to establish procedures to ensure that the Contractor has considered all the ramifications of proposed alternates before submitting them for review. Submittals which do not comply with the requirements of these specifications or which indicate proposed alternates that were selected without proper regard to the requirements of the job will not be approved. No more than one proposed alternate will be considered for each item.

5. Alternate items installed without Engineer's approval will be replaced with specified items at Contractor's expense.

1.12 INFORMATIONAL SUBMITTALS

A. Manufacturer Seismic Qualification Certification: Submit certification that grease interceptors**,** accessories, and components will withstand seismic forces defined in Section 220548 "Vibration and Seismic Controls for Plumbing Piping and Equipment." Include the following:

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.

a. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified."

b. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."

2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.

3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

B. Field quality-control reports.

1.13 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For drainage piping specialties to include in emergency, operation, and maintenance manuals.

1.14 QUALITY ASSURANCE

A. Drainage piping specialties shall bear label, stamp, or other markings of specified testing agency.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

C. Comply with NSF 14, "Plastics Piping Components and Related Materials," for plastic sanitary piping specialty components.

1.15 UNINSPECTED WORK

A. The Contractor shall not allow or cause any of his work to be covered up or closed in until it has been inspected, tested, approved by all authorities have jurisdiction, and until Project Record drawings have been properly annotated.

B. Should any of his work be covered up or closed in before such inspection, he shall, at his own expense, uncover the work to the satisfaction of the inspection party. All related repair work cost shall be borne by the Contractor.

1.16 RECORD DRAWINGS (Also see General Conditions)

A. Contractor shall provide and keep up-to-date a complete "as-built" record set of blueline prints which shall show every change from the original drawings and the exact "as-built" locations and sizes of the work provided under this Section of the specifications. This set shall include locations, dimensions, depth of buried piping, cleanouts, shut-off valves, sewer invert locations, plugged wyes, tees, etc. On completion of the work, the Contractor shall incorporate all as-built information on a set of reproducible tracings provided by the Architect and this set of reproducibles shall be delivered to the Architect.

1.17 GUARANTEES

A. Contractor shall guarantee the entire plumbing and piping systems unconditionally for a period of one (1) year after final acceptance. If, during this period, any materials, equipment, or any part of the systems fail to function properly, the Contractor shall make good the defects promptly and without any expense to the Owner.

B. Contractor shall be responsible for all damage to any part of the premises caused by leaks in pipelines or equipment furnished and installed under this Section for a period of one (1) year after date of acceptance of his work.

C. All equipment and fixtures shall carry manufacturer's warranty against defective parts or poor workmanship for not less than one (1) year. See specific equipment specifications for extended warranty requirements.

1.18 COORDINATION

A. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Section 033000 "Cast-in-Place Concrete."

B. Coordinate size and location of roof penetrations.

1.19 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Cultures: Provide 1-gal. bottles of bacteria culture recommended by manufacturer of FOG disposal systems equal to 200 percent of amount installed, but no fewer than 2 1-gal. bottles.

PART 2 - PRODUCTS

2.1 CLEANOUTS

A. Exposed Metal Cleanouts:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Zurn
   b. JR Smith
   c. Watts

2. Standard: ASME A112.36.2M for cast iron for cleanout test tee.
3. Size: Same as connected drainage piping
4. Body Material: Hubless, cast-iron soil pipe test tee as required to match connected piping.
5. Closure: Countersunk, brass plug.
6. Closure Plug Size: Same as or not more than one size smaller than cleanout size.

B. Metal Floor Cleanouts:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    a. Zurn
    b. JR Smith
    c. Watts

2. Standard: ASME A112.36.2M for cast-iron soil pipe with cast-iron ferrule threaded, adjustable housing cleanout.
3. Size: Same as connected branch.
4. Type: Cast-iron soil pipe with cast-iron ferrule Threaded, adjustable housing.
5. Body or Ferrule: Cast iron.
6. Outlet Connection: Threaded.
7. Closure: Brass plug with tapered threads.
8. Adjustable Housing Material: Cast iron with set-screws or other device.
9. Frame and Cover Material and Finish: Nickel-bronze, copper alloy.
10. Frame and Cover Shape: Round.
11. Top Loading Classification: Heavy Duty.
12. Riser: ASTM A 74, Service class, cast-iron drainage pipe fitting and riser to cleanout.

C. Cast-Iron Wall Cleanouts:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    a. Zurn
    b. JR Smith
    c. Watts

2. Standard: ASME A112.36.2M. Include wall access.
3. Size: Same as connected drainage piping.
4. Body: Hubless, cast-iron soil pipe test tee as required to match connected piping.
5. Option for drilled-and-threaded plug in first subparagraph below is for a screw for a wall cover plate.
6. Closure: Countersunk, brass plug.
7. Closure Plug Size: Same as or not more than one size smaller than cleanout size.
8. Wall Access: Round, flat, chrome-plated brass or stainless-steel cover plate with screw.
9. Wall Access: stainless-steel wall-installation frame and cover.

2.2 FLOOR DRAINS

A. Cast-Iron Floor Drains:

1. Manufacturers: Subject to compliance with requirements, provide products by one of 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. Zurn
    b. JR Smith
    c. Watts
3. Standard: ASME A112.6.3.
4. Pattern: Floor drain.
5. Body Material: Gray iron.
6. Seepage Flange: Required.
7. Anchor Flange: Required.
8. Clamping Device: Required.
9. Outlet: Bottom.
10. Coating in first subparagraph below is usually used only on sanitary floor drains.
11. Coating on Interior and Exposed Exterior Surfaces: Acid-resistant enamel.
12. Sediment Bucket: Not required.
13. Top or Strainer Material: Nickel bronze.
14. Top of Body and Strainer Finish: Nickel bronze.
15. Top Shape: Round.

B. Stainless-Steel Floor Drains:

1. Manufacturers: Subject to compliance with requirements, provide products by 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. Josam Company.
3. Standard: ASME A112.3.1.
4. Outlet: Bottom.
5. Top or Strainer Material: Stainless steel.
6. Top Shape: Round.
7. Trap-Primer Connection: Required.

2.3 MISCELLANEOUS SANITARY DRAINAGE PIPING SPECIALTIES

A. Vent Caps:

1. Description: Cast-iron body with threaded or hub inlet and vandal-proof design. Include vented hood and setscrews to secure to vent pipe.
2. Size: Same as connected stack vent or vent stack.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install cleanouts in aboveground piping and building drain piping according to the following, unless otherwise indicated:

1. Size same as drainage piping up to NPS 4. Use NPS 4 for larger drainage piping unless larger cleanout is indicated.
2. Locate at each change in direction of piping greater than 45 degrees.
3. Locate at minimum intervals of 50 feet for piping NPS 4 and smaller and 100 feet for larger piping.
4. Locate at base of each vertical soil and waste stack.

B. For floor cleanouts for piping below floors, install cleanout deck plates with top flush with finished floor.

C. For cleanouts located in concealed piping, install cleanout wall access covers, of types indicated, with frame and cover flush with finished wall.

D. Install floor drains at low points of surface areas to be drained. Set grates of drains flush with finished floor, unless otherwise indicated.

1. Install floor-drain flashing collar or flange so no leakage occurs between drain and adjoining flooring. Maintain integrity of waterproof membranes where penetrated.
2. Install individual traps for floor drains connected to sanitary building drain, unless otherwise indicated.

E. Install roof flashing assemblies on sanitary stack vents and vent stacks that extend through roof.

F. Install flashing fittings on sanitary stack vents and vent stacks that extend through roof.

G. Install through-penetration firestop assemblies in plastic conductors and stacks at floor penetrations.

H. Install floor-drain, trap-seal primer fittings on inlet to floor drains that require trap-seal primer connection.

1. Exception: Fitting may be omitted if trap has trap-seal primer connection.
2. Size: Same as floor drain inlet.

I. Install air-gap fittings on draining-type backflow preventers and on indirect-waste piping discharge into sanitary drainage system.

J. Install sleeve flashing device with each riser and stack passing through floors with waterproof membrane.

K. Install vent caps on each vent pipe passing through roof.

L. Install frost-resistant vent terminals on each vent pipe passing through roof. Maintain 1-inch clearance between vent pipe and roof substrate.

M. Install expansion joints on vertical stacks and conductors. Position expansion joints for easy access and maintenance.

N. Install frost-proof vent caps on each vent pipe passing through roof. Maintain 1-inch clearance between vent pipe and roof substrate.

O. Install wood-blocking reinforcement for wall-mounting-type specialties.

P. Install traps on plumbing specialty drain outlets. Omit traps on indirect wastes unless trap is indicated.

3.2 CONNECTIONS

A. Comply with requirements in Section 22 13 16 "Sanitary Waste and Vent Piping" for piping installation requirements. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Install piping adjacent to equipment to allow service and maintenance.

C. Ground equipment according to Section 26 05 26 "Grounding and Bonding for Electrical Systems."

D. Connect wiring according to Section 26 05 19 "Low-Voltage Electrical Power Conductors and Cables."

3.3 FLASHING INSTALLATION

A. Fabricate flashing from single piece unless large pans, sumps, or other drainage shapes are required. Join flashing according to the following if required:

1. Lead Sheets: Burn joints of lead sheets 6.0-lb/sq. ft., 0.0938-inch thickness or thicker. Solder joints of lead sheets 4.0-lb/sq. ft., 0.0625-inch thickness or thinner.

2. Copper Sheets: Solder joints of copper sheets.

B. Install sheet flashing on pipes, sleeves, and specialties passing through or embedded in floors and roofs with waterproof membrane.

1. Pipe Flashing: Sleeve type, matching pipe size, with minimum length of 10 inches, and skirt or flange extending at least 8 inches around pipe.

2. Sleeve Flashing: Flat sheet, with skirt or flange extending at least 8 inches around sleeve.

3. Embedded Specialty Flashing: Flat sheet, with skirt or flange extending at least 8 inches around specialty.

C. Set flashing on floors and roofs in solid coating of bituminous cement.

D. Secure flashing into sleeve and specialty clamping ring or device.

E. Install flashing for piping passing through roofs with counterflashing or commercially made flashing fittings, according to Section 07 62 00 "Sheet Metal Flashing and Trim."

F. Extend flashing up vent pipe passing through roofs and turn down into pipe, or secure flashing into cast-iron sleeve having calking recess.

G. Fabricate and install flashing and pans, sumps, and other drainage shapes.

3.4 LABELING AND IDENTIFYING

A. Equipment Nameplates and Signs: Install engraved plastic-laminate equipment nameplate or sign on or near each of the following:

1. Grease interceptors.

B. Distinguish among multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations, in addition to identifying unit. Nameplates and signs are specified in Section 22 05 53 "Identification for Plumbing Piping and Equipment."

3.5 FIELD QUALITY CONTROL

A. Perform tests and inspections and prepare test reports.

B. Tests and Inspections:

1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.

2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.6 PROTECTION

A. Protect drains during remainder of construction period to avoid clogging with dirt or debris and to prevent damage from traffic or construction work.

B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

3.7 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain grease removal devices. Refer to Section 01 79 00 "Demonstration and Training."

END OF SECTION

SECTION 22 33 00

ELECTRIC DOMESTIC-WATER HEATERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Commercial, electric, storage, domestic-water heaters.
2. Domestic-water heater accessories.

1.2 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Commercial domestic-water heaters shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified."

1.3 WORK INCLUDED

A. Furnish all labor, materials, services, testing, transportation and equipment necessary for the completion of all plumbing work as indicated on drawings and specified herein. Work materials and equipment not indicated or specified which is necessary for the complete and proper operation of the work of this Section in accordance with the true intent and meaning of the contract documents shall be provided and incorporated at no additional cost to the Owner.

1.4 QUALITY ASSURANCE

A. Code Requirements: All work covered by this Section shall conform to the latest requirements of the following regulations:

1. C.C.R., Title 24, Part 5 (2025 CPC).
2. 2025 California Plumbing Code.
3. National Fire Protection Association.
4. California Division of the State Architect.
5. California State Division of Industrial Safety.
6. County Health Department.
7. Any other legally constituted body-having jurisdiction thereof.

B. Nothing in the specifications or drawings shall be construed to permit deviation from the requirements of governing codes unless approval for said deviation has been obtained from the legally constituted authorities having jurisdiction and from the Owner's representative.

1.5 DRAWINGS

A. Because of the small-scale drawings, it is not possible to indicate all offsets, fittings and accessories which may be required. The Contractor shall carefully investigate the conditions surrounding installation of his work, furnishing the necessary piping, fittings, valves, traps, and other devices which may be required to complete the installation.

B. The general arrangement indicated on the drawings shall be followed as closely as possible. Coordinate with the Architectural, Structural, Mechanical and Electrical Drawings and the work of other trades prior to installation of piping fixtures and equipment to verify adequate space available for installation of the work shown. In the event a field condition arises which makes it impossible to install the work as indicated, submit, in writing, the proposed departures to the Architect for his approval. Only when Architect's approval is given, in writing, shall Contractor proceed with installation of the work.

C. Special Note: Should the Contractor make changes in the installation differing from what is indicated on the contract drawings and not necessitated due to field conditions as indicated hereinabove, the Contractor shall be required to re-install the work to comply with what has been indicated on the contract drawings. Should it be impossible to re-install the work and the installation is in accordance with all governing authorities, the architect may permit the installation to remain. However, all costs incurred to revise the contract drawings by the engineer for resubmittal to the building department indicating the as-installed condition shall become the responsibility of the Contractor.

D. In case of a difference in the specifications or between the specifications and the drawings, the Contractor shall figure the most expensive alternate and after award of contract, shall secure direction from the Architect.

1.6 PERMITS, INSPECTIONS AND LICENSES

A. All permits, inspections and licenses required by the legally constituted authorities for installation of the work according to the plans and specifications shall be obtained and paid as a part of the work of this section.

1.7 EXAMINATION OF PREMISES

A. Before bidding on this work, Contractors shall make a careful examination of the premises and shall thoroughly familiarize themselves with the requirements of the contract. By the act of submitting a proposal for the work included in this contract, the Contractor shall be deemed to have made such study and examination, and that he is familiar with and accepts all conditions of the site.

1.8 PROTECTION

A. All work, equipment and materials shall be protected at all times. Contractor shall make good all damage caused either directly or indirectly by his own workmen. Contractor shall also protect his own work from damage. He shall close all pipe openings with caps or plugs during installation. He shall protect all his equipment and materials against dirt, water, chemical and mechanical injury. Upon completion, all work shall be thoroughly cleaned and delivered in a new condition.

B. Contractor shall be held responsible for all damage to equipment and materials until he has received written notice from the Architect or Engineer that his work has been accepted.

1.9 LOCATIONS

A. The locations of apparatus, piping and equipment indicated on the drawings are approximate. Piping and equipment shall be installed in such a manner as to avoid all obstruction, preserve headroom, and keep openings and passages clear. The locations of and mounting heights of all fixtures shall be coordinated with the architectural plans and room elevations.

B. Clearances and Openings: Contractor shall cooperate and coordinate his work with all other trades to avoid conflict and permit for a neat and orderly appearance of the entire installation. The Contractor shall, in advance of the work, furnish instructions to the General Contractor as to his requirements for equipment and material installation of any kind, whether or not specifically mentioned on drawings or in the specifications, and shall include recesses, chases in walls, and all required openings in the structure. Should furnishing this information be neglected, delayed or incorrect and additional cuttings are found to be required, the cost of the same shall be charged to this Contractor.

C. Contractor shall verify and coordinate pipe routing with location of all electrical rooms, elevator equipment rooms, telecom/data rooms, and other rooms dedicated to the housing of switchgear, panels, or other electrical equipment. In no case shall piping be installed within or above the ceiling of such rooms.

1.10 SUBMITTAL DATA

A. Submittal Requirements:

1. Furnish, all at one time, prior to any installation, within the time noted below, six (6) copies of valid submittal data on all fixtures, material, equipment and devices. Each submitted item shall be indexed and referenced to these specifications and to identification numbers on fixtures and equipment schedules.

2. Manufacturers' submittal literature and shop drawings are required on all items to ensure the latest and most complete manufacturer's data is available for review. Requirements of the submittals and Engineer's submittal notes are a part of the work of this Division except that Engineer's notes may not be used as a means of increasing the scope of work of this Division.

3. Submittals will be checked for general conformance with the design concept of the project but the review does not guarantee quantities shown and does not supersede requirements of this Division to properly install work.

4. To be valid, all submittals must:

   a. Be delivered to the Architect's office within thirty-five (35) days of award of the contract. Contractor shall make time allowance for Engineer's review, return of comments, if any, and resubmittal if required. Corrections or changes in submittals returned as inadequate or incomplete shall be accomplished within this time limit.

b. Clearly indicate and label as such any items proposed as substitution for that specified or shown on plans.

c. Include all pertinent construction, installation, performance and technical data.

d. Have all product data sheets clearly labeled to indicate the individual items being submitted. In addition, all required options and accessories shall be clearly marked.

1) Product data sheets corresponding to items indicated on plans shall be clearly labeled with the corresponding fixture or equipment tag number.

2) Product data sheets corresponding to items indicated in specifications shall be clearly labeled with the specification section, page and item numbers.

e. Include, for every item which differs in size, configuration, connections, service, accessibility or any other significant way, a drawing to the same (or larger) scale as to the pertinent portions of the contract drawings. In this drawing show a complete layout of the system except that which is identical to the contract drawings, unless the unchanged portions must be shown to indicate such things as clearances. This drawing, together with the contract design drawings must show the complete system as revised to accommodate the proposed alternate.

B. Substitution Requirements:

1. Any items included in submittals and proposed by the Contractor as substitution for that specified or shown on plans shall be submitted within thirty five (35) days of award of the contract. After such time, proposed substitutions shall not be accepted for review, and the Contractor shall submit all items as specified or shown on plans.

a. For each item proposed as substitution for that specified or shown on plans, copies of product data sheets for the specified item shall be placed side by side with product data sheets for the proposed substitution item within the submittal.

1) In addition to the Submittal Requirements for labeling listed above, product data sheets for the specified item shall be clearly labeled “SPECIFIED ITEM, NOT SUBMITTED”. Product data sheets for the corresponding proposed substitution item shall be clearly labeled “PROPOSED SUBSTITUTION”.

b. Provide calculations and other detailed data justifying how any items proposed as substitution were selected for proposal. Data must be complete enough to permit detailed comparison of every significant characteristic for which the specified item was analyzed during design.

2. It shall be the Contractor’s responsibility to provide sufficient information to allow the Engineer to analyze any proposed alternate. If inadequate information is provided, the proposal will not be approved and resubmittal will not be allowed.

3. The Contractor shall provide or perform tests required by Engineer for purpose of judging acceptability of proposed substitutions.

4. The Contractor assumes full responsibility that alternate items and procedures will meet the job requirements and is responsible for cost of redesign and of modifications to this and other parts of work caused by alternate items furnished under work in this Section. In view of these responsibilities, it is the purpose of these specifications to establish procedures to ensure that the Contractor has considered all the ramifications of proposed alternates before submitting them for review. Submittals which do not comply with the requirements of these specifications or which indicate proposed alternates that were selected without proper regard to the requirements of the job will not be approved. No more than one proposed alternate will be considered for each item.
5. Alternate items installed without Engineer's approval will be replaced with specified items at Contractor's expense.
6. The Architect or his authorized representative shall be the sole judge as to the quality and suitability of proposed alternate equipment, fixtures or materials. Decisions of the Architect or that of his representative shall be final and conclusive.

1.11 UNINSPECTED WORK

A. The Contractor shall not allow or cause any of his work to be covered up or closed in until it has been inspected, tested, approved by all authorities have jurisdiction, and until Project Record drawings have been properly annotated.

1.12 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. ASHRAE/IESNA Compliance: Fabricate and label fuel-fired, domestic-water heaters to comply with ASHRAE/IESNA 90.1.

C. ASME Compliance:

1. Where ASME-code construction is indicated, fabricate and label commercial, domestic-water heater storage tanks to comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.

D. NSF Compliance: Fabricate and label equipment components that will be in contact with potable water to comply with NSF 61, "Drinking Water System Components - Health Effects."

1.13 COORDINATION

A. Coordinate sizes and locations of concrete bases with actual equipment provided.

1.14 RECORD DRAWINGS (Also see General Conditions)

A. Contractor shall provide and keep up-to-date a complete "as-built" record set of blueline prints which shall show every change from the original drawings and the exact "as-built" locations and sizes of the work provided under this Section of the specifications. This set shall include locations, dimensions, depth of buried piping, cleanouts, shut-off valves, sewer invert locations, plugged wyes, tees, etc. On completion of the work, the Contractor shall

incorporate all as-built information on a set of reproducible tracings provided by the Architect and this set of reproducibles shall be delivered to the Architect.

1.15 WARRANTY

A. Contractor shall guarantee the entire plumbing and piping systems unconditionally for a period of one (1) year after final acceptance. If, during this period, any materials, equipment, or any part of the systems fail to function properly, the Contractor shall make good the defects promptly and without any expense to the Owner.

B. Contractor shall be responsible for all damage to any part of the premises caused by leaks in pipelines or equipment furnished and installed under this Section for a period of one (1) year after date of acceptance of his work.

C. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of fuel-fired, domestic-water heaters that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
    a. Structural failures including storage tank and supports.
    b. Faulty operation of controls.
    c. Deterioration of metals, metal finishes, and other materials beyond normal use.
2. Warranty Periods: From date of Substantial Completion.
    a. Commercial, Gas-Fired, Storage, Domestic-Water Heaters:
        1) Storage Tank: Five years.
        2) Controls and Other Components: Two years.
    b. Compression Tanks: Five years.
    c.

PART 2 - PRODUCTS

A. Thermostat-Control, Electric, Tankless, Domestic-Water Heaters:

1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
    a. Chronomite Laboratories, Inc.
    b. Rheem
2. Standard: UL 499 for electric, tankless, (domestic-water heater) heating appliance.
3. Construction: Copper piping or tubing complying with NSF 61 barrier materials for potable water, without storage capacity.
    a. Connections: ASME B1.20.1 pipe thread.
    b. Pressure Rating: 150 psig.
    c. Heating Element: Resistance heating system.

d. Temperature Control: Thermostat.

e. Safety Control: High-temperature-limit cutoff device or system.

f. Jacket: Aluminum or steel with enameled finish or plastic.

4. Support: Bracket for wall mounting.

5. Capacity and Characteristics:

a. Flow Rate: 0.5 GPM at 57°F temperature rise.

b. Temperature Setting: 110 °F.

c. Power Demand: 4,160 watts

d. Electrical Characteristics:

1) Volts: 120.

2) Phases: Single.

3) Hertz: 60.

4) Full-Load Amperes: 20.

2.2 domestic-WATER HEATER ACCESSORIES

A. Domestic-Water Compression Tanks:

1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

a. AMTROL Inc.

b. Smith, A. O. Water Products Co.; a division of A. O. Smith Corporation.

c. Taco, Inc.

2. Description: Steel pressure-rated tank constructed with welded joints and factory-installed butyl-rubber diaphragm. Include air precharge to minimum system-operating pressure at tank.

3. Construction:

a. Tappings: Factory-fabricated steel, welded to tank before testing and labeling. Include ASME B1.20.1 pipe thread.

b. Interior Finish: Comply with NSF 61 barrier materials for potable-water tank linings, including extending finish into and through tank fittings and outlets.

c. Air-Charging Valve: Factory installed.

B. Drain Pans: Corrosion-resistant metal with raised edge. Comply with ANSI/CSA LC 3. Include dimensions not less than base of domestic-water heater, and include drain outlet not less than NPS 3/4 with ASME B1.20.1 pipe threads or with ASME B1.20.7 garden-hose threads.

C. Combination Temperature-and-Pressure Relief Valves: ASME rated and stamped. Include relieving capacity at least as great as heat input, and include pressure setting less than domestic-water heater working-pressure rating. Select relief valves with sensing element that extends into storage tank.

D. Pressure Relief Valves: ASME rated and stamped. Include pressure setting less than domestic-water heater working-pressure rating.

E. Vacuum Relief Valves: ANSI Z21.22/CSA 4.4.

F. Shock Absorbers: ASSE 1010 or PDI-WH 201, Size A water hammer arrester.

G. Domestic-Water Heater Stands: Manufacturer's factory-fabricated steel stand for floor mounting, capable of supporting domestic-water heater and water. Include dimension that will support bottom of domestic-water heater a minimum of 18 inches above the floor.

H. Domestic-Water Heater Mounting Brackets: Manufacturer's factory-fabricated steel bracket for wall mounting, capable of supporting domestic-water heater and water.

2.3 SOURCE QUALITY CONTROL

A. Factory Tests: Test and inspect domestic-water heaters specified to be ASME-code construction, according to ASME Boiler and Pressure Vessel Code.

B. Hydrostatically test commercial domestic-water heaters to minimum of one and one-half times pressure rating before shipment.

C. Electric, domestic-water heaters will be considered defective if they do not pass tests and inspections. Comply with requirements in Section 014000 "Quality Requirements" for retesting and reinspecting requirements and Section 017300 "Execution" for requirements for correcting the Work.

D. Prepare test and inspection reports.

PART 3 - EXECUTION

3.1 DOMESTIC-WATER HEATER INSTALLATION

A. Commercial, Electric, Domestic-Water Heater Mounting: Install commercial, electric, domestic-water heaters on concrete base. Comply with requirements for concrete bases specified in Section 033000 "Cast-in-Place Concrete."

1. Exception: Omit concrete bases for commercial, electric, domestic-water heaters if installation on stand, bracket, suspended platform, or directly on floor is indicated.
2. Maintain manufacturer's recommended clearances.
3. Arrange units so controls and devices that require servicing are accessible.
4. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of concrete base.
5. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete floor.
6. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

7. Install anchor bolts to elevations required for proper attachment to supported equipment.

8. Anchor domestic-water heaters to substrate.

B. Install electric, domestic-water heaters level and plumb, according to layout drawings, original design, and referenced standards. Maintain manufacturer's recommended clearances. Arrange units so controls and devices needing service are accessible.

1. Install shutoff valves on domestic-water-supply piping to domestic-water heaters and on domestic-hot-water outlet piping. Comply with requirements for shutoff valves specified in Section 220523 "General-Duty Valves for Plumbing Piping."

C. Install commercial, electric, domestic-water heaters with seismic-restraint devices. Comply with requirements for seismic-restraint devices specified in Section 220548 "Vibration and Seismic Controls for Plumbing Piping and Equipment."

D. Install combination temperature-and-pressure relief valves in top portion of storage tanks. Use relief valves with sensing elements that extend into tanks. Extend commercial-water-heater relief-valve outlet, with drain piping same as domestic-water piping in continuous downward pitch, and discharge by positive air gap onto closest floor drain.

E. Install combination temperature-and-pressure relief valves in water piping for electric, domestic-water heaters without storage. Extend commercial-water-heater relief-valve outlet, with drain piping same as domestic-water piping in continuous downward pitch, and discharge by positive air gap onto closest floor drain.

F. Install water-heater drain piping as indirect waste to spill by positive air gap into open drains or over floor drains. Install hose-end drain valves at low points in water piping for electric, domestic-water heaters that do not have tank drains. Comply with requirements for hose-end drain valves specified in Section 221119 "Domestic Water Piping Specialties."

G. Install thermometers on outlet piping of electric, domestic-water heaters.

H. Install thermometers on inlet and outlet piping of residential, solar, electric, domestic-water heaters.

I. Assemble and install inlet and outlet piping manifold kits for multiple electric, domestic-water heaters. Fabricate, modify, or arrange manifolds for balanced water flow through each electric, domestic-water heater. Include shutoff valve and thermometer in each domestic-water heater inlet and outlet, and throttling valve in each electric, domestic-water heater outlet. Comply with requirements for valves specified in Section 220523 "General-Duty Valves for Plumbing Piping."

J. Install piping-type heat traps on inlet and outlet piping of electric, domestic-water heater storage tanks without integral or fitting-type heat traps.

K. Fill electric, domestic-water heaters with water.

L. Charge domestic-water compression tanks with air.

3.2 CONNECTIONS

A. Comply with requirements for piping specified in Section 221116 "Domestic Water Piping." Drawings indicate general arrangement of piping, fittings, and specialties.

B. Where installing piping adjacent to electric, domestic-water heaters, allow space for service and maintenance of water heaters. Arrange piping for easy removal of domestic-water heaters.

3.3 IDENTIFICATION

A. Identify system components. Comply with requirements for identification specified in Section 220553 "Identification for Plumbing Piping and Equipment."

3.4 FIELD QUALITY CONTROL

A. Perform tests and inspections.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
2. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
3. Operational Test: After electrical circuitry has been energized, start units to confirm proper operation.
4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

B. Electric, domestic-water heaters will be considered defective if they do not pass tests and inspections. Comply with requirements in Section 014000 "Quality Requirements" for retesting and reinspecting requirements.

C. Prepare test and inspection reports.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain commercial, electric, domestic-water heaters.

END OF SECTION

SECTION 22 42 13 13
COMMERCIAL WATER CLOSETS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Water closets.
2. Flushometer valves.
3. Toilet seats.

1.2 WORK INCLUDED

A. Furnish all labor, materials, services, testing, transportation and equipment necessary for the completion of all plumbing work as indicated on drawings and specified herein. Work materials and equipment not indicated or specified which is necessary for the complete and proper operation of the work of this Section in accordance with the true intent and meaning of the contract documents shall be provided and incorporated at no additional cost to the Owner.

1.3 QUALITY ASSURANCE

A. Code Requirements: All work covered by this Section shall conform to the latest requirements of the following regulations:

1. C.C.R., Title 24, Part 5 (2025 CPC).
2. 2025 California Plumbing Code.
3. National Fire Protection Association.
4. California Division of the State Architect.
5. California State Division of Industrial Safety.
6. County Health Department.
7. Any other legally constituted body-having jurisdiction thereof.
8. Plumbing fixtures and accessories provided in a toilet room or bathing room required to comply with CBC Section 11B-213.2 shall comply with CBC Section 11B-213.3.
9. All single-user toilet facilities shall be identified as a Gender Neutral facilities by a door symbol that complies with CBC Sections 11B-216.8 and 11B-703.2.6.3. no pictogram, text or braille is required on the symbol. If a tactile jamb signage is provided, the signage shall comply with the appropriate technical requirements of CBC Section 11B-703. Examples of appropriate designations are “ALL-GENER RESTROOM”, “RESTROOM’, OR “UNISEX RESTROOM”. DSA BU 17-01.
10. Access plumbing fixtures shall comply with all of the requirements of CBC Division 6.

11. Clearance around accessible water closets and in toilet compartments shall be 60 inches minimum measured perpendicular from the side wall and 56 inches minimum measured perpendicular from the rear wall per CBC Section 11B-604.3.1.
12. Heights and location of all fixtures shall be mounted according to CBC Sections 11B-602 through 11B-612.
13. Accessible fixture controls shall comply with CBC Sections 11B-604.6 for water closets and 11B-604.9.5 for children's water closets.

B. Nothing in the specifications or drawings shall be construed to permit deviation from the requirements of governing codes unless approval for said deviation has been obtained from the legally constituted authorities having jurisdiction and from the Owner's representative.

1.4 DRAWINGS

A. Because of the small-scale drawings, it is not possible to indicate all offsets, fittings and accessories which may be required. The Contractor shall carefully investigate the conditions surrounding installation of his work, furnishing the necessary piping, fittings, valves, traps, and other devices which may be required to complete the installation.

B. The general arrangement indicated on the drawings shall be followed as closely as possible. Coordinate with the Architectural, Structural, Mechanical and Electrical Drawings and the work of other trades prior to installation of piping fixtures and equipment to verify adequate space available for installation of the work shown. In the event a field condition arises which makes it impossible to install the work as indicated, submit, in writing, the proposed departures to the Architect for his approval. Only when Architect's approval is given, in writing, shall Contractor proceed with installation of the work.

C. Special Note: Should the Contractor make changes in the installation differing from what is indicated on the contract drawings and not necessitated due to field conditions as indicated hereinabove, the Contractor shall be required to re-install the work to comply with what has been indicated on the contract drawings. Should it be impossible to re-install the work and the installation is in accordance with all governing authorities, the architect may permit the installation to remain. However, all costs incurred to revise the contract drawings by the engineer for resubmittal to the building department indicating the as-installed condition shall become the responsibility of the Contractor.

D. In case of a difference in the specifications or between the specifications and the drawings, the Contractor shall figure the most expensive alternate and after award of contract, shall secure direction from the Architect.

1.5 PERMITS, INSPECTIONS AND LICENSES

A. All permits, inspections and licenses required by the legally constituted authorities for installation of the work according to the plans and specifications shall be obtained and paid as a part of the work of this section.

1.6 EXAMINATION OF PREMISES

A. Before bidding on this work, Contractors shall make a careful examination of the premises and shall thoroughly familiarize themselves with the requirements of the contract. By the act of submitting a proposal for the work included in this contract, the Contractor shall be deemed to have made such study and examination, and that he is familiar with and accepts all conditions of the site.

1.7 PROTECTION

A. All work, equipment and materials shall be protected at all times. Contractor shall make good all damage caused either directly or indirectly by his own workmen. Contractor shall also protect his own work from damage. He shall close all pipe openings with caps or plugs during installation. He shall protect all his equipment and materials against dirt, water, chemical and mechanical injury. Upon completion, all work shall be thoroughly cleaned and delivered in a new condition.

B. Contractor shall be held responsible for all damage to equipment and materials until he has received written notice from the Architect or Engineer that his work has been accepted.

1.8 LOCATIONS

A. The locations of apparatus, piping and equipment indicated on the drawings are approximate. Piping and equipment shall be installed in such a manner as to avoid all obstruction, preserve headroom, and keep openings and passages clear. The locations of and mounting heights of all fixtures shall be coordinated with the architectural plans and room elevations.

B. Clearances and Openings: Contractor shall cooperate and coordinate his work with all other trades to avoid conflict and permit for a neat and orderly appearance of the entire installation. The Contractor shall, in advance of the work, furnish instructions to the General Contractor as to his requirements for equipment and material installation of any kind, whether or not specifically mentioned on drawings or in the specifications, and shall include recesses, chases in walls, and all required openings in the structure. Should furnishing this information be neglected, delayed or incorrect and additional cuttings are found to be required, the cost of the same shall be charged to this Contractor.

C. Contractor shall verify and coordinate pipe routing with location of all electrical rooms, elevator equipment rooms, telecom/data rooms, and other rooms dedicated to the housing of switchgear, panels, or other electrical equipment. In no case shall piping be installed within or above the ceiling of such rooms.

1.9 SUBMITTAL DATA

A. Submittal Requirements:

1. Furnish, all at one time, prior to any installation, within the time noted below, six (6) copies of valid submittal data on all fixtures, material, equipment and devices. Each submitted item shall be indexed and referenced to these specifications and to identification numbers on fixtures and equipment schedules.

2. Manufacturers' submittal literature and shop drawings are required on all items to ensure the latest and most complete manufacturer's data is available for review. Requirements of the submittals and Engineer's submittal notes are a part of the work of this Division except that Engineer's notes may not be used as a means of increasing the scope of work of this Division.

3. Submittals will be checked for general conformance with the design concept of the project but the review does not guarantee quantities shown and does not supersede requirements of this Division to properly install work.

4. To be valid, all submittals must:

   a. Be delivered to the Architect's office within thirty-five (35) days of award of the contract. Contractor shall make time allowance for Engineer's review, return of comments, if any, and resubmittal if required. Corrections or changes in submittals returned as inadequate or incomplete shall be accomplished within this time limit.

   b. Clearly indicate and label as such any items proposed as substitution for that specified or shown on plans.

   c. Include all pertinent construction, installation, performance and technical data.

   d. Have all product data sheets clearly labeled to indicate the individual items being submitted. In addition, all required options and accessories shall be clearly marked.

      1) Product data sheets corresponding to items indicated on plans shall be clearly labeled with the corresponding fixture or equipment tag number.

      2) Product data sheets corresponding to items indicated in specifications shall be clearly labeled with the specification section, page and item numbers.

   e. Include, for every item which differs in size, configuration, connections, service, accessibility or any other significant way, a drawing to the same (or larger) scale as to the pertinent portions of the contract drawings. In this drawing show a complete layout of the system except that which is identical to the contract drawings, unless the unchanged portions must be shown to indicate such things as clearances. This drawing, together with the contract design drawings must show the complete system as revised to accommodate the proposed alternate.

B. Substitution Requirements:

1. Any items included in submittals and proposed by the Contractor as substitution for that specified or shown on plans shall be submitted within thirty five (35) days of award of the contract. After such time, proposed substitutions shall not be accepted for review, and the Contractor shall submit all items as specified or shown on plans.

   a. For each item proposed as substitution for that specified or shown on plans, copies of product data sheets for the specified item shall be placed side by side with product data sheets for the proposed substitution item within the submittal.

1) In addition to the Submittal Requirements for labeling listed above, product data sheets for the specified item shall be clearly labeled "SPECIFIED ITEM, NOT SUBMITTED". Product data sheets for the corresponding proposed substitution item shall be clearly labeled "PROPOSED SUBSTITUTION".

b. Provide calculations and other detailed data justifying how any items proposed as substitution were selected for proposal. Data must be complete enough to permit detailed comparison of every significant characteristic for which the specified item was analyzed during design.

2. It shall be the Contractor's responsibility to provide sufficient information to allow the Engineer to analyze any proposed alternate. If inadequate information is provided, the proposal will not be approved and resubmittal will not be allowed.

3. The Contractor shall provide or perform tests required by Engineer for purpose of judging acceptability of proposed substitutions.

4. The Contractor assumes full responsibility that alternate items and procedures will meet the job requirements and is responsible for cost of redesign and of modifications to this and other parts of work caused by alternate items furnished under work in this Section. In view of these responsibilities, it is the purpose of these specifications to establish procedures to ensure that the Contractor has considered all the ramifications of proposed alternates before submitting them for review. Submittals which do not comply with the requirements of these specifications or which indicate proposed alternates that were selected without proper regard to the requirements of the job will not be approved. No more than one proposed alternate will be considered for each item.

5. Alternate items installed without Engineer's approval will be replaced with specified items at Contractor's expense.

6. The Architect or his authorized representative shall be the sole judge as to the quality and suitability of proposed alternate equipment, fixtures or materials. Decisions of the Architect or that of his representative shall be final and conclusive.

1.10 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that are packaged with protective covering for storage and identified with labels describing contents.

1. Flushometer-Valve Repair Kits: Equal to 10 percent of amount of each type installed, but no fewer than six of each type.

1.11 UNINSPECTED WORK

A. The Contractor shall not allow or cause any of his work to be covered up or closed in until it has been inspected, tested, approved by all authorities have jurisdiction, and until Project Record drawings have been properly annotated.

B. Should any of his work be covered up or closed in before such inspection, he shall, at his own expense, uncover the work to the satisfaction of the inspection party. All related repair work cost shall be borne by the Contractor.

1.12 RECORD DRAWINGS (Also see General Conditions)

A. Contractor shall provide and keep up-to-date a complete "as-built" record set of blueline prints which shall show every change from the original drawings and the exact "as-built" locations and sizes of the work provided under this Section of the specifications. This set shall include locations, dimensions, depth of buried piping, cleanouts, shut-off valves, sewer invert locations, plugged wyes, tees, etc. On completion of the work, the Contractor shall incorporate all as-built information on a set of reproducible tracings provided by the Architect and this set of reproducibles shall be delivered to the Architect.

1.13 GUARANTEES (Also see General Conditions)

A. Contractor shall guarantee the entire plumbing and piping systems unconditionally for a period of one (1) year after final acceptance. If, during this period, any materials, equipment, or any part of the systems fail to function properly, the Contractor shall make good the defects promptly and without any expense to the Owner.

B. Contractor shall be responsible for all damage to any part of the premises caused by leaks in pipelines or equipment furnished and installed under this Section for a period of one (1) year after date of acceptance of his work.

C. All equipment and fixtures shall carry manufacturer's warranty against defective parts or poor workmanship for not less than one (1) year. See specific equipment specifications for extended warranty requirements.

PART 2 - PRODUCTS

2.1 FLOOR-MOUNTED, BOTTOM-OUTLET WATER CLOSETS

A. Water Closets: Floor mounted, bottom outlet, top spud.

1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
    a. American Standard America.
    b. Kohler Co.
2. Bowl:
    a. Standards: ASME A112.19.2/CSA B45.1 and ASME A112.19.5.
    b. Material: Vitreous china.
    c. Type: Siphon jet.
    d. Style: Flushometer valve.
    e. Height: Standard.
    f. Rim Contour: Elongated.

g. Water Consumption: 1.28 gal. (4.8 L) per flush.

h. Spud Size and Location: NPS 1-1/2 (DN 40); top.

2.2 FLUSHOMETER VALVES

A. Lever-Handle, Diaphragm Flushometer Valves:

1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
   a. Sloan Valve Company.
2. Standard: ASSE 1037.
3. Minimum Pressure Rating: 125 psig (860 kPa).
4. Features: Include integral check stop and backflow-prevention device.
5. Material: Brass body with corrosion-resistant components.
6. Exposed Flushometer-Valve Finish: Chrome plated.
7. Panel Finish: Chrome plated or stainless steel.
8. Style: Exposed.
9. Consumption: 1.28 gal. (4.8 L) per flush.
10. Minimum Inlet: NPS 1 (DN 25).
11. Minimum Outlet: NPS 1-1/4 (DN 32).

2.3 TOILET SEATS

A. Toilet Seats:

1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
   a. Bemis Manufacturing Company.
   b. Olsonite Seat Co.
2. Standard: IAPMO/ANSI Z124.5.
3. Material: Plastic.
4. Type: Commercial (Standard).
5. Shape: Elongated rim, open front.
6. Hinge: Self-sustaining, check.
7. Hinge Material: Noncorroding metal.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Locations and Accessibility: Install equipment for ease of maintenance and repair. If changes in the indicated locations or arrangements are made by the Contractor, they shall be made without additional charges.

B. Openings: Furnish information to the other trades on size and location of openings which are required in walls, slabs, roof, for piping and equipment at the proper times.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

D. Closing-In of Uninspected Work: Do not allow or cause any of the work to be covered up or enclosed until it has been inspected, tested, and approved by the Architect. Any work enclosed or covered prior to such inspection and test shall be uncovered and, after it has been inspected, tested, and approved, make all repairs with such materials as may be necessary to restore all work, including that of other trades, to its original and proper condition.

3.2 INSTALLATION

A. Water-Closet Installation:

1. Install level and plumb according to roughing-in drawings.
2. Install accessible, wall-mounted water closets at mounting height for handicapped/elderly, according to ICC/ANSI A117.1.

B. Flushometer-Valve Installation:

1. Install flushometer-valve, water-supply fitting on each supply to each water closet.
2. Attach supply piping to supports or substrate within pipe spaces behind fixtures.
3. Install lever-handle flushometer valves for accessible water closets with handle mounted on open side of water closet.

C. Install toilet seats on water closets.

D. Wall Flange and Escutcheon Installation:

1. Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations and within cabinets and millwork.
2. Install deep-pattern escutcheons if required to conceal protruding fittings.
3. Comply with escutcheon requirements specified in Section 220518 "Escutcheons for Plumbing Piping."

E. Joint Sealing:

1. Seal joints between water closets and walls and floors using sanitary-type, one-part, mildew-resistant silicone sealant.
2. Match sealant color to water-closet color.
3. Comply with sealant requirements specified in Section 079200 "Joint Sealants."

3.3 CONNECTIONS

A. Connect water closets with water supplies and soil, waste, and vent piping. Use size fittings required to match water closets.

B. Comply with water piping requirements specified in Section 221116 "Domestic Water Piping."

C. Comply with soil and waste piping requirements specified in Section 221316 "Sanitary Waste and Vent Piping."

D. Where installing piping adjacent to water closets, allow space for service and maintenance.

3.4 ADJUSTING

A. Operate and adjust water closets and controls. Replace damaged and malfunctioning water closets, fittings, and controls.

B. Adjust water pressure at flushometer valves to produce proper flow.

C. Install fresh batteries in battery-powered, electronic-sensor mechanisms.

3.5 CLEANING AND PROTECTION

A. Clean water closets and fittings with manufacturers' recommended cleaning methods and materials.

B. Install protective covering for installed water closets and fittings.

C. Do not allow use of water closets for temporary facilities unless approved in writing by Owner.

3.6 PLUMBING FIXTURES

A. Accessible plumbing fixtures shall comply with all of the requirements of CBC Division 6.

B. Heights and location of all accessible fixtures shall be mounted according to CBC Sections 11B-602 through 11B-612.

C. Fixture controls shall comply with CBC Sections 11B-604.6 for water closets

END OF SECTION

SECTION 22 42 16 13
COMMERCIAL LAVATORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Lavatories.
2. Faucets.

1.2 WORK INCLUDED

A. Furnish all labor, materials, services, testing, transportation and equipment necessary for the completion of all plumbing work as indicated on drawings and specified herein. Work materials and equipment not indicated or specified which is necessary for the complete and proper operation of the work of this Section in accordance with the true intent and meaning of the contract documents shall be provided and incorporated at no additional cost to the Owner.

1.3 QUALITY ASSURANCE

A. Code Requirements: All work covered by this Section shall conform to the latest requirements of the following regulations:

1. C.C.R., Title 24, Part 5 (2025 CPC).
2. 2025 California Plumbing Code.
3. National Fire Protection Association.
4. California Division of the State Architect.
5. California State Division of Industrial Safety.
6. County Health Department.
7. Any other legally constituted body-having jurisdiction thereof.
8. Plumbing fixtures and accessories provided in a toilet room or bathing room required to comply with CBC Section 11B-213.2 shall comply with CBC Section 11B-213.3.
9. All single-user toilet facilities shall be identified as a Gender Neutral facilities by a door symbol that complies with CBC Sections 11B-216.8 and 11B-703.2.6.3. no pictogram, text or braille is required on the symbol. If a tactile jamb signage is provided, the signage shall comply with the appropriate technical requirements of CBC Section 11B-703. Examples of appropriate designations are “ALL-GENER RESTROOM”, “RESTROOM’, OR “UNISEX RESTROOM”. DSA BU 17-01.
10. Access plumbing fixtures shall comply with all of the requirements of CBC Division 6.
11. Heights and location of all fixtures shall be mounted according to CBC Sections 11B-602 through 11B-612.

12. Accessible fixture controls shall comply with CBC Sections 11B-606.4 for lavatories and sinks.

13. Accessible lavatories and sinks shall be mounted with the front of the higher of the rim or counter surface 34" maximum above the finish floor or ground. Depth of lavatories or sinks shall not interfere with knee an toe clearance provided in accordance with CBC 11B-306 when forward approach is required CBC Sections 11B-606.3 and 11B606.7.

14. Water supply and drain pipes under accessible lavatories and sinks shall be insulated or otherwise configured to protect against contact. There shall be no sharp or abrasive surfaces under accessible lavatories or sinks. CBC Section 11B-606.5.

B. Nothing in the specifications or drawings shall be construed to permit deviation from the requirements of governing codes unless approval for said deviation has been obtained from the legally constituted authorities having jurisdiction and from the Owner's representative.

1.4 DRAWINGS

A. Because of the small-scale drawings, it is not possible to indicate all offsets, fittings and accessories which may be required. The Contractor shall carefully investigate the conditions surrounding installation of his work, furnishing the necessary piping, fittings, valves, traps, and other devices which may be required to complete the installation.

B. The general arrangement indicated on the drawings shall be followed as closely as possible. Coordinate with the Architectural, Structural, Mechanical and Electrical Drawings and the work of other trades prior to installation of piping fixtures and equipment to verify adequate space available for installation of the work shown. In the event a field condition arises which makes it impossible to install the work as indicated, submit, in writing, the proposed departures to the Architect for his approval. Only when Architect's approval is given, in writing, shall Contractor proceed with installation of the work.

C. Special Note: Should the Contractor make changes in the installation differing from what is indicated on the contract drawings and not necessitated due to field conditions as indicated hereinabove, the Contractor shall be required to re-install the work to comply with what has been indicated on the contract drawings. Should it be impossible to re-install the work and the installation is in accordance with all governing authorities, the architect may permit the installation to remain. However, all costs incurred to revise the contract drawings by the engineer for resubmittal to the building department indicating the as-installed condition shall become the responsibility of the Contractor.

D. In case of a difference in the specifications or between the specifications and the drawings, the Contractor shall figure the most expensive alternate and after award of contract, shall secure direction from the Architect.

1.5 PERMITS, INSPECTIONS AND LICENSES

A. All permits, inspections and licenses required by the legally constituted authorities for installation of the work according to the plans and specifications shall be obtained and paid as a part of the work of this section.

1.6 EXAMINATION OF PREMISES

A. Before bidding on this work, Contractors shall make a careful examination of the premises and shall thoroughly familiarize themselves with the requirements of the contract. By the act of submitting a proposal for the work included in this contract, the Contractor shall be deemed to have made such study and examination, and that he is familiar with and accepts all conditions of the site.

1.7 PROTECTION

A. All work, equipment and materials shall be protected at all times. Contractor shall make good all damage caused either directly or indirectly by his own workmen. Contractor shall also protect his own work from damage. He shall close all pipe openings with caps or plugs during installation. He shall protect all his equipment and materials against dirt, water, chemical and mechanical injury. Upon completion, all work shall be thoroughly cleaned and delivered in a new condition.

B. Contractor shall be held responsible for all damage to equipment and materials until he has received written notice from the Architect or Engineer that his work has been accepted.

1.8 LOCATIONS

A. The locations of apparatus, piping and equipment indicated on the drawings are approximate. Piping and equipment shall be installed in such a manner as to avoid all obstruction, preserve headroom, and keep openings and passages clear. The locations of and mounting heights of all fixtures shall be coordinated with the architectural plans and room elevations.

B. Clearances and Openings: Contractor shall cooperate and coordinate his work with all other trades to avoid conflict and permit for a neat and orderly appearance of the entire installation. The Contractor shall, in advance of the work, furnish instructions to the General Contractor as to his requirements for equipment and material installation of any kind, whether or not specifically mentioned on drawings or in the specifications, and shall include recesses, chases in walls, and all required openings in the structure. Should furnishing this information be neglected, delayed or incorrect and additional cuttings are found to be required, the cost of the same shall be charged to this Contractor.

C. Contractor shall verify and coordinate pipe routing with location of all electrical rooms, elevator equipment rooms, telecom/data rooms, and other rooms dedicated to the housing of switchgear, panels, or other electrical equipment. In no case shall piping be installed within or above the ceiling of such rooms.

1.9 SUBMITTAL DATA

A. Submittal Requirements:

1. Furnish, all at one time, prior to any installation, within the time noted below, six (6) copies of valid submittal data on all fixtures, material, equipment and devices. Each submitted item shall be indexed and referenced to these specifications and to identification numbers on fixtures and equipment schedules.

2. Manufacturers' submittal literature and shop drawings are required on all items to ensure the latest and most complete manufacturer's data is available for review. Requirements of the submittals and Engineer's submittal notes are a part of the work of this Division except that Engineer's notes may not be used as a means of increasing the scope of work of this Division.

3. Submittals will be checked for general conformance with the design concept of the project but the review does not guarantee quantities shown and does not supersede requirements of this Division to properly install work.

4. To be valid, all submittals must:

   a. Be delivered to the Architect's office within thirty-five (35) days of award of the contract. Contractor shall make time allowance for Engineer's review, return of comments, if any, and resubmittal if required. Corrections or changes in submittals returned as inadequate or incomplete shall be accomplished within this time limit.

   b. Clearly indicate and label as such any items proposed as substitution for that specified or shown on plans.

   c. Include all pertinent construction, installation, performance and technical data.

   d. Have all product data sheets clearly labeled to indicate the individual items being submitted. In addition, all required options and accessories shall be clearly marked.

      1) Product data sheets corresponding to items indicated on plans shall be clearly labeled with the corresponding fixture or equipment tag number.

      2) Product data sheets corresponding to items indicated in specifications shall be clearly labeled with the specification section, page and item numbers.

   e. Include, for every item which differs in size, configuration, connections, service, accessibility or any other significant way, a drawing to the same (or larger) scale as to the pertinent portions of the contract drawings. In this drawing show a complete layout of the system except that which is identical to the contract drawings, unless the unchanged portions must be shown to indicate such things as clearances. This drawing, together with the contract design drawings must show the complete system as revised to accommodate the proposed alternate.

B. Substitution Requirements:

1. Any items included in submittals and proposed by the Contractor as substitution for that specified or shown on plans shall be submitted within thirty five (35) days of award of the contract. After such time, proposed substitutions shall not be accepted for review, and the Contractor shall submit all items as specified or shown on plans.

   a. For each item proposed as substitution for that specified or shown on plans, copies of product data sheets for the specified item shall be placed side by side with product data sheets for the proposed substitution item within the submittal.

1) In addition to the Submittal Requirements for labeling listed above, product data sheets for the specified item shall be clearly labeled "SPECIFIED ITEM, NOT SUBMITTED". Product data sheets for the corresponding proposed substitution item shall be clearly labeled "PROPOSED SUBSTITUTION".

b. Provide calculations and other detailed data justifying how any items proposed as substitution were selected for proposal. Data must be complete enough to permit detailed comparison of every significant characteristic for which the specified item was analyzed during design.

2. It shall be the Contractor's responsibility to provide sufficient information to allow the Engineer to analyze any proposed alternate. If inadequate information is provided, the proposal will not be approved and resubmittal will not be allowed.

3. The Contractor shall provide or perform tests required by Engineer for purpose of judging acceptability of proposed substitutions.

4. The Contractor assumes full responsibility that alternate items and procedures will meet the job requirements and is responsible for cost of redesign and of modifications to this and other parts of work caused by alternate items furnished under work in this Section. In view of these responsibilities, it is the purpose of these specifications to establish procedures to ensure that the Contractor has considered all the ramifications of proposed alternates before submitting them for review. Submittals which do not comply with the requirements of these specifications or which indicate proposed alternates that were selected without proper regard to the requirements of the job will not be approved. No more than one proposed alternate will be considered for each item.

5. Alternate items installed without Engineer's approval will be replaced with specified items at Contractor's expense.

6. The Architect or his authorized representative shall be the sole judge as to the quality and suitability of proposed alternate equipment, fixtures or materials. Decisions of the Architect or that of his representative shall be final and conclusive.

1.10 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that are packaged with protective covering for storage and identified with labels describing contents.

1.11 UNINSPECTED WORK

A. The Contractor shall not allow or cause any of his work to be covered up or closed in until it has been inspected, tested, approved by all authorities have jurisdiction, and until Project Record drawings have been properly annotated.

B. Should any of his work be covered up or closed in before such inspection, he shall, at his own expense, uncover the work to the satisfaction of the inspection party. All related repair work cost shall be borne by the Contractor.

1.12 RECORD DRAWINGS (Also see General Conditions)

A. Contractor shall provide and keep up-to-date a complete "as-built" record set of blueline prints which shall show every change from the original drawings and the exact "as-built" locations and sizes of the work provided under this Section of the specifications. This set shall include locations, dimensions, depth of buried piping, cleanouts, shut-off valves, sewer invert locations, plugged wyes, tees, etc. On completion of the work, the Contractor shall incorporate all as-built information on a set of reproducible tracings provided by the Architect and this set of reproducibles shall be delivered to the Architect.

1.13 GUARANTEES

A. Contractor shall guarantee the entire plumbing and piping systems unconditionally for a period of one (1) year after final acceptance. If, during this period, any materials, equipment, or any part of the systems fail to function properly, the Contractor shall make good the defects promptly and without any expense to the Owner.

B. Contractor shall be responsible for all damage to any part of the premises caused by leaks in pipelines or equipment furnished and installed under this Section for a period of one (1) year after date of acceptance of his work.

C. All equipment and fixtures shall carry manufacturer's warranty against defective parts or poor workmanship for not less than one (1) year. See specific equipment specifications for extended warranty requirements.

PART 2 - PRODUCTS

2.1 VITREOUS-CHINA, WALL-MOUNTED LAVATORIES

A. Lavatory: Vitreous china, wall mounted, with back.

1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
    a. American Standard America.
    b. Kohler Co.
2. Fixture:
    a. Standard: ASME A112.19.2/CSA B45.1.
    b. Type: For wall hanging.
    c. Faucet-Hole Location: Top.
    d. Color: White.
    e. Mounting Material: Chair carrier.
3. Support: ASME A112.6.1M, Type II, concealed-arm lavatory carrier.

2.2 VITREOUS-CHINA, SELF-RIMMING LAVATORIES

A. Lavatory: Vitreous china, self-rimming.

1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
    a. American Standard America.
    b. Kohler Co.
2. Fixture:
    a. Standard: ASME A112.19.2/CSA B45.1.
    b. Type: For deck mount.
    c. Faucet-Hole Location: Top.
    d. Color: White.

2.3 VITREOUS-CHINA, UNDERCOUNTER-MOUNTED LAVATORIES

A. Lavatory: Vitreous china, under-counter mounted.
1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
    a. American Standard America.
    b. Kohler Co.
2. Fixture:
    a. Standard: ASME A112.19.2/CSA B45.1.
    b. Type: For deck mounted.
    c. Faucet-Hole Location: Counter.
    d. Color: White.
    e. Mounting Material: Manufacturers recommended installation.

2.4 SOLID-BRASS, MANUALLY OPERATED FAUCETS

A. NSF Standard: Comply with NSF/ANSI 61, "Drinking Water System Components - Health Effects," for faucet materials that will be in contact with potable water.
B. Lavatory Faucets: Manual-type, single-control mixing, commercial, solid-brass valve.
1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
    a. Chicago Faucets.
2. Standard: ASME A112.18.1/CSA B125.1.
3. General: Include hot- and cold-water indicators; coordinate faucet inlets with supplies and fixture hole punchings; coordinate outlet with spout and fixture receptor.
4. Body Material: Commercial, solid brass.
5. Finish: Polished chrome plate.
6. Mounting Type: Deck, exposed.

2.5 SUPPLY FITTINGS

A. NSF Standard: Comply with NSF/ANSI 61, "Drinking Water System Components - Health Effects," for supply-fitting materials that will be in contact with potable water.

B. Standard: ASME A112.18.1/CSA B125.1.

C. Supply Piping: Chrome-plated-brass pipe or chrome-plated copper tube matching water-supply piping size. Include chrome-plated-brass or stainless-steel wall flange.

1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

a. Chicago

D. Supply Stops: Chrome-plated-brass, one-quarter-turn, ball-type or compression valve with inlet connection matching supply piping.

1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

a. Chicago

E. Operation: Loose key.

F. Risers:

1. NPS 3/8.

2. Chrome-plated, rigid-copper-pipe and brass straight or offset tailpieces riser.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Locations and Accessibility: Install equipment for ease of maintenance and repair. If changes in the indicated locations or arrangements are made by the Contractor, they shall be made without additional charges.

B. Openings: Furnish information to the other trades on size and location of openings which are required in walls, slabs, roof, for piping and equipment at the proper times.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

D. Closing-In of Uninspected Work: Do not allow or cause any of the work to be covered up or enclosed until it has been inspected, tested, and approved by the Architect. Any work enclosed or covered prior to such inspection and test shall be uncovered and, after it has been inspected, tested, and approved, make all repairs with such materials as may be necessary to restore all work, including that of other trades, to its original and proper condition.

3.2 INSTALLATION

A. Install lavatories level and plumb according to roughing-in drawings.

B. Install supports, affixed to building substrate, for wall-mounted lavatories.

C. Install accessible wall-mounted lavatories at handicapped/elderly mounting height for people with disabilities or the elderly, according to ICC/ANSI A117.1.

D. Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations. Use deep-pattern escutcheons if required to conceal protruding fittings. Comply with escutcheon requirements specified in Section 220518 "Escutcheons for Plumbing Piping."

E. Seal joints between lavatories, counters, and walls using sanitary-type, one-part, mildew-resistant silicone sealant. Match sealant color to fixture color. Comply with sealant requirements specified in Section 079200 "Joint Sealants."

F. Install protective shielding pipe covers and enclosures on exposed supplies and waste piping of accessible lavatories. Comply with requirements in Section 220719 "Plumbing Piping Insulation."

G. Point of use mixing valve in cabinet to be recessed in wall, under lavatory.

3.3 CONNECTIONS

A. Connect fixtures with water supplies, stops, and risers, and with traps, soil, waste, and vent piping. Use size fittings required to match fixtures.

B. Comply with water piping requirements specified in Section 221116 "Domestic Water Piping."

C. Comply with soil and waste piping requirements specified in Section 221316 "Sanitary Waste and Vent Piping."

3.4 ADJUSTING

A. Operate and adjust lavatories and controls. Replace damaged and malfunctioning lavatories, fittings, and controls.

B. Adjust water pressure at faucets to produce proper flow.

3.5 CLEANING AND PROTECTION

A. After completing installation of lavatories, inspect and repair damaged finishes.

B. Clean lavatories, faucets, and other fittings with manufacturers' recommended cleaning methods and materials.

C. Provide protective covering for installed lavatories and fittings.

D. Do not allow use of lavatories for temporary facilities unless approved in writing by Owner.

3.6 PLUMBING FIXTURES

A. Accessible plumbing fixtures shall comply with all of the requirements of CBC Division 6.

B. Heights and location of all accessible fixtures shall be mounted according to CBC Sections 11B-602 through 11B-612.

C. Fixture controls shall comply with CBC Sections 11B-606.4 for lavatories and sinks.

D. Accessible sinks shall be 6-1/2” deep maximum. Sinks shall be mounted with front of the higher of the rim and counter surface 34” maximum above the finish floor or ground.

E. Water supply and drain pipes under lavatories and sinks shall be insulated or otherwise configured to protect against contact. There shall be no sharp or abrasive surfaces under lavatories and sinks. CBC Section 11B-606.

END OF SECTION

SECTION 23 05 29

HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Metal pipe hangers and supports.
2. Trapeze pipe hangers.
3. Metal framing systems.
4. Thermal-hanger shield inserts.
5. Fastener systems.
6. Pipe stands.
7. Equipment supports.

B. Related Sections:

1. Section 233113 "Metal Ducts" for duct hangers and supports.

1.02 DEFINITIONS

A. MSS: Manufacturers Standardization Society of The Valve and Fittings Industry Inc.

1.03 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design trapeze pipe hangers and equipment supports, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

B. Structural Performance: Hangers and supports for HVAC piping and equipment shall withstand the effects of gravity loads and stresses within limits and under conditions indicated according to ASCE/SEI 7.

1. Design supports for multiple pipes, including pipe stands, capable of supporting combined weight of supported systems, system contents, and test water.
2. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
3. Design seismic-restraint hangers and supports for piping and equipment.

1.04 ACTION SUBMITTALS

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

B. Shop Drawings: Signed and sealed by a qualified professional engineer. Show fabrication and installation details and include calculations for the following; include Product Data for components:

1. Trapeze pipe hangers.
2. Metal framing systems.
3. Fiberglass strut systems.
4. Pipe stands.
5. Equipment supports.

1.05 INFORMATIONAL SUBMITTALS

A. Welding certificates.

1.06 QUALITY ASSURANCE

A. Structural Steel 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.

PART 2 - PRODUCTS

2.01 METAL PIPE HANGERS AND SUPPORTS

A. Carbon-Steel Pipe Hangers and Supports:

1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.
2. Galvanized Metallic Coatings: Pregalvanized or hot dipped.
3. Nonmetallic Coatings: Plastic coating, jacket, or liner.
4. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support bearing surface of piping.
5. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel.

B. Stainless-Steel Pipe Hangers and Supports:

1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.
2. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support bearing surface of piping.
3. Hanger Rods: Continuous-thread rod, nuts, and washer made of stainless steel.

C. Copper Pipe Hangers:

1. Description: MSS SP-58, Types 1 through 58, copper-coated-steel, factory-fabricated components.

2. Hanger Rods: Continuous-thread rod, nuts, and washer made of copper-coated steel.

2.02 TRAPEZE PIPE HANGERS

A. Description: MSS SP-69, Type 59, shop- or field-fabricated pipe-support assembly made from structural carbon-steel shapes with MSS SP-58 carbon-steel hanger rods, nuts, saddles, and U-bolts.

2.03 METAL FRAMING SYSTEMS

A. MFMA Manufacturer Metal Framing Systems:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Allied Tube & Conduit.
      b. Cooper B-Line, Inc.
      c. Flex-Strut Inc.
      d. GS Metals Corp.
      e. Thomas & Betts Corporation.
      f. Unistrut Corporation; Tyco International, Ltd.
   2. Description: Shop- or field-fabricated pipe-support assembly for supporting multiple parallel pipes.
   3. Standard: MFMA-4.
   4. Channels: Continuous slotted steel channel with inturned lips.
   5. Channel Nuts: Formed or stamped steel nuts or other devices designed to fit into channel slot and, when tightened, prevent slipping along channel.
   6. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel.
   7. Metallic Coating: Electroplated zinc.

B. Non-MFMA Manufacturer Metal Framing Systems:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Allied Tube & Conduit.
      b. Cooper B-Line, Inc.
      c. Flex-Strut Inc.
      d. GS Metals Corp.
      e. Thomas & Betts Corporation.
      f. Unistrut Corporation; Tyco International, Ltd.
   2. Description: Shop- or field-fabricated pipe-support assembly made of steel channels, accessories, fittings, and other components for supporting multiple parallel pipes.

3. Standard: Comply with MFMA-4.
4. Channels: Continuous slotted steel channel with inturned lips.
5. Channel Nuts: Formed or stamped steel nuts or other devices designed to fit into channel slot and, when tightened, prevent slipping along channel.
6. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel.
7. Coating: Zinc.

2.04 THERMAL-HANGER SHIELD INSERTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Carpenter & Paterson, Inc.
   2. Clement Support Services.
   3. ERICO International Corporation.
   4. National Pipe Hanger Corporation.
   5. PHS Industries, Inc.
   6. Pipe Shields, Inc.; a subsidiary of Piping Technology & Products, Inc.
   7. Piping Technology & Products, Inc.
   8. Rilco Manufacturing Co., Inc.
   9. Value Engineered Products, Inc.

B. Insulation-Insert Material for Cold Piping: Water-repellent treated, ASTM C 533, Type I calcium silicate with 100-psig minimum compressive strength.

C. Insulation-Insert Material for Hot Piping: Water-repellent treated, ASTM C 533, Type I calcium silicate with 100-psig minimum compressive strength.

D. For Trapeze or Clamped Systems: Insert and shield shall cover entire circumference of pipe.

E. For Clevis or Band Hangers: Insert and shield shall cover lower 180 degrees of pipe.

F. Insert Length: Extend 2 inches beyond sheet metal shield for piping operating below ambient air temperature.

2.05 FASTENER SYSTEMS

A. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

B. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel anchors, for use in hardened portland cement concrete; with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

2.06 PIPE STANDS

A. General Requirements for Pipe Stands: Shop- or field-fabricated assemblies made of manufactured corrosion-resistant components to support roof-mounted piping.

B. Compact Pipe Stand: One-piece plastic unit with integral-rod roller, pipe clamps, or V-shaped cradle to support pipe, for roof installation without membrane penetration.

C. Low-Type, Single-Pipe Stand: One-piece plastic base unit with plastic roller, for roof installation without membrane penetration.

D. High-Type, Single-Pipe Stand:

1. Description: Assembly of base, vertical and horizontal members, and pipe support, for roof installation without membrane penetration.
2. Base: Plastic.
3. Vertical Members: Two or more cadmium-plated-steel or stainless-steel, continuous-thread rods.
4. Horizontal Member: Cadmium-plated-steel or stainless-steel rod with plastic or stainless-steel, roller-type pipe support.

E. High-Type, Multiple-Pipe Stand:

1. Description: Assembly of bases, vertical and horizontal members, and pipe supports, for roof installation without membrane penetration.
2. Bases: One or more; plastic.
3. Vertical Members: Two or more protective-coated-steel channels.
4. Horizontal Member: Protective-coated-steel channel.
5. Pipe Supports: Galvanized-steel, clevis-type pipe hangers.

F. Curb-Mounted-Type Pipe Stands: Shop- or field-fabricated pipe supports made from structural-steel shapes, continuous-thread rods, and rollers, for mounting on permanent stationary roof curb.

2.07 EQUIPMENT SUPPORTS

A. Description: Welded, shop- or field-fabricated equipment support made from structural carbon-steel shapes.

2.08 MISCELLANEOUS MATERIALS

A. Structural Steel: ASTM A 36/A 36M, carbon-steel plates, shapes, and bars; black and galvanized.

B. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, nonshrink and nonmetallic grout; suitable for interior and exterior applications.

1. Properties: Nonstaining, noncorrosive, and nongaseous.

2. Design Mix: 5000-psi, 28-day compressive strength.

PART 3 - EXECUTION

3.01 HANGER AND SUPPORT INSTALLATION

A. Metal Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from the building structure.

B. Metal Trapeze Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Arrange for grouping of parallel runs of horizontal piping, and support together on field-fabricated trapeze pipe hangers.

1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified for individual pipe hangers.
2. Field fabricate from ASTM A 36/A 36M, carbon-steel shapes selected for loads being supported. Weld steel according to AWS D1.1/D1.1M.

C. Metal Framing System Installation: Arrange for grouping of parallel runs of piping, and support together on field-assembled metal framing systems.

D. Fiberglass Strut System Installation: Arrange for grouping of parallel runs of piping, and support together on field-assembled fiberglass struts.

E. Thermal-Hanger Shield Installation: Install in pipe hanger or shield for insulated piping.

F. Fastener System Installation:

1. Install powder-actuated fasteners for use in lightweight concrete or concrete slabs less than 4 inches thick in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.
2. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.

G. Pipe Stand Installation:

1. Pipe Stand Types except Curb-Mounted Type: Assemble components and mount on smooth roof surface. Do not penetrate roof membrane.

H. Install hangers and supports complete with necessary attachments, inserts, bolts, rods, nuts, washers, and other accessories.

I. Equipment Support Installation: Fabricate from welded-structural-steel shapes.

J. 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.

K. Install lateral bracing with pipe hangers and supports to prevent swaying.

L. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, **NPS 2-1/2** and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.

M. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.

N. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and to not exceed maximum pipe deflections allowed by ASME B31.9 for building services piping.

O. Insulated Piping:

1. Attach clamps and spacers to piping.
    a. Piping Operating above Ambient Air Temperature: Clamp may project through insulation.
    b. Piping Operating below Ambient Air Temperature: Use thermal-hanger shield insert with clamp sized to match OD of insert.
    c. Do not exceed pipe stress limits allowed by ASME B31.9 for building services piping.
2. Install MSS SP-58, Type 39, protection saddles if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.
    a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.
3. Install MSS SP-58, Type 40, protective shields on cold piping with vapor barrier. Shields shall span an arc of 180 degrees.
    a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.
4. Shield Dimensions for Pipe: Not less than the following:
    a. NPS 1/4 to NPS 3-1/2: 12 inches long and 0.048 inch thick.
    b. NPS 4: 12 inches long and 0.06 inch thick.
    c. NPS 5 and NPS 6: 18 inches long and 0.06 inch thick.
    d. NPS 8 to NPS 14: 24 inches long and 0.075 inch thick.
    e. NPS 16 to NPS 24: 24 inches long and 0.105 inch thick.
5. Pipes NPS 8 and Larger: Include wood or reinforced calcium-silicate-insulation inserts of length at least as long as protective shield.
6. Thermal-Hanger Shields: Install with insulation same thickness as piping insulation.

3.02 EQUIPMENT SUPPORTS

A. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.

B. Grouting: Place grout under supports for equipment and make bearing surface smooth.

C. Provide lateral bracing, to prevent swaying, for equipment supports.

3.03 METAL FABRICATIONS

A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers and equipment supports.

B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.

C. Field Welding: Comply with AWS D1.1/D1.1M procedures for shielded, metal arc welding; appearance and quality of welds; and methods used in correcting welding work; and with the following:

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 welding flux immediately.
4. Finish welds at exposed connections so no roughness shows after finishing and so contours of welded surfaces match adjacent contours.

3.04 ADJUSTING

A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.

B. Trim excess length of continuous-thread hanger and support rods to 1-1/2 inches.

3.05 PAINTING

A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.

1. Apply paint by brush or spray to provide a minimum dry film thickness of 2.0 mils.

B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

3.06 HANGER AND SUPPORT SCHEDULE

A. Specific hanger and support requirements are in Sections specifying piping systems and equipment.

B. Comply with MSS SP-69 for pipe-hanger selections and applications that are not specified in piping system Sections.

C. Use hangers and supports with galvanized metallic coatings for piping and equipment that will not have field-applied finish.

D. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.

E. Use carbon-steel pipe hangers and supports and metal framing systems and attachments for general service applications.

F. Use stainless-steel pipe hangers and stainless-steel attachments for hostile environment applications.

G. Use copper-plated pipe hangers and copper attachments for copper piping and tubing.

H. Use padded hangers for piping that is subject to scratching.

I. Use thermal-hanger shield inserts for insulated piping and tubing.

J. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Adjustable, Steel Clevis Hangers (MSS Type 1): For suspension of noninsulated or insulated, stationary pipes NPS 1/2 to NPS 30.
2. Yoke-Type Pipe Clamps (MSS Type 2): For suspension of up to 1050 deg F, pipes NPS 4 to NPS 24, requiring up to 4 inches of insulation.
3. Carbon- or Alloy-Steel, Double-Bolt Pipe Clamps (MSS Type 3): For suspension of pipes NPS 3/4 to NPS 36, requiring clamp flexibility and up to 4 inches of insulation.
4. Steel Pipe Clamps (MSS Type 4): For suspension of cold and hot pipes NPS 1/2 to NPS 24 if little or no insulation is required.
5. Pipe Hangers (MSS Type 5): For suspension of pipes NPS 1/2 to NPS 4, to allow off-center closure for hanger installation before pipe erection.
6. Adjustable, Swivel Split- or Solid-Ring Hangers (MSS Type 6): For suspension of noninsulated, stationary pipes NPS 3/4 to NPS 8.
7. Adjustable, Steel Band Hangers (MSS Type 7): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8.
8. Adjustable Band Hangers (MSS Type 9): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8.

9. Adjustable, Swivel-Ring Band Hangers (MSS Type 10): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8.
10. Split Pipe Ring with or without Turnbuckle Hangers (MSS Type 11): For suspension of noninsulated, stationary pipes NPS 3/8 to NPS 8.
11. Extension Hinged or Two-Bolt Split Pipe Clamps (MSS Type 12): For suspension of noninsulated, stationary pipes NPS 3/8 to NPS 3.
12. U-Bolts (MSS Type 24): For support of heavy pipes NPS 1/2 to NPS 30.
13. Clips (MSS Type 26): For support of insulated pipes not subject to expansion or contraction.
14. Pipe Saddle Supports (MSS Type 36): For support of pipes NPS 4 to NPS 36, with steel-pipe base stanchion support and cast-iron floor flange or carbon-steel plate.
15. Pipe Stanchion Saddles (MSS Type 37): For support of pipes NPS 4 to NPS 36, with steel-pipe base stanchion support and cast-iron floor flange or carbon-steel plate, and with U-bolt to retain pipe.
16. Adjustable Pipe Saddle Supports (MSS Type 38): For stanchion-type support for pipes NPS 2-1/2 to NPS 36 if vertical adjustment is required, with steel-pipe base stanchion support and cast-iron floor flange.
17. Single-Pipe Rolls (MSS Type 41): For suspension of pipes NPS 1 to NPS 30, from two rods if longitudinal movement caused by expansion and contraction might occur.
18. Adjustable Roller Hangers (MSS Type 43): For suspension of pipes NPS 2-1/2 to NPS 24, from single rod if horizontal movement caused by expansion and contraction might occur.
19. Complete Pipe Rolls (MSS Type 44): For support of pipes NPS 2 to NPS 42 if longitudinal movement caused by expansion and contraction might occur but vertical adjustment is not necessary.
20. Pipe Roll and Plate Units (MSS Type 45): For support of pipes NPS 2 to NPS 24 if small horizontal movement caused by expansion and contraction might occur and vertical adjustment is not necessary.
21. Adjustable Pipe Roll and Base Units (MSS Type 46): For support of pipes NPS 2 to NPS 30 if vertical and lateral adjustment during installation might be required in addition to expansion and contraction.

K. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers NPS 3/4 to NPS 24.
2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers NPS 3/4 to NPS 24 if longer ends are required for riser clamps.

L. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Steel Turnbuckles (MSS Type 13): For adjustment up to 6 inches for heavy loads.
2. Steel Clevises (MSS Type 14): For 120 to 450 deg F piping installations.
3. Swivel Turnbuckles (MSS Type 15): For use with MSS Type 11, split pipe rings.
4. Malleable-Iron Sockets (MSS Type 16): For attaching hanger rods to various types of building attachments.
5. Steel Weldless Eye Nuts (MSS Type 17): For 120 to 450 deg F piping installations.

M. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
2. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joist construction, to attach to top flange of structural shape.
3. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.
4. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.
5. Welded Beam Attachments (MSS Type 22): For attaching to bottom of beams if loads are considerable and rod sizes are large.
6. C-Clamps (MSS Type 23): For structural shapes.
7. Top-Beam Clamps (MSS Type 25): For top of beams if hanger rod is required tangent to flange edge.
8. Side-Beam Clamps (MSS Type 27): For bottom of steel I-beams.
9. Steel-Beam Clamps with Eye Nuts (MSS Type 28): For attaching to bottom of steel I-beams for heavy loads.
10. Linked-Steel Clamps with Eye Nuts (MSS Type 29): For attaching to bottom of steel I-beams for heavy loads, with link extensions.
11. Malleable-Beam Clamps with Extension Pieces (MSS Type 30): For attaching to structural steel.
12. Welded-Steel Brackets: For support of pipes from below or for suspending from above by using clip and rod. Use one of the following for indicated loads:
    a. Light (MSS Type 31): 750 lb.
    b. Medium (MSS Type 32): 1500 lb.
    c. Heavy (MSS Type 33): 3000 lb.
13. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.
14. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.
15. Horizontal Travelers (MSS Type 58): For supporting piping systems subject to linear horizontal movement where headroom is limited.

N. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Steel-Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.
2. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.
3. Thermal-Hanger Shield Inserts: For supporting insulated pipe.

O. Spring Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Restraint-Control Devices (MSS Type 47): Where indicated to control piping movement.
2. Spring Cushions (MSS Type 48): For light loads if vertical movement does not exceed 1-1/4 inches.
3. Spring-Cushion Roll Hangers (MSS Type 49): For equipping Type 41, roll hanger with springs.
4. Spring Sway Braces (MSS Type 50): To retard sway, shock, vibration, or thermal expansion in piping systems.
5. Variable-Spring Hangers (MSS Type 51): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from hanger.
6. Variable-Spring Base Supports (MSS Type 52): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from base support.
7. Variable-Spring Trapeze Hangers (MSS Type 53): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from trapeze support.
8. Constant Supports: For critical piping stress and if necessary to avoid transfer of stress from one support to another support, critical terminal, or connected equipment. Include auxiliary stops for erection, hydrostatic test, and load-adjustment capability. These supports include the following types:
    a. Horizontal (MSS Type 54): Mounted horizontally.
    b. Vertical (MSS Type 55): Mounted vertically.
    c. Trapeze (MSS Type 56): Two vertical-type supports and one trapeze member.

P. Comply with MSS SP-69 for trapeze pipe-hanger selections and applications that are not specified in piping system Sections.

Q. Comply with MFMA-103 for metal framing system selections and applications that are not specified in piping system Sections.

R. Use mechanical-expansion anchors instead of building attachments where required in concrete construction.

END OF SECTION

SECTION 23 05 53

IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Equipment labels.
2. Duct labels.

1.02 ACTION SUBMITTALS

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

B. Equipment Label Schedule: Include a listing of all equipment to be labeled with the proposed content for each label.

C. Valve numbering scheme.

D. Valve Schedules: For each piping system to include in maintenance manuals.

1.03 COORDINATION

A. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.

B. Coordinate installation of identifying devices with locations of access panels and doors.

C. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.01 EQUIPMENT LABELS

A. Plastic Labels for Equipment:

1. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.
2. Letter Color: White.
3. Background Color: Black.
4. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
5. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
6. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
7. Fasteners: Stainless-steel self-tapping screws.

8. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

B. Label Content: Include equipment's unique equipment number.

C. Equipment Label Schedule: For each item of equipment to be labeled, on 8-1/2-by-11-inch bond paper. Tabulate equipment identification number, manufacturer, model number, and identify Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified. Equipment schedule shall be included in operation and maintenance data.

2.02 DUCT LABELS

A. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.

B. Maximum Temperature: Able to withstand temperatures up to 160 deg F.

C. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.

D. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.

E. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

F. Duct Label Contents: Include identification of duct service using same designations or abbreviations as used on Drawings, duct size, and an arrow indicating flow direction.

1. Flow-Direction Arrows: Integral with duct system service lettering to accommodate both directions, or as separate unit on each duct label to indicate flow direction.

2. Lettering Size: At least 1-1/2 inches high.

PART 3 - EXECUTION

3.01 PREPARATION

A. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.

3.02 EQUIPMENT LABEL INSTALLATION

A. Install or permanently fasten labels on each major item of mechanical equipment.

B. Locate equipment labels where accessible and visible.

3.03 DUCT LABEL INSTALLATION

A. Install plastic-laminated duct labels with permanent adhesive on air ducts in the following color codes:

1. Blue: For cold-air supply ducts.

2. Yellow: For hot-air supply ducts.
3. Green: For exhaust-, outside-, relief-, return-, and mixed-air ducts.
4. ASME A13.1 Colors and Designs: For hazardous material exhaust.

B. Locate labels near points where ducts enter into concealed spaces and at maximum intervals of 50 feet in each space where ducts are exposed or concealed by removable ceiling system.

END OF SECTION

SECTION 23 05 93

TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Balancing Air Systems:

a. Constant-volume air systems.

1.02 DEFINITIONS

A. AABC: Associated Air Balance Council.

B. TAB: Testing, adjusting, and balancing.

C. TAB Specialist: An entity engaged to perform TAB Work.

1.03 INFORMATIONAL SUBMITTALS

A. Qualification Data: Within 30 days of Contractor's Notice to Proceed, submit documentation that the TAB contractor and this Project's TAB team members meet the qualifications specified in "Quality Assurance" Article.

B. Contract Documents Examination Report: Within 30 days of Contractor's Notice to Proceed, submit the Contract Documents review report as specified in Part 3.

C. Strategies and Procedures Plan: Within 30 days of Contractor's Notice to Proceed, submit TAB strategies and step-by-step procedures as specified in "Preparation" Article.

D. Certified TAB reports.

E. Sample report forms.

F. Instrument calibration reports, to include the following:

1. Instrument type and make.

2. Serial number.

3. Application.

4. Dates of use.

5. Dates of calibration.

1.04 QUALITY ASSURANCE

A. TAB Contractor Qualifications: Engage a TAB entity certified by AABC.

1. TAB Field Supervisor: Employee of the TAB contractor and certified by AABC.

2. TAB Technician: Employee of the TAB contractor and who is certified by AABC as a TAB technician.

B. Certify TAB field data reports and perform the following:

1. Review field data reports to validate accuracy of data and to prepare certified TAB reports.

2. Certify that the TAB team complied with the approved TAB plan and the procedures specified and referenced in this Specification.

C. TAB Report Forms: Use standard TAB contractor's forms approved by Owner.

D. Instrumentation Type, Quantity, Accuracy, and Calibration: As described in ASHRAE 111, Section 5, "Instrumentation."

E. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1, Section 7.2.2 - "Air Balancing."

F. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1, Section 6.7.2.3 - "System Balancing."

1.05 PROJECT CONDITIONS

A. Full Owner Occupancy: Owner will occupy the site during entire TAB period. Cooperate with Owner during TAB operations to minimize conflicts with Owner's operations.

1.06 COORDINATION

A. Notice: Provide seven days' advance notice for each test. Include scheduled test dates and times.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine the Contract Documents to become familiar with Project requirements and to discover conditions in systems' designs that may preclude proper TAB of systems and equipment.

B. Examine systems for installed balancing devices, such as test ports, gage cocks, thermometer wells, flow-control devices, balancing valves and fittings, and manual volume dampers. Verify that locations of these balancing devices are accessible.

C. Examine the approved submittals for HVAC systems and equipment.

D. Examine design data including HVAC system descriptions, statements of design assumptions for environmental conditions and systems' output, and statements of philosophies and assumptions about HVAC system and equipment controls.

E. Examine ceiling plenums and underfloor air plenums used for supply, return, or relief air to verify that they meet the leakage class of connected ducts as specified in Section 233113 "Metal Ducts" and are properly separated from adjacent areas. Verify that penetrations in plenum walls are sealed and fire-stopped if required.

F. Examine equipment performance data including fan and pump curves.

1. Relate performance data to Project conditions and requirements, including system effects that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system.

2. Calculate system-effect factors to reduce performance ratings of HVAC equipment when installed under conditions different from the conditions used to rate equipment performance. To calculate system effects for air systems, use tables and charts found in AMCA 201, "Fans and Systems," or in SMACNA's "HVAC Systems - Duct Design." Compare results with the design data and installed conditions.

G. Examine system and equipment installations and verify that field quality-control testing, cleaning, and adjusting specified in individual Sections have been performed.

H. Examine test reports specified in individual system and equipment Sections.

I. Examine HVAC equipment and filters and verify that bearings are greased, belts are aligned and tight, and equipment with functioning controls is ready for operation.

J. Examine strainers. Verify that startup screens are replaced by permanent screens with indicated perforations.

K. Examine heat-transfer coils for correct piping connections and for clean and straight fins.

L. Examine system pumps to ensure absence of entrained air in the suction piping.

M. Examine operating safety interlocks and controls on HVAC equipment.

N. Report deficiencies discovered before and during performance of TAB procedures. Observe and record system reactions to changes in conditions. Record default set points if different from indicated values.

3.02 PREPARATION

A. Prepare a TAB plan that includes strategies and step-by-step procedures.

B. Complete system-readiness checks and prepare reports. Verify the following:

1. Permanent electrical-power wiring is complete.

2. Automatic temperature-control systems are operational.

3. Equipment and duct access doors are securely closed.

4. Balance, smoke, and fire dampers are open.

5. Isolating and balancing valves are open and control valves are operational.

6. Ceilings are installed in critical areas where air-pattern adjustments are required and access to balancing devices is provided.

7. Windows and doors can be closed so indicated conditions for system operations can be met.

3.03 GENERAL PROCEDURES FOR TESTING AND BALANCING

A. Perform testing and balancing procedures on each system according to the procedures contained in AABC's "National Standards for Total System Balance", ASHRAE 111, and SMACNA's "HVAC Systems - Testing, Adjusting, and Balancing" and in this Section.

1. Comply with requirements in ASHRAE 62.1, Section 7.2.2 - "Air Balancing."

B. Cut insulation, ducts, pipes, and equipment cabinets for installation of test probes to the minimum extent necessary for TAB procedures.

1. After testing and balancing, patch probe holes in ducts with same material and thickness as used to construct ducts.

2. After testing and balancing, install test ports and duct access doors that comply with requirements in Section 233300 "Air Duct Accessories."

3. Install and join new insulation that matches removed materials. Restore insulation, coverings, vapor barrier, and finish according to Section 230713 "Duct Insulation."

C. Mark equipment and balancing devices, including damper-control positions, valve position indicators, fan-speed-control levers, and similar controls and devices, with paint or other suitable, permanent identification material to show final settings.

D. Take and report testing and balancing measurements in inch-pound (IP) units.

3.04 GENERAL PROCEDURES FOR BALANCING AIR SYSTEMS

A. Prepare test reports for both fans and outlets. Obtain manufacturer's outlet factors and recommended testing procedures. Crosscheck the summation of required outlet volumes with required fan volumes.

B. Prepare schematic diagrams of systems' "as-built" duct layouts.

C. For variable-air-volume systems, develop a plan to simulate diversity.

D. Determine the best locations in main and branch ducts for accurate duct-airflow measurements.

E. Check airflow patterns from the outdoor-air louvers and dampers and the return- and exhaust-air dampers through the supply-fan discharge and mixing dampers.

F. Locate start-stop and disconnect switches, electrical interlocks, and motor starters.

G. Verify that motor starters are equipped with properly sized thermal protection.

H. Check dampers for proper position to achieve desired airflow path.

I. Check for airflow blockages.

J. Check condensate drains for proper connections and functioning.

K. Check for proper sealing of air-handling-unit components.

L. Verify that air duct system is sealed as specified in Section 233113 "Metal Ducts."

3.05 PROCEDURES FOR CONSTANT-VOLUME AIR SYSTEMS

A. Adjust fans to deliver total indicated airflows within the maximum allowable fan speed listed by fan manufacturer.

1. Measure total airflow.

    a. Where sufficient space in ducts is unavailable for Pitot-tube traverse measurements, measure airflow at terminal outlets and inlets and calculate the total airflow.

2. Measure fan static pressures as follows to determine actual static pressure:

    a. Measure outlet static pressure as far downstream from the fan as practical and upstream from restrictions in ducts such as elbows and transitions.

    b. Measure static pressure directly at the fan outlet or through the flexible connection.

    c. Measure inlet static pressure of single-inlet fans in the inlet duct as near the fan as possible, upstream from the flexible connection, and downstream from duct restrictions.

d. Measure inlet static pressure of double-inlet fans through the wall of the plenum that houses the fan.

3. Measure static pressure across each component that makes up an air-handling unit, rooftop unit, and other air-handling and -treating equipment.

   a. Report the cleanliness status of filters and the time static pressures are measured.

4. Measure static pressures entering and leaving other devices, such as sound traps, heat-recovery equipment, and air washers, under final balanced conditions.

5. Review Record Documents to determine variations in design static pressures versus actual static pressures. Calculate actual system-effect factors. Recommend adjustments to accommodate actual conditions.

6. Obtain approval from Owner for adjustment of fan speed higher or lower than indicated speed. Comply with requirements in HVAC Sections for air-handling units for adjustment of fans, belts, and pulley sizes to achieve indicated air-handling-unit performance.

7. Do not make fan-speed adjustments that result in motor overload. Consult equipment manufacturers about fan-speed safety factors. Modulate dampers and measure fan-motor amperage to ensure that no overload will occur. Measure amperage in full-cooling, full-heating, economizer, and any other operating mode to determine the maximum required brake horsepower.

B. Adjust volume dampers for main duct, submain ducts, and major branch ducts to indicated airflows within specified tolerances.

1. Measure airflow of submain and branch ducts.

   a. Where sufficient space in submain and branch ducts is unavailable for Pitot-tube traverse measurements, measure airflow at terminal outlets and inlets and calculate the total airflow for that zone.

2. Measure static pressure at a point downstream from the balancing damper, and adjust volume dampers until the proper static pressure is achieved.

3. Remeasure each submain and branch duct after all have been adjusted. Continue to adjust submain and branch ducts to indicated airflows within specified tolerances.

C. Measure air outlets and inlets without making adjustments.

1. Measure terminal outlets using a direct-reading hood or outlet manufacturer's written instructions and calculating factors.

D. Adjust air outlets and inlets for each space to indicated airflows within specified tolerances of indicated values. Make adjustments using branch volume dampers rather than extractors and the dampers at air terminals.

1. Adjust each outlet in same room or space to within specified tolerances of indicated quantities without generating noise levels above the limitations prescribed by the Contract Documents.

2. Adjust patterns of adjustable outlets for proper distribution without drafts.

3.06 PROCEDURES FOR MOTORS

A. Motors, 1/2 HP and Larger: Test at final balanced conditions and record the following data:

1. Manufacturer's name, model number, and serial number.

2. Motor horsepower rating.

3. Motor rpm.

4. Efficiency rating.

5. Nameplate and measured voltage, each phase.

6. Nameplate and measured amperage, each phase.

7. Starter thermal-protection-element rating.

B. Motors Driven by Variable-Frequency Controllers: Test for proper operation at speeds varying from minimum to maximum. Test the manual bypass of the controller to prove proper operation. Record observations including name of controller manufacturer, model number, serial number, and nameplate data.

3.07 PROCEDURES FOR CONDENSING UNITS

A. Verify proper rotation of fans.

B. Measure entering- and leaving-air temperatures.

C. Record compressor data.

3.08 TOLERANCES

A. Set HVAC system's air flow rates and water flow rates within the following tolerances:

1. Supply, Return, and Exhaust Fans and Equipment with Fans: Plus or minus 10 percent.

2. Air Outlets and Inlets: Plus or minus 10 percent.

3. Heating-Water Flow Rate: Plus or minus 10 percent.

4. Cooling-Water Flow Rate: Plus or minus 10 percent.

3.09 REPORTING

A. Initial Construction-Phase Report: Based on examination of the Contract Documents as specified in "Examination" Article, prepare a report on the adequacy of design for systems' balancing devices. Recommend changes and additions to systems' balancing devices to facilitate proper performance measuring and balancing. Recommend changes and additions to HVAC systems and general construction to allow access for performance measuring and balancing devices.

3.10 FINAL REPORT

A. General: Prepare a certified written report; tabulate and divide the report into separate sections for tested systems and balanced systems.

1. Include a certification sheet at the front of the report's binder, signed and sealed by the certified testing and balancing engineer.

2. Include a list of instruments used for procedures, along with proof of calibration.

B. Final Report Contents: In addition to certified field-report data, include the following:

1. Fan curves.

2. Manufacturers' test data.

3. Field test reports prepared by system and equipment installers.

4. Other information relative to equipment performance; do not include Shop Drawings and product data.

C. General Report Data: In addition to form titles and entries, include the following data:

1. Title page.

2. Name and address of the TAB contractor.

3. Project name.

4. Project location.

5. Architect's name and address.

6. Engineer's name and address.

7. Contractor's name and address.

8. Report date.

9. Signature of TAB supervisor who certifies the report.

10. Table of Contents with the total number of pages defined for each section of the report. Number each page in the report.

11. Summary of contents including the following:

    a. Indicated versus final performance.
    b. Notable characteristics of systems.
    c. Description of system operation sequence if it varies from the Contract Documents.

12. Nomenclature sheets for each item of equipment.

13. Data for terminal units, including manufacturer's name, type, size, and fittings.

14. Notes to explain why certain final data in the body of reports vary from indicated values.

15. Test conditions for fans and pump performance forms including the following:

    a. Settings for outdoor-, return-, and exhaust-air dampers.
    b. Conditions of filters.
    c. Cooling coil, wet- and dry-bulb conditions.
    d. Face and bypass damper settings at coils.
    e. Fan drive settings including settings and percentage of maximum pitch diameter.
    f. Inlet vane settings for variable-air-volume systems.
    g. Settings for supply-air, static-pressure controller.
    h. Other system operating conditions that affect performance.

D. System Diagrams: Include schematic layouts of air and hydronic distribution systems. Present each system with single-line diagram and include the following:

1. Quantities of outdoor, supply, return, and exhaust airflows.

2. Duct, outlet, and inlet sizes.

3. Pipe and valve sizes and locations.

4. Position of balancing devices.

E. Fan Test Reports: For supply, return, and exhaust fans, include the following:

1. Fan Data:

    a. System identification.
    b. Location.
    c. Make and type.
    d. Model number and size.
    e. Manufacturer's serial number.
    f. Arrangement and class.
    g. Sheave make, size in inches, and bore.

h. Center-to-center dimensions of sheave, and amount of adjustments in inches.

2. Motor Data:

a. Motor make, and frame type and size.
b. Horsepower and rpm.
c. Volts, phase, and hertz.
d. Full-load amperage and service factor.
e. Sheave make, size in inches, and bore.
f. Center-to-center dimensions of sheave, and amount of adjustments in inches.
g. Number, make, and size of belts.

3. Test Data (Indicated and Actual Values):

a. Total airflow rate in cfm.
b. Total system static pressure in inches wg.
c. Fan rpm.
d. Discharge static pressure in inches wg.
e. Suction static pressure in inches wg.

F. Round, Flat-Oval, and Rectangular Duct Traverse Reports: Include a diagram with a grid representing the duct cross-section and record the following:

1. Report Data:

a. System and air-handling-unit number.
b. Location and zone.
c. Traverse air temperature in deg F.
d. Duct static pressure in inches wg.
e. Duct size in inches.
f. Duct area in sq. ft..
g. Indicated air flow rate in cfm.
h. Indicated velocity in fpm.
i. Actual air flow rate in cfm.
j. Actual average velocity in fpm.
k. Barometric pressure in psig.

G. Instrument Calibration Reports:

1. Report Data:

a. Instrument type and make.

b. Serial number.

c. Application.

d. Dates of use.

e. Dates of calibration.

3.11 INSPECTIONS

A. Initial Inspection:

1. After testing and balancing are complete, operate each system and randomly check measurements to verify that the system is operating according to the final test and balance readings documented in the final report.

2. Check the following for each system:

a. Measure airflow of at least 10 percent of air outlets.

b. Measure water flow of at least 5 percent of terminals.

c. Measure room temperature at each thermostat/temperature sensor. Compare the reading to the set point.

d. Verify that balancing devices are marked with final balance position.

e. Note deviations from the Contract Documents in the final report.

B. Final Inspection:

1. After initial inspection is complete and documentation by random checks verifies that testing and balancing are complete and accurately documented in the final report, request that a final inspection be made by Owner.

2. The TAB contractor's test and balance engineer shall conduct the inspection in the presence of Owner.

3. Owner shall randomly select measurements, documented in the final report, to be rechecked. Rechecking shall be limited to either 10 percent of the total measurements recorded or the extent of measurements that can be accomplished in a normal 8-hour business day.

4. If rechecks yield measurements that differ from the measurements documented in the final report by more than the tolerances allowed, the measurements shall be noted as "FAILED."

5. If the number of "FAILED" measurements is greater than 10 percent of the total measurements checked during the final inspection, the testing and balancing shall be considered incomplete and shall be rejected.

C. TAB Work will be considered defective if it does not pass final inspections. If TAB Work fails, proceed as follows:

1. Recheck all measurements and make adjustments. Revise the final report and balancing device settings to include all changes; resubmit the final report and request a second final inspection.

2. If the second final inspection also fails, Owner may contract the services of another TAB contractor to complete TAB Work according to the Contract Documents and deduct the cost of the services from the original TAB contractor's final payment.

D. Prepare test and inspection reports.

3.12 ADDITIONAL TESTS

A. Within 90 days of completing TAB, perform additional TAB to verify that balanced conditions are being maintained throughout and to correct unusual conditions.

B. Seasonal Periods: If initial TAB procedures were not performed during near-peak summer and winter conditions, perform additional TAB during near-peak summer and winter conditions.

END OF SECTION

SECTION 23 07 13
DUCT INSULATION

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes insulating the following duct services:

1. Indoor, concealed supply and outdoor air.
2. Indoor, exposed supply and outdoor air.
3. Indoor, concealed return located in unconditioned space.
4. Indoor, exposed return located in unconditioned space.
5. Indoor, concealed oven and warewash exhaust.
6. Indoor, exposed oven and warewash exhaust.
7. Outdoor, concealed supply and return.
8. Outdoor, exposed supply and return.

B. Related Sections:

1. Section 233113 "Metal Ducts" for duct liners.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include thermal conductivity, water-vapor permeance thickness, and jackets (both factory- and field-applied if any).

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

1. Detail application of protective shields, saddles, and inserts at hangers for each type of insulation and hanger.
2. Detail insulation application at elbows, fittings, dampers, specialties and flanges for each type of insulation.
3. Detail application of field-applied jackets.
4. Detail application at linkages of control devices.

C. Samples: For each type of insulation and jacket indicated. Identify each Sample, describing product and intended use. Sample sizes are as follows:

1. Sheet Form Insulation Materials: 12 inches square.
2. Sheet Jacket Materials: 12 inches square.
3. Manufacturer's Color Charts: For products where color is specified, show the full range of colors available for each type of finished material.

1.03 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.

B. Material Test Reports: From a qualified testing agency acceptable to authorities having jurisdiction indicating, interpreting, and certifying test results for compliance of insulation materials, sealers, attachments, cements, and jackets, with requirements indicated. Include dates of tests and test methods employed.

C. Field quality-control reports.

1.04 QUALITY ASSURANCE

A. Installer Qualifications: Skilled mechanics who have successfully completed an apprenticeship program or another craft training program certified by the Department of Labor, Bureau of Apprenticeship and Training.

B. Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products according to ASTM E 84, by a testing agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing agency.

1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Packaging: Insulation material containers shall be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.

1.06 COORDINATION

A. Coordinate sizes and locations of supports, hangers, and insulation shields specified in Section 230529 "Hangers and Supports for HVAC Piping and Equipment."

B. Coordinate clearance requirements with duct Installer for duct insulation application. Before preparing ductwork Shop Drawings, establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.

C. Coordinate installation and testing of heat tracing.

1.07 SCHEDULING

A. Schedule insulation application after pressure testing systems and, where required, after installing and testing heat tracing. Insulation application may begin on segments that have satisfactory test results.

B. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

PART 2 - PRODUCTS

2.01 INSULATION MATERIALS

A. Comply with requirements in "Duct Insulation Schedule, General," "Indoor Duct and Plenum Insulation Schedule," and "Aboveground, Outdoor Duct and Plenum Insulation Schedule" articles for where insulating materials shall be applied.

B. Products shall not contain asbestos, lead, mercury, or mercury compounds.

C. Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871.

D. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.

E. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.

F. Mineral-Fiber Blanket Insulation: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 553, Type II and ASTM C 1290, Type III with factory-applied FSK jacket. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

1. Products: Subject to compliance with requirements, provide one of the following:

    a. CertainTeed Corp.; SoftTouch Duct Wrap.
    b. Johns Manville; Microlite.
    c. Knauf Insulation; Friendly Feel Duct Wrap.
    d. Owens Corning; SOFTR All-Service Duct Wrap.

G. Mineral-Fiber Board Insulation: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 612, Type IA or Type IB. For duct and plenum applications, provide insulation with factory-applied FSK jacket. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

1. Products: Subject to compliance with requirements, provide one of the following:

    a. CertainTeed Corp.; Commercial Board.

b. Fibrex Insulations Inc.; FBX.

c. Johns Manville; 800 Series Spin-Glas.

d. Knauf Insulation; Insulation Board.

e. Manson Insulation Inc.; AK Board.

f. Owens Corning; Fiberglas 700 Series.

H. Mineral-Fiber, Pipe and Tank Insulation: Mineral or glass fibers bonded with a thermosetting resin. Semirigid board material with factory-applied [FSK jacket] complying with ASTM C 1393, Type II or Type IIIA Category 2, or with properties similar to ASTM C 612, Type IB. Nominal density is 2.5 lb/cu. ft. or more. Thermal conductivity (k-value) at 100 deg F is 0.29 Btu x in./h x sq. ft. x deg F or less. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

1. Products: Subject to compliance with requirements, provide one of the following:

a. CertainTeed Corp.; CrimpWrap.

b. Johns Manville; MicroFlex.

c. Knauf Insulation; Pipe and Tank Insulation.

d. Manson Insulation Inc.; AK Flex.

e. Owens Corning; Fiberglas Pipe and Tank Insulation.

2.02 ADHESIVES

A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated unless otherwise indicated.

B. Mineral-Fiber Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-127.Eagle Bridges - Marathon Industries; 225.

b. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 85-60/85-70.Mon-Eco Industries, Inc.; 22-25.

2. For indoor applications, adhesive shall have a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

3. 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. ASJ Adhesive, and FSK Jacket Adhesive: Comply with MIL-A-3316C, Class 2, Grade A for bonding insulation jacket lap seams and joints.

1. Products: Subject to compliance with requirements, provide one of the following:

    a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-82.

    b. Eagle Bridges - Marathon Industries; 225.

    c. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 85-50.Mon-Eco Industries, Inc.; 22-25.

2. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

3. 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."

2.03 MASTICS

A. Materials shall be compatible with insulation materials, jackets, and substrates; comply with MIL-PRF-19565C, Type II.

1. For indoor applications, use mastics that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

B. Vapor-Barrier Mastic: Water based; suitable for indoor use on below ambient services.

1. Products: Subject to compliance with requirements, provide one of the following:

    a. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 30-80/30-90.

    b. Vimasco Corporation; 749.

2. Water-Vapor Permeance: ASTM E 96/E 96M, Procedure B, 0.013 perm at 43-mil dry film thickness.

3. Service Temperature Range: Minus 20 to plus 180 deg F.

4. Solids Content: ASTM D 1644, 58 percent by volume and 70 percent by weight.

5. Color: White.

C. Breather Mastic: Water based; suitable for indoor and outdoor use on above ambient services.

1. Products: Subject to compliance with requirements, provide one of the following:

    a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-10.

    b. Eagle Bridges - Marathon Industries; 550.

c. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 46-50.

d. Mon-Eco Industries, Inc.; 55-50.

e. Vimasco Corporation; WC-1/WC-5.

2. Water-Vapor Permeance: ASTM F 1249, 1.8 perms at 0.0625-inch dry film thickness.

3. Service Temperature Range: Minus 20 to plus 180 deg F.

4. Solids Content: 60 percent by volume and 66 percent by weight.

5. Color: White.

2.04 LAGGING ADHESIVES

A. Description: Comply with MIL-A-3316C, Class I, Grade A and shall be compatible with insulation materials, jackets, and substrates.

1. For indoor applications, use lagging adhesives that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2. Products: Subject to compliance with requirements, provide one of the following:

a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-50 AHV2.Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 30-36.

b. Vimasco Corporation; 713 and 714.

3. Fire-resistant, water-based lagging adhesive and coating for use indoors to adhere fire-resistant lagging cloths over duct insulation.

4. Service Temperature Range: 0 to plus 180 deg F.

5. Color: White.

2.05 SEALANTS

A. FSK and Metal Jacket Flashing Sealants:

1. Products: Subject to compliance with requirements, provide one of the following:

a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-76.Eagle Bridges - Marathon Industries; 405.

b. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 95-44.

c. Mon-Eco Industries, Inc.; 44-05.

2. Materials shall be compatible with insulation materials, jackets, and substrates.

3. Fire- and water-resistant, flexible, elastomeric sealant.

4. Service Temperature Range: Minus 40 to plus 250 deg F.
5. Color: Aluminum.
6. For indoor applications, sealants shall have a VOC content of 420 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
7. Sealants 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."

2.06 FACTORY-APPLIED JACKETS

A. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:

1. FSK Jacket: Aluminum-foil, fiberglass-reinforced scrim with kraft-paper backing; complying with ASTM C 1136, Type II.

2.07 FIELD-APPLIED JACKETS

A. Field-applied jackets shall comply with ASTM C 921, Type I, unless otherwise indicated.

B. FSK Jacket: Aluminum-foil-face, fiberglass-reinforced scrim with kraft-paper backing.

2.08 TAPES

A. FSK Tape: Foil-face, vapor-retarder tape matching factory-applied jacket with acrylic adhesive; complying with ASTM C 1136.

1. Products: Subject to compliance with requirements, provide one of the following:

a. ABI, Ideal Tape Division; 491 AWF FSK.
b. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0827.
c. Compac Corporation; 110 and 111.
d. Venture Tape; 1525 CW NT, 1528 CW, and 1528 CW/SQ.

2. Width: 3 inches.
3. Thickness: 6.5 mils.
4. Adhesion: 90 ounces force/inch in width.
5. Elongation: 2 percent.
6. Tensile Strength: 40 lbf/inch in width.
7. FSK Tape Disks and Squares: Precut disks or squares of FSK tape.

2.09 SECUREMENTS

A. Bands:

1. Products: Subject to compliance with requirements, provide one of the following:

    a. ITW Insulation Systems; Gerrard Strapping and Seals.

    b. RPR Products, Inc.; Insul-Mate Strapping, Seals, and Springs.

2. Stainless Steel: ASTM A 167 or ASTM A 240/A 240M, Type 304; 0.015-inch-thick, 1/2 inch wide with wing seal or closed seal.

3. Springs: Twin spring set constructed of stainless steel with ends flat and slotted to accept metal bands. Spring size determined by manufacturer for application.

B. Insulation Pins and Hangers:

1. Cupped-Head, Capacitor-Discharge-Weld Pins: Copper- or zinc-coated steel pin, fully annealed for capacitor-discharge welding, 0.135-inch-diameter shank, length to suit depth of insulation indicated with integral 1-1/2-inch galvanized carbon-steel washer.

    a. Products: Subject to compliance with requirements, provide one of the following:

        1) AGM Industries, Inc.; CHP-1.

        2) GEMCO; Cupped Head Weld Pin.

        3) Midwest Fasteners, Inc.; Cupped Head.

        4) Nelson Stud Welding; CHP.

2. Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch- thick, galvanized-steel sheet, with beveled edge sized as required to hold insulation securely in place but not less than 1-1/2 inches in diameter.

    a. Products: Subject to compliance with requirements, provide one of the following:

        1) AGM Industries, Inc.; RC-150.

        2) GEMCO; R-150.

        3) Midwest Fasteners, Inc.; WA-150.

        4) Nelson Stud Welding; Speed Clips.

    b. Protect ends with capped self-locking washers incorporating a spring steel insert to ensure permanent retention of cap in exposed locations.

3. Nonmetal Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch-thick nylon sheet, with beveled edge sized as required to hold insulation securely in place but not less than 1-1/2 inches in diameter.

    a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

        1) GEMCO.

2) Midwest Fasteners, Inc.

C. Staples: Outward-clinching insulation staples, nominal 3/4-inch- wide, stainless steel or Monel.

D. Wire: 0.062-inch soft-annealed, galvanized steel.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. C & F Wire.

2.10 CORNER ANGLES

A. Aluminum Corner Angles: 0.040 inch thick, minimum 1 by 1 inch, aluminum according to ASTM B 209, Alloy 3003, 3005, 3105, or 5005; Temper H-14.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of insulation application.

1. Verify that systems to be insulated have been tested and are free of defects.
2. Verify that surfaces to be insulated are clean and dry.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

3.03 GENERAL INSTALLATION REQUIREMENTS

A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of ducts and fittings.

B. Install insulation materials, vapor barriers or retarders, jackets, and thicknesses required for each item of duct system as specified in insulation system schedules.

C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.

D. Install insulation with longitudinal seams at top and bottom of horizontal runs.

E. Install multiple layers of insulation with longitudinal and end seams staggered.

F. Keep insulation materials dry during application and finishing.

G. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.

H. Install insulation with least number of joints practical.

I. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.

1. Install insulation continuously through hangers and around anchor attachments.
2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends at attachment to structure with vapor-barrier mastic.
3. Install insert materials and install insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.

J. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.

K. Install insulation with factory-applied jackets as follows:

1. Draw jacket tight and smooth.
2. Cover circumferential joints with 3-inch- wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip, spaced 4 inches o.c.
3. Overlap jacket longitudinal seams at least 1-1/2 inches. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 2 inches o.c.

    a. For below ambient services, apply vapor-barrier mastic over staples.

4. Cover joints and seams with tape, according to insulation material manufacturer's written instructions, to maintain vapor seal.
5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to duct flanges and fittings.

L. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.

M. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.

N. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.

3.04 PENETRATIONS

A. Insulation Installation at Roof Penetrations: Install insulation continuously through roof penetrations.

1. Seal penetrations with flashing sealant.
2. For applications requiring only indoor insulation, terminate insulation above roof surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
3. Extend jacket of outdoor insulation outside roof flashing at least 2 inches below top of roof flashing.
4. Seal jacket to roof flashing with flashing sealant.

B. Insulation Installation at Aboveground Exterior Wall Penetrations: Install insulation continuously through wall penetrations.

1. Seal penetrations with flashing sealant.
2. For applications requiring only indoor insulation, terminate insulation inside wall surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
3. Extend jacket of outdoor insulation outside wall flashing and overlap wall flashing at least 2 inches.
4. Seal jacket to wall flashing with flashing sealant.

C. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.

D. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Terminate insulation at fire damper sleeves for fire-rated wall and partition penetrations. Externally insulate damper sleeves to match adjacent insulation and overlap duct insulation at least 2 inches.

E. Insulation Installation at Floor Penetrations:

1. Duct: For penetrations through fire-rated assemblies, terminate insulation at fire damper sleeves and externally insulate damper sleeve beyond floor to match adjacent duct insulation. Overlap damper sleeve and duct insulation at least 2 inches.
2. Seal penetrations through fire-rated assemblies.

3.05 INSTALLATION OF MINERAL-FIBER INSULATION

A. Blanket Insulation Installation on Ducts and Plenums: Secure with adhesive and insulation pins.

1. Apply adhesives according to manufacturer's recommended coverage rates per unit area, for 100 percent coverage of duct and plenum surfaces.
2. Apply adhesive to entire circumference of ducts and to all surfaces of fittings and transitions.
3. Install either capacitor-discharge-weld pins and speed washers or cupped-head, capacitor-discharge-weld pins on sides and bottom of horizontal ducts and sides of vertical ducts as follows:

    a. On duct sides with dimensions 18 inches and smaller, place pins along longitudinal centerline of duct. Space 3 inches maximum from insulation end joints, and 16 inches o.c.

    b. On duct sides with dimensions larger than 18 inches, place pins 16 inches o.c. each way, and 3 inches maximum from insulation joints. Install additional pins to hold insulation tightly against surface at cross bracing.

    c. Pins may be omitted from top surface of horizontal, rectangular ducts and plenums.

    d. Do not overcompress insulation during installation.

    e. Impale insulation over pins and attach speed washers.

    f. Cut excess portion of pins extending beyond speed washers or bend parallel with insulation surface. Cover exposed pins and washers with tape matching insulation facing.

4. For ducts and plenums with surface temperatures below ambient, install a continuous unbroken vapor barrier. Create a facing lap for longitudinal seams and end joints with insulation by removing 2 inches from one edge and one end of insulation segment. Secure laps to adjacent insulation section with 1/2-inch outward-clinching staples, 1 inch o.c. Install vapor barrier consisting of factory- or field-applied jacket, adhesive, vapor-barrier mastic, and sealant at joints, seams, and protrusions.

    a. Repair punctures, tears, and penetrations with tape or mastic to maintain vapor-barrier seal.

    b. Install vapor stops for ductwork and plenums operating below 50 deg F at 18-foot intervals. Vapor stops shall consist of vapor-barrier mastic applied in a Z-shaped pattern over insulation face, along butt end of insulation, and over the surface. Cover insulation face and surface to be insulated a width equal to two times the insulation thickness, but not less than 3 inches.

5. Overlap unfaced blankets a minimum of 2 inches on longitudinal seams and end joints. At end joints, secure with steel bands spaced a maximum of 18 inches o.c.
6. Install insulation on rectangular duct elbows and transitions with a full insulation section for each surface. Install insulation on round and flat-oval duct elbows with individually mitered gores cut to fit the elbow.

7. Insulate duct stiffeners, hangers, and flanges that protrude beyond insulation surface with 6-inch- wide strips of same material used to insulate duct. Secure on alternating sides of stiffener, hanger, and flange with pins spaced 6 inches o.c.

B. Board Insulation Installation on Ducts and Plenums: Secure with adhesive and insulation pins.

1. Apply adhesives according to manufacturer's recommended coverage rates per unit area, for 100 percent coverage of duct and plenum surfaces.
2. Apply adhesive to entire circumference of ducts and to all surfaces of fittings and transitions.
3. Install either capacitor-discharge-weld pins and speed washers or cupped-head, capacitor-discharge-weld pins on sides and bottom of horizontal ducts and sides of vertical ducts as follows:

    a. On duct sides with dimensions 18 inches and smaller, place pins along longitudinal centerline of duct. Space 3 inches maximum from insulation end joints, and 16 inches o.c.

    b. On duct sides with dimensions larger than 18 inches, space pins 16 inches o.c. each way, and 3 inches maximum from insulation joints. Install additional pins to hold insulation tightly against surface at cross bracing.

    c. Pins may be omitted from top surface of horizontal, rectangular ducts and plenums.

    d. Do not overcompress insulation during installation.

    e. Cut excess portion of pins extending beyond speed washers or bend parallel with insulation surface. Cover exposed pins and washers with tape matching insulation facing.

4. For ducts and plenums with surface temperatures below ambient, install a continuous unbroken vapor barrier. Create a facing lap for longitudinal seams and end joints with insulation by removing 2 inches from one edge and one end of insulation segment. Secure laps to adjacent insulation section with 1/2-inch outward-clinching staples, 1 inch o.c. Install vapor barrier consisting of factory- or field-applied jacket, adhesive, vapor-barrier mastic, and sealant at joints, seams, and protrusions.

    a. Repair punctures, tears, and penetrations with tape or mastic to maintain vapor-barrier seal.

    b. Install vapor stops for ductwork and plenums operating below 50 deg F at 18-foot intervals. Vapor stops shall consist of vapor-barrier mastic applied in a Z-shaped pattern over insulation face, along butt end of insulation, and over the surface. Cover insulation face and surface to be insulated a width equal to two times the insulation thickness, but not less than 3 inches.

5. Install insulation on rectangular duct elbows and transitions with a full insulation section for each surface. Groove and score insulation to fit as closely as possible to outside and

inside radius of elbows. Install insulation on round and flat-oval duct elbows with individually mitered gores cut to fit the elbow.

6. Insulate duct stiffeners, hangers, and flanges that protrude beyond insulation surface with 6-inch- wide strips of same material used to insulate duct. Secure on alternating sides of stiffener, hanger, and flange with pins spaced 6 inches o.c.

3.06 FIELD-APPLIED JACKET INSTALLATION

A. Where FSK jackets are indicated, install as follows:

1. Draw jacket material smooth and tight.
2. Install lap or joint strips with same material as jacket.
3. Secure jacket to insulation with manufacturer's recommended adhesive.
4. Install jacket with 1-1/2-inch laps at longitudinal seams and 3-inch- wide joint strips at end joints.
5. Seal openings, punctures, and breaks in vapor-retarder jackets and exposed insulation with vapor-barrier mastic.

B. Where metal jackets are indicated, install with 2-inch overlap at longitudinal seams and end joints. Overlap longitudinal seams arranged to shed water. Seal end joints with weatherproof sealant recommended by insulation manufacturer. Secure jacket with stainless-steel bands 12 inches o.c. and at end joints.

3.07 FIRE-RATED INSULATION SYSTEM INSTALLATION

A. Where fire-rated insulation system is indicated, secure system to ducts and duct hangers and supports to maintain a continuous fire rating.

B. Insulate duct access panels and doors to achieve same fire rating as duct.

C. Install firestopping at penetrations through fire-rated assemblies.

3.08 FINISHES

A. Insulation with ASJ, Glass-Cloth, or Other Paintable Jacket Material: Paint jacket with paint system identified below and as specified in Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."

1. Flat Acrylic Finish: Two finish coats over a primer that is compatible with jacket material and finish coat paint. Add fungicidal agent to render fabric mildew proof.

a. Finish Coat Material: Interior, flat, latex-emulsion size.

B. Flexible Elastomeric Thermal Insulation: After adhesive has fully cured, apply two coats of insulation manufacturer's recommended protective coating.

C. Color: Final color as selected by Architect. Vary first and second coats to allow visual inspection of the completed Work.

D. Do not field paint aluminum or stainless-steel jackets.

3.09 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Perform tests and inspections.

C. Tests and Inspections:

1. Inspect ductwork, randomly selected by Architect, by removing field-applied jacket and insulation in layers in reverse order of their installation. Extent of inspection shall be limited to one location for each duct system defined in the "Duct Insulation Schedule, General" Article.

D. All insulation applications will be considered defective Work if sample inspection reveals noncompliance with requirements.

3.10 DUCT INSULATION SCHEDULE, GENERAL

A. Plenums and Ducts Requiring Insulation:

1. Indoor, concealed supply and outdoor air.
2. Indoor, exposed supply and outdoor air.
3. Indoor, concealed return located in unconditioned space.
4. Indoor, exposed return located in unconditioned space.
5. Indoor, concealed oven and warewash exhaust.
6. Indoor, exposed oven and warewash exhaust.
7. Outdoor, concealed supply and return.
8. Outdoor, exposed supply and return.

B. Items Not Insulated:

1. Fibrous-glass ducts.
2. Metal ducts with duct liner of sufficient thickness to comply with energy code and ASHRAE/IESNA 90.1.
3. Factory-insulated flexible ducts.
4. Factory-insulated plenums and casings.
5. Flexible connectors.
6. Vibration-control devices.
7. Factory-insulated access panels and doors.

3.11 INDOOR DUCT AND PLENUM INSULATION SCHEDULE

A. Concealed, supply-air duct and plenum insulation shall be one of the following:

1. Mineral-Fiber Blanket: 1-1/2 inches thick and 0.75-lb/cu. Ft. nominal density.
2. Mineral-Fiber Board: 1-1/2 inches thick and 3.0-lb/cu. Ft. nominal density.

B. Concealed, return-air duct and plenum insulation shall be one of the following:

1. Mineral-Fiber Blanket: 1-1/2 inches thick and 0.75-lb/cu. Ft. nominal density.
2. Mineral-Fiber Board: 1-1/2 inches thick and 3.0-lb/cu. Ft. nominal density.

C. Concealed, outdoor-air duct and plenum insulation shall be one of the following:

1. Mineral-Fiber Blanket: 1-1/2 inches thick and 0.75-lb/cu. Ft. nominal density.
2. Mineral-Fiber Board: 1-1/2 inches thick and 3.0-lb/cu. Ft. nominal density.

D. Exposed, supply-air duct and plenum insulation shall be the following:

1. Internally lined per Section 233113 “Metal Ducts.”

E. Exposed, return-air duct and plenum insulation shall be the following:

1. Internally lined per Section 233113 “Metal Ducts.”

F. Exposed, outdoor-air duct and plenum insulation shall be the following:

1. Internally lined per Section 233113 “Metal Ducts.”

3.12 ABOVEGROUND, OUTDOOR DUCT AND PLENUM INSULATION SCHEDULE

A. Insulation materials and thicknesses are identified below. If more than one material is listed for a duct system, selection from materials listed is Contractor's option.

B. Outdoor, supply-air duct and plenum insulation shall be the following:

1. Internally lined per Section 233113 “Metal Ducts.”

C. Outdoor, return-air duct and plenum insulation shall be the following:

1. Internally lined per Section 233113 “Metal Ducts.”

D. Outdoor, outdoor-air duct and plenum insulation shall be the following:

1. Internally lined per Section 233113 “Metal Ducts.”

END OF SECTION

SECTION 23 31 13
METAL DUCTS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Single-wall rectangular ducts and fittings.
2. Single-wall round ducts and fittings.
3. Sheet metal materials.
4. Duct liner.
5. Sealants and gaskets.
6. Hangers and supports.
7. Seismic-restraint devices.

B. Related Sections:

1. Section 230593 "Testing, Adjusting, and Balancing for HVAC" for testing, adjusting, and balancing requirements for metal ducts.
2. Section 233300 "Air Duct Accessories" for dampers, sound-control devices, duct-mounting access doors and panels, turning vanes, and flexible ducts.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of the following products:

1. Liners and adhesives.
2. Sealants and gaskets.
3. Seismic-restraint devices.

B. Shop Drawings:

1. Fabrication, assembly, and installation, including plans, elevations, sections, components, and attachments to other work.
2. Factory- and shop-fabricated ducts and fittings.
3. Duct layout indicating sizes, configuration, liner material, and static-pressure classes.
4. Elevation of top of ducts.

5. Dimensions of main duct runs from building grid lines.

6. Fittings.

7. Reinforcement and spacing.

8. Seam and joint construction.

9. Penetrations through fire-rated and other partitions.

10. Equipment installation based on equipment being used on Project.

11. Locations for duct accessories, including dampers, turning vanes, and access doors and panels.

12. Hangers and supports, including methods for duct and building attachment, seismic restraints, and vibration isolation.

1.03 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

1. Duct installation in congested spaces, indicating coordination with general construction, building components, and other building services. Indicate proposed changes to duct layout.

2. Suspended ceiling components.

3. Structural members to which duct will be attached.

4. Size and location of initial access modules for acoustical tile.

5. Penetrations of smoke barriers and fire-rated construction.

6. Items penetrating finished ceiling including the following:

    a. Lighting fixtures.
    b. Air outlets and inlets.
    c. Speakers.
    d. Sprinklers.
    e. Access panels.
    f. Perimeter moldings.

B. Welding certificates.

C. Field quality-control reports.

1.04 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel," for hangers and supports. AWS D9.1M/D9.1, "Sheet Metal Welding Code," for duct joint and seam welding.

B. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel," for hangers and supports.

2. AWS D9.1M/D9.1, "Sheet Metal Welding Code," for duct joint and seam welding.

C. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1, Section 5 - "Systems and Equipment" and Section 7 - "Construction and System Start-up."

D. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1, Section 6.4.4 - "HVAC System Construction and Insulation."

PART 2 - PRODUCTS

2.01 SINGLE-WALL RECTANGULAR DUCTS AND FITTINGS

A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" based on indicated static-pressure class unless otherwise indicated.

B. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-1, "Rectangular Duct/Transverse Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

C. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-2, "Rectangular Duct/Longitudinal Seams," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

D. Elbows, Transitions, Offsets, Branch Connections, and Other Duct Construction: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 4, "Fittings and Other Construction," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

2.02 SINGLE-WALL ROUND DUCTS AND FITTINGS

A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 3, "Round, Oval, and Flexible Duct," based on indicated static-pressure class unless otherwise indicated.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Lindab Inc.

b. McGill AirFlow LLC.

c. SEMCO Incorporated.

d. Sheet Metal Connectors, Inc.

e. Spiral Manufacturing Co., Inc.

B. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-1, "Round Duct Transverse Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

1. Transverse Joints in Ducts Larger Than 60 Inches in Diameter: Flanged.

C. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-2, "Round Duct Longitudinal Seams," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

1. Fabricate round ducts larger than 90 inches in diameter with butt-welded longitudinal seams.

D. Tees and Laterals: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-5, "90 Degree Tees and Laterals," and Figure 3-6, "Conical Tees," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

2.03 SHEET METAL MATERIALS

A. General Material Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.

B. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.

1. Galvanized Coating Designation: G90.

2. Finishes for Surfaces Exposed to View: Mill phosphatized.

C. Reinforcement Shapes and Plates: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.

1. Where black- and galvanized-steel shapes and plates are used to reinforce aluminum ducts, isolate the different metals with butyl rubber, neoprene, or EPDM gasket materials.

D. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

2.04 DUCT LINER

A. Fibrous-Glass Duct Liner: Comply with ASTM C 1071, NFPA 90A, or NFPA 90B; and with NAIMA AH124, "Fibrous Glass Duct Liner Standard."

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. CertainTeed Corporation; Insulation Group.

   b. Johns Manville.

   c. Knauf Insulation.

   d. Owens Corning.

2. Antimicrobial Erosion-Resistant Coating: Apply to the surface of the liner that will form the interior surface of the duct to act as a moisture repellent and erosion-resistant coating. Antimicrobial compound shall be tested for efficacy by an NRTL and registered by the EPA for use in HVAC systems.

3. Water-Based Liner Adhesive: Comply with NFPA 90A or NFPA 90B and with ASTM C 916.

   a. For indoor applications, adhesive shall have a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

   b. 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."

B. Insulation Pins and Washers:

1. Cupped-Head, Capacitor-Discharge-Weld Pins: Copper- or zinc-coated steel pin, fully annealed for capacitor-discharge welding, 0.106-inch-diameter shank, length to suit depth of insulation indicated with integral 1-1/2-inch galvanized carbon-steel washer.

2. Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch- thick galvanized steel; with beveled edge sized as required to hold insulation securely in place but not less than 1-1/2 inches in diameter.

C. Shop Application of Duct Liner: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 7-11, "Flexible Duct Liner Installation."

1. Adhere a single layer of indicated thickness of duct liner with at least 90 percent adhesive coverage at liner contact surface area. Attaining indicated thickness with multiple layers of duct liner is prohibited.

2. Apply adhesive to transverse edges of liner facing upstream that do not receive metal nosing.

3. Butt transverse joints without gaps, and coat joint with adhesive.

4. Fold and compress liner in corners of rectangular ducts or cut and fit to ensure butted-edge overlapping.

5. Do not apply liner in rectangular ducts with longitudinal joints, except at corners of ducts, unless duct size and dimensions of standard liner make longitudinal joints necessary.

6. Apply adhesive coating on longitudinal seams in ducts with air velocity of 2500 fpm.

7. Secure liner with mechanical fasteners 4 inches from corners and at intervals not exceeding 12 inches transversely; at 3 inches from transverse joints and at intervals not exceeding 18 inches longitudinally.

8. Secure transversely oriented liner edges facing the airstream with metal nosings that have either channel or "Z" profiles or are integrally formed from duct wall. Fabricate edge facings at the following locations:

    a. Fan discharges.

    b. Intervals of lined duct preceding unlined duct.

    c. Upstream edges of transverse joints in ducts where air velocities are higher than 2500 fpm or where indicated.

9. Secure insulation between perforated sheet metal inner duct of same thickness as specified for outer shell. Use mechanical fasteners that maintain inner duct at uniform distance from outer shell without compressing insulation.

    a. Sheet Metal Inner Duct Perforations: 3/32-inch diameter, with an overall open area of 23 percent.

10. Terminate inner ducts with buildouts attached to fire-damper sleeves, dampers, turning vane assemblies, or other devices. Fabricated buildouts (metal hat sections) or other buildout means are optional; when used, secure buildouts to duct walls with bolts, screws, rivets, or welds.

2.05 SEALANT AND GASKETS

A. General Sealant and Gasket Requirements: Surface-burning characteristics for sealants and gaskets shall be a maximum flame-spread index of 25 and a maximum smoke-developed index of 50 when tested according to UL 723; certified by an NRTL.

B. Two-Part Tape Sealing System:

1. Tape: Woven cotton fiber impregnated with mineral gypsum and modified acrylic/silicone activator to react exothermically with tape to form hard, durable, airtight seal.

2. Tape Width: 4 inches.

3. Sealant: Modified styrene acrylic.

4. Water resistant.

5. Mold and mildew resistant.

6. Maximum Static-Pressure Class: 10-inch wg, positive and negative.

7. Service: Indoor and outdoor.

8. Service Temperature: Minus 40 to plus 200 deg F.

9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum.

10. For indoor applications, sealant shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

11. 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."

C. Water-Based Joint and Seam Sealant:

1. Application Method: Brush on.

2. Solids Content: Minimum 65 percent.

3. Shore A Hardness: Minimum 20.

4. Water resistant.

5. Mold and mildew resistant.

6. VOC: Maximum 75 g/L (less water).

7. Maximum Static-Pressure Class: 10-inch wg, positive and negative.

8. Service: Indoor or outdoor.

9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum sheets.

D. Flanged Joint Sealant: Comply with ASTM C 920.

1. General: Single-component, acid-curing, silicone, elastomeric.

2. Type: S.

3. Grade: NS.

4. Class: 25.

5. Use: O.

6. For indoor applications, sealant shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

7. 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."

E. Flange Gaskets: Butyl rubber, neoprene, or EPDM polymer with polyisobutylene plasticizer.

F. Round Duct Joint O-Ring Seals:

1. Seal shall provide maximum leakage class of 3 cfm/100 sq. ft. at 1-inch wg and shall be rated for 10-inch wg static-pressure class, positive or negative.

2. EPDM O-ring to seal in concave bead in coupling or fitting spigot.

3. Double-lipped, EPDM O-ring seal, mechanically fastened to factory-fabricated couplings and fitting spigots.

2.06 HANGERS AND SUPPORTS

A. Hanger Rods for Noncorrosive Environments: Cadmium-plated steel rods and nuts.

B. Strap and Rod Sizes: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 5-1, "Rectangular Duct Hangers Minimum Size," and Table 5-2, "Minimum Hanger Sizes for Round Duct."

C. Steel Cables for Galvanized-Steel Ducts: Galvanized steel complying with ASTM A 603.

D. Steel Cable End Connections: Cadmium-plated steel assemblies with brackets, swivel, and bolts designed for duct hanger service; with an automatic-locking and clamping device.

E. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.

F. Trapeze and Riser Supports:

1. Supports for Galvanized-Steel Ducts: Galvanized-steel shapes and plates.

2.07 SEISMIC-RESTRAINT DEVICES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Cooper B-Line, Inc.; a division of Cooper Industries.

2. Ductmate Industries, Inc.

3. Hilti Corp.

4. Mason Industries.

5. TOLCO; a brand of NIBCO INC.

6. Unistrut Corporation; Tyco International, Ltd.

B. General Requirements for Restraint Components: Rated strengths, features, and applications shall be as defined in reports by the Office of Statewide Health Planning and Development for the State of California.

1. Structural Safety Factor: Allowable strength in tension, shear, and pullout force of components shall be at least four times the maximum seismic forces to which they will be subjected.

C. Channel Support System: Shop- or field-fabricated support assembly made of slotted steel channels rated in tension, compression, and torsion forces and with accessories for attachment to braced component at one end and to building structure at the other end. Include matching components and corrosion-resistant coating.

D. Restraint Cables: ASTM A 603, galvanized-steel cables with end connections made of cadmium-plated steel assemblies with brackets, swivel, and bolts designed for restraining cable service; and with an automatic-locking and clamping device or double-cable clips.

E. Hanger Rod Stiffener: Steel tube or steel slotted-support-system sleeve with internally bolted connections or Reinforcing steel angle clamped to hanger rod.

F. Mechanical Anchor Bolts: Drilled-in and stud-wedge or female-wedge type. Select anchor bolts with strength required for anchor and as tested according to ASTM E 488.

PART 3 - EXECUTION

3.01 DUCT INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of duct system. Indicated duct locations, configurations, and arrangements were used to size ducts and calculate friction loss for air-handling equipment sizing and for other design considerations. Install duct systems as indicated unless deviations to layout are approved on Shop Drawings and Coordination Drawings.

B. Install ducts according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" unless otherwise indicated.

C. Install round ducts in maximum practical lengths.

D. Install ducts with fewest possible joints.

E. Install factory- or shop-fabricated fittings for changes in direction, size, and shape and for branch connections.

F. Unless otherwise indicated, install ducts vertically and horizontally, and parallel and perpendicular to building lines.

G. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.

H. Install ducts with a clearance of 1 inch, plus allowance for insulation thickness.

I. Route ducts to avoid passing through transformer vaults and electrical equipment rooms and enclosures.

J. Where ducts pass through non-fire-rated interior partitions and exterior walls and are exposed to view, cover the opening between the partition and duct or duct insulation with sheet metal flanges of same metal thickness as the duct. Overlap openings on four sides by at least 1-1/2 inches.

K. Where ducts pass through fire-rated interior partitions and exterior walls, install fire dampers. Comply with requirements in Section 233300 "Air Duct Accessories" for fire and smoke dampers.

L. Protect duct interiors from moisture, construction debris and dust, and other foreign materials. Comply with SMACNA's "IAQ Guidelines for Occupied Buildings Under Construction," Appendix G, "Duct Cleanliness for New Construction Guidelines."

3.02 INSTALLATION OF EXPOSED DUCTWORK

A. Protect ducts exposed in finished spaces from being dented, scratched, or damaged.

B. Trim duct sealants flush with metal. Create a smooth and uniform exposed bead. Do not use two-part tape sealing system.

C. Grind welds to provide smooth surface free of burrs, sharp edges, and weld splatter. When welding stainless steel with a No. 3 or 4 finish, grind the welds flush, polish the exposed welds, and treat the welds to remove discoloration caused by welding.

D. Maintain consistency, symmetry, and uniformity in the arrangement and fabrication of fittings, hangers and supports, duct accessories, and air outlets.

E. Repair or replace damaged sections and finished work that does not comply with these requirements.

3.03 DUCT SEALING

A. Seal ducts for duct static-pressure, seal classes, and leakage classes specified in "Duct Schedule" Article according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

B. Seal ducts to the following seal classes according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible":

1. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
2. Outdoor, Supply-Air Ducts: Seal Class A.
3. Outdoor, Exhaust Ducts: Seal Class C.
4. Outdoor, Return-Air Ducts: Seal Class C.
5. Unconditioned Space, Supply-Air Ducts in Pressure Classes 2-Inch wg and Lower: Seal Class B.
6. Unconditioned Space, Supply-Air Ducts in Pressure Classes Higher Than 2-Inch wg: Seal Class A.

7. Unconditioned Space, Exhaust Ducts: Seal Class C.

8. Unconditioned Space, Return-Air Ducts: Seal Class B.

9. Conditioned Space, Supply-Air Ducts in Pressure Classes 2-Inch wg and Lower: Seal Class C.

10. Conditioned Space, Supply-Air Ducts in Pressure Classes Higher Than 2-Inch wg: Seal Class B.

11. Conditioned Space, Exhaust Ducts: Seal Class B.

12. Conditioned Space, Return-Air Ducts: Seal Class C.

3.04 HANGER AND SUPPORT INSTALLATION

A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 5, "Hangers and Supports."

B. Building Attachments: Concrete inserts, powder-actuated fasteners, or structural-steel fasteners appropriate for construction materials to which hangers are being attached.

1. Where practical, install concrete inserts before placing concrete.

2. Install powder-actuated concrete fasteners after concrete is placed and completely cured.

3. Use powder-actuated concrete fasteners for standard-weight aggregate concretes or for slabs more than 4 inches thick.

4. Do not use powder-actuated concrete fasteners for lightweight-aggregate concretes or for slabs less than 4 inches thick.

5. Do not use powder-actuated concrete fasteners for seismic restraints.

C. Hanger Spacing: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 5-1, "Rectangular Duct Hangers Minimum Size," and Table 5-2, "Minimum Hanger Sizes for Round Duct," for maximum hanger spacing; install hangers and supports within 24 inches of each elbow and within 48 inches of each branch intersection.

D. Hangers Exposed to View: Threaded rod and angle or channel supports.

E. Support vertical ducts with steel angles or channel secured to the sides of the duct with welds, bolts, sheet metal screws, or blind rivets; support at each floor and at a maximum intervals of 16 feet.

F. Install upper attachments to structures. Select and size upper attachments with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

3.05 SEISMIC-RESTRAINT-DEVICE INSTALLATION

A. Install ducts with hangers and braces designed to support the duct and to restrain against seismic forces required by applicable building codes. Comply with ASCE/SEI 7.

1. Space lateral supports a maximum of 40 feet o.c., and longitudinal supports a maximum of 80 feet o.c.

2. Brace a change of direction longer than 12 feet.

B. Select seismic-restraint devices with capacities adequate to carry present and future static and seismic loads.

C. Install cables so they do not bend across edges of adjacent equipment or building structure.

D. Install cable restraints on ducts that are suspended with vibration isolators.

E. Install seismic-restraint devices using methods approved by the Office of Statewide Health Planning and Development for the State of California.

F. Attachment to Structure: If specific attachment is not indicated, anchor bracing and restraints to structure, to flanges of beams, to upper truss chords of bar joists, or to concrete members.

G. Drilling for and Setting Anchors:

1. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not damage existing reinforcement or embedded items during drilling. Notify the Architect if reinforcing steel or other embedded items are encountered during drilling. Locate and avoid prestressed tendons, electrical and telecommunications conduit, and gas lines.

2. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.

3. Wedge Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in the structural element to which anchor is to be fastened.

4. Set anchors to manufacturer's recommended torque, using a torque wrench.

5. Install zinc-coated steel anchors for interior applications and stainless-steel anchors for applications exposed to weather.

3.06 CONNECTIONS

A. Make connections to equipment with flexible connectors complying with Section 233300 "Air Duct Accessories."

B. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for branch, outlet and inlet, and terminal unit connections.

3.07 PAINTING

A. Paint interior of metal ducts that are visible through registers and grilles and that do not have duct liner. Apply one coat of flat, black, latex paint over a compatible galvanized-steel primer. Paint materials and application requirements are specified in Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."

3.08 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Leakage Tests:

1. Comply with SMACNA's "HVAC Air Duct Leakage Test Manual." Submit a test report for each test.

2. Test the following systems:

   a. Ducts with a Pressure Class Higher Than 3-Inch wg: Test representative duct sections totaling no less than 25 percent of total installed duct area for each designated pressure class.

   b. Supply, Return, Outdoor Air, Exhaust Ducts with a Pressure Class of 2-Inch wg or Higher: Test representative duct sections totaling no less than 100 percent of total installed duct area for each designated pressure class.

3. Disassemble, reassemble, and seal segments of systems to accommodate leakage testing and for compliance with test requirements.

4. Test for leaks before applying external insulation.

5. Conduct tests at static pressures equal to maximum design pressure of system or section being tested. If static-pressure classes are not indicated, test system at maximum system design pressure. Do not pressurize systems above maximum design operating pressure.

6. Give seven days' advance notice for testing.

C. Duct System Cleanliness Tests:

1. Visually inspect duct system to ensure that no visible contaminants are present.

2. Test sections of metal duct system, chosen randomly by Owner, for cleanliness according to "Vacuum Test" in NADCA ACR, "Assessment, Cleaning and Restoration of HVAC Systems."

   a. Acceptable Cleanliness Level: Net weight of debris collected on the filter media shall not exceed 0.75 mg/100 sq. cm.

D. Duct system will be considered defective if it does not pass tests and inspections.

E. Prepare test and inspection reports.

3.09 DUCT CLEANING

A. Clean new and existing duct system(s) before testing, adjusting, and balancing.

B. Use service openings for entry and inspection.

1. Create new openings and install access panels appropriate for duct static-pressure class if required for cleaning access. Provide insulated panels for insulated or lined duct. Patch insulation and liner as recommended by duct liner manufacturer. Comply with Section 233300 "Air Duct Accessories" for access panels and doors.

2. Disconnect and reconnect flexible ducts as needed for cleaning and inspection.

3. Remove and reinstall ceiling to gain access during the cleaning process.

C. Particulate Collection and Odor Control:

1. When venting vacuuming system inside the building, use HEPA filtration with 99.97 percent collection efficiency for 0.3-micron-size (or larger) particles.

2. When venting vacuuming system to outdoors, use filter to collect debris removed from HVAC system, and locate exhaust downwind and away from air intakes and other points of entry into building.

D. Clean the following components by removing surface contaminants and deposits:

1. Air outlets and inlets (registers, grilles, and diffusers).

2. Supply, return, and exhaust fans including fan housings, plenums (except ceiling supply and return plenums), scrolls, blades or vanes, shafts, baffles, dampers, and drive assemblies.

3. Air-handling unit internal surfaces and components including mixing box, coil section, air wash systems, spray eliminators, condensate drain pans, humidifiers and dehumidifiers, filters and filter sections, and condensate collectors and drains.

4. Coils and related components.

5. Return-air ducts, dampers, actuators, and turning vanes except in ceiling plenums and mechanical equipment rooms.

6. Supply-air ducts, dampers, actuators, and turning vanes.

7. Dedicated exhaust and ventilation components and makeup air systems.

E. Mechanical Cleaning Methodology:

1. Clean metal duct systems using mechanical cleaning methods that extract contaminants from within duct systems and remove contaminants from building.

2. Use vacuum-collection devices that are operated continuously during cleaning. Connect vacuum device to downstream end of duct sections so areas being cleaned are under negative pressure.

3. Use mechanical agitation to dislodge debris adhered to interior duct surfaces without damaging integrity of metal ducts, duct liner, or duct accessories.

4. Clean fibrous-glass duct liner with HEPA vacuuming equipment; do not permit duct liner to get wet. Replace fibrous-glass duct liner that is damaged, deteriorated, or delaminated or that has friable material, mold, or fungus growth.

5. Clean coils and coil drain pans according to NADCA 1992. Keep drain pan operational. Rinse coils with clean water to remove latent residues and cleaning materials; comb and straighten fins.

6. Provide drainage and cleanup for wash-down procedures.

7. Antimicrobial Agents and Coatings: Apply EPA-registered antimicrobial agents if fungus is present. Apply antimicrobial agents according to manufacturer's written instructions after removal of surface deposits and debris.

3.10 START UP

A. Air Balance: Comply with requirements in Section 230593 "Testing, Adjusting, and Balancing for HVAC."

3.11 DUCT SCHEDULE

A. Fabricate ducts with galvanized sheet steel except as otherwise indicated.

B. Supply Ducts:

1. Ducts Connected to Fan Coil Units, Furnaces, Heat Pumps, and Terminal Units

   a. Pressure Class: Positive 2-inch wg.
   b. Minimum SMACNA Seal Class: C.
   c. SMACNA Leakage Class for Rectangular: 24.
   d. SMACNA Leakage Class for Round and Flat Oval: 12.

2. Ducts Connected to Air-Handling Units:

   a. Pressure Class: Positive 2-inch wg.
   b. Minimum SMACNA Seal Class: C.
   c. SMACNA Leakage Class for Rectangular: 24.
   d. SMACNA Leakage Class for Round and Flat Oval: 12.

3. Ducts Connected to Equipment Not Listed Above:

a. Pressure Class: Positive 2-inch wg.
b. Minimum SMACNA Seal Class: C.
c. SMACNA Leakage Class for Rectangular: 24.
d. SMACNA Leakage Class for Round and Flat Oval: 12.

C. Return Ducts:

1. Ducts Connected to Fan Coil Units, Furnaces, Heat Pumps, and Terminal Units:

a. Pressure Class: Positive or negative 2-inch wg.
b. Minimum SMACNA Seal Class: C.
c. SMACNA Leakage Class for Rectangular: 24.
d. SMACNA Leakage Class for Round and Flat Oval: 12.

2. Ducts Connected to Air-Handling Units:

a. Pressure Class: Positive or negative 2-inch wg.
b. Minimum SMACNA Seal Class: C.
c. SMACNA Leakage Class for Rectangular: 24.
d. SMACNA Leakage Class for Round and Flat Oval: 12

3. Ducts Connected to Equipment Not Listed Above:

a. Pressure Class: Positive or negative 2-inch wg.
b. Minimum SMACNA Seal Class: C.
c. SMACNA Leakage Class for Rectangular: 24.
d. SMACNA Leakage Class for Round and Flat Oval: 12

D. Exhaust Ducts:

1. Ducts Connected to Fans Exhausting (ASHRAE 62.1, Class 1 and 2) Air:

a. Pressure Class: Negative 2-inch wg.
b. Minimum SMACNA Seal Class: C.
c. SMACNA Leakage Class for Rectangular: 24.
d. SMACNA Leakage Class for Round and Flat Oval: 12

2. Ducts Connected to Air-Handling Units:

a. Pressure Class: Positive or negative 2-inch wg.
b. Minimum SMACNA Seal Class: C.
c. SMACNA Leakage Class for Rectangular: 24.
d. SMACNA Leakage Class for Round and Flat Oval: 12

3. Ducts Connected to Commercial Kitchen Hoods: Comply with NFPA 96.

    a. Exposed to View: Type 304, stainless-steel sheet, No. 4 finish.
    b. Concealed: Type 304, stainless-steel sheet, No. 2D finish.
    c. Welded seams and joints.
    d. Pressure Class: Positive or negative 2-inch wg.
    e. Minimum SMACNA Seal Class: Welded seams, joints, and penetrations.
    f. SMACNA Leakage Class: 3.

4. Ducts Connected to Dishwasher Hoods:

    a. Type 304, stainless-steel sheet.
    b. Exposed to View: No. 4 finish.
    c. Concealed: No. 2D finish.
    d. Welded seams and flanged joints with watertight EPDM gaskets.
    e. Pressure Class: Positive or negative 2-inch wg.
    f. SMACNA Leakage Class: 3.

5. Ducts Connected to Fans Exhausting Laboratory and Process (ASHRAE 62.1, Class 3 and 4) Air:

    a. Type 316, stainless-steel sheet.

        1) Exposed to View: No. 4 finish.
        2) Concealed: No. 2D finish.

    b. Pressure Class: Positive or negative 2-inch wg.
    c. Minimum SMACNA Seal Class: Welded seams, joints, and penetrations.
    d. SMACNA Leakage Class: 3.

6. Ducts Connected to Equipment Not Listed Above:

    a. Pressure Class: Positive or negative 2-inch wg.
    b. Minimum SMACNA Seal Class: C.
    c. SMACNA Leakage Class for Rectangular: 24.
    d. SMACNA Leakage Class for Round and Flat Oval: 12

E. Outdoor-Air (Not Filtered, Heated, or Cooled) Ducts:

1. Ducts Connected to Fan Coil Units, Furnaces, Heat Pumps, and Terminal Units:

    a. Pressure Class: Positive or negative 2-inch wg.

b. Minimum SMACNA Seal Class: C.

c. SMACNA Leakage Class for Rectangular: 24.

d. SMACNA Leakage Class for Round and Flat Oval: 12

2. Ducts Connected to Air-Handling Units:

a. Pressure Class: Positive or negative 2-inch wg.

b. Minimum SMACNA Seal Class: C.

c. SMACNA Leakage Class for Rectangular: 24.

d. SMACNA Leakage Class for Round and Flat Oval: 12

3. Ducts Connected to Equipment Not Listed Above:

a. Pressure Class: Positive or negative 2-inch wg.

b. Minimum SMACNA Seal Class: C.

c. SMACNA Leakage Class for Rectangular: 24.

d. SMACNA Leakage Class for Round and Flat Oval: 12

F. Intermediate Reinforcement:

1. Galvanized-Steel Ducts: Galvanized steel.

G. Liner:

1. Supply and Return Air Ducts and Plenums: Fibrous glass, Type I, 1-1/2 inches thick.

2. Transfer Ducts: Fibrous glass, Type I, 2 inches thick.

H. Elbow Configuration:

1. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-2, "Rectangular Elbows."

a. Velocity 1000 fpm or Lower:

1) Radius Type RE 1 with minimum 0.5 radius-to-diameter ratio.

2) Mitered Type RE 4 without vanes.

b. Velocity 1000 to 1500 fpm:

1) Radius Type RE 1 with minimum 1.0 radius-to-diameter ratio.

2) Radius Type RE 3 with minimum 0.5 radius-to-diameter ratio and two vanes.

3) Mitered Type RE 2 with vanes complying with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-3, "Vanes and Vane Runners," and Figure 4-4, "Vane Support in Elbows."

c. Velocity 1500 fpm or Higher:

1) Radius Type RE 1 with minimum 1.5 radius-to-diameter ratio.

2) Radius Type RE 3 with minimum 1.0 radius-to-diameter ratio and two vanes.

3) Mitered Type RE 2 with vanes complying with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-3, "Vanes and Vane Runners," and Figure 4-4, "Vane Support in Elbows."

2. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-2, "Rectangular Elbows."

a. Radius Type RE 1 with minimum 1.5 radius-to-diameter ratio.

b. Radius Type RE 3 with minimum 1.0 radius-to-diameter ratio and two vanes.

c. Mitered Type RE 2 with vanes complying with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-3, "Vanes and Vane Runners," and Figure 4-4, "Vane Support in Elbows."

3. Round Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-4, "Round Duct Elbows."

a. Minimum Radius-to-Diameter Ratio and Elbow Segments: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 3-1, "Mitered Elbows." Elbows with less than 90-degree change of direction have proportionately fewer segments.

1) Velocity 1000 fpm or Lower: 0.5 radius-to-diameter ratio and three segments for 90-degree elbow.

2) Velocity 1000 to 1500 fpm: 1.0 radius-to-diameter ratio and four segments for 90-degree elbow.

3) Velocity 1500 fpm or Higher: 1.5 radius-to-diameter ratio and five segments for 90-degree elbow.

4) Radius-to Diameter Ratio: 1.5.

b. Round Elbows, 12 Inches and Smaller in Diameter: Stamped or pleated.

c. Round Elbows, 14 Inches and Larger in Diameter: Standing seam.

I. Branch Configuration:

1. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-6, "Branch Connection."

a. Rectangular Main to Rectangular Branch: 45-degree entry.

b. Rectangular Main to Round Branch: Spin in.

2. Round and Flat Oval: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-5, "90 Degree Tees and Laterals," and Figure 3-6, "Conical Tees." Saddle taps are permitted in existing duct.

    a. Velocity 1000 fpm or Lower: 90-degree tap.

    b. Velocity 1000 to 1500 fpm: Conical tap.

    c. Velocity 1500 fpm or Higher: 45-degree lateral.

END OF SECTION

SECTION 23 33 00
AIR DUCT ACCESSORIES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Backdraft and pressure relief dampers.
2. Barometric relief dampers.
3. Manual volume dampers.
4. Combination fire and smoke dampers.
5. Flange connectors.
6. Turning vanes.
7. Remote damper operators.
8. Duct-mounted access doors.
9. Flexible connectors.
10. Flexible ducts.
11. Duct accessory hardware.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. For duct silencers, include pressure drop and dynamic insertion loss data. Include breakout noise calculations for high transmission loss casings.

B. Shop Drawings: For duct accessories. Include plans, elevations, sections, details and attachments to other work.

1. Detail duct accessories fabrication and installation in ducts and other construction. Include dimensions, weights, loads, and required clearances; and method of field assembly into duct systems and other construction. Include the following:

a. Special fittings.
b. Manual volume damper installations.
c. Control-damper installations.
d. Fire-damper, smoke-damper, combination fire- and smoke-damper, ceiling, and corridor damper installations, including sleeves; and duct-mounted access doors and remote damper operators.
e. Duct security bars.
f. Wiring Diagrams: For power, signal, and control wiring.

1.03 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which ceiling-mounted access panels and access doors required for access to duct accessories are shown and coordinated with each other, using input from Installers of the items involved.

B. Source quality-control reports.

1.04 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For air duct accessories to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.01 ASSEMBLY DESCRIPTION

A. Comply with NFPA 90A, "Installation of Air Conditioning and Ventilating Systems," and with NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."

B. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.

2.02 MATERIALS

A. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.

1. Galvanized Coating Designation: G90.
2. Exposed-Surface Finish: Mill phosphatized.

B. Stainless-Steel Sheets: Comply with ASTM A 480/A 480M, Type 304, and having a No. 2 finish for concealed ducts and finish for exposed ducts.

C. Reinforcement Shapes and Plates: Galvanized-steel reinforcement where installed on galvanized sheet metal ducts; compatible materials for aluminum and stainless-steel ducts.

D. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

2.03 BACKDRAFT AND PRESSURE RELIEF DAMPERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Greenheck Fan Corporation.
2. Pottorff.

3. Ruskin Company.

B. Description: Gravity balanced.

C. Maximum Air Velocity: 2500 fpm.

D. Maximum System Pressure: 2-inch wg.

E. Frame: Hat-shaped, 18-gage galvanized sheet steel, with welded corners or mechanically attached and mounting flange.

F. Blades: Multiple single-piece blades, center pivoted, maximum 6-inch width, 0.025-inch- thick, roll-formed aluminum with sealed edges.

G. Blade Action: Parallel.

H. Blade Seals: Extruded vinyl, mechanically locked.

I. Blade Axles:
   1. Material: Plated steel.
   2. Diameter: 0.20 inch.

J. Tie Bars and Brackets: Galvanized steel.

K. Return Spring: Adjustable tension.

L. Bearings: Synthetic pivot bushings.

M. Accessories:
   1. Adjustment device to permit setting for varying differential static pressure.
   2. Counterweights and spring-assist kits for vertical airflow installations.
   3. Chain pulls.
   4. Screen Mounting: Front mounted in sleeve.
      a. Sleeve Thickness: 20 gage minimum.
      b. Sleeve Length: 6 inches minimum.
   5. Screen Mounting: Rear mounted.
   6. Screen Material: Galvanized steel.
   7. Screen Type: Bird.
   8. 90-degree stops.

2.04 BAROMETRIC RELIEF DAMPERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Greenheck Fan Corporation.
2. Pottorff.
3. Ruskin Company.

B. Suitable for horizontal or vertical mounting.

C. Maximum Air Velocity: 2000 fpm.

D. Maximum System Pressure: 2-inch wg.

E. Frame: Hat-shaped, 16-gage, galvanized sheet steel with welded corners or mechanically attached and mounting flange.

F. Blades:
1. Multiple, 0.025-inch- thick, roll-formed alumrinum.
2. Maximum Width: 6 inches.
3. Action: Parallel.
4. Balance: Gravity.
5. Eccentrically pivoted.

G. Blade Seals: Vinyl.

H. Blade Axles: Plated steel.

I. Tie Bars and Brackets:
1. Material: Galvanized steel.
2. Rattle free with 90-degree stop.

J. Return Spring: Adjustable tension.

K. Bearings: Ball.

L. Accessories:
1. Flange on intake.
2. Adjustment device to permit setting for varying differential static pressures.

2.05 MANUAL VOLUME DAMPERS

A. Standard, Steel, Manual Volume Dampers:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Nailor Industries Inc.
b. Pottorff.

c. Ruskin Company.
d. Trox USA Inc.

2. Standard leakage rating.
3. Suitable for horizontal or vertical applications.
4. Frames:
    a. Frame: Hat-shaped, 20-gage, galvanized sheet steel.
    b. Mitered and welded corners.
    c. Flanges for attaching to walls and flangeless frames for installing in ducts.
5. Blades:
    a. Multiple or single blade.
    b. Parallel- or opposed-blade design.
    c. Stiffen damper blades for stability.
    d. Galvanized-steel, 0.064 inch thick.
6. Blade Axles: Plated steel.
7. Bearings:
    a. Molded synthetic.
    b. Dampers in ducts with pressure classes of 3-inch wg or less shall have axles full length of damper blades and bearings at both ends of operating shaft.
8. Tie Bars and Brackets: Galvanized steel.

2.06 COMBINATION FIRE AND SMOKE DAMPERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    1. Greenheck Fan Corporation.
    2. Pottorff.
    3. Ruskin Company.

B. Type: Dynamic; rated and labeled according to UL 555 and UL 555S by an NRTL.

C. Closing rating in ducts up to 4-inch wg static pressure class and minimum 2000-fpm velocity.

D. Fire Rating: 1-1/2 and 3 hours.

E. Frame: Hat-shaped, 0.094-inch- thick, galvanized sheet steel, with welded or mechanically attached corners and mounting flange.

F. Heat-Responsive Device: Electric resettable device and switch package, factory installed, rated.

G. Smoke Detector: Integral, factory wired for single-point connection.

H. Blades: Roll-formed, horizontal, interlocking, 16-gage, galvanized sheet steel.

I. Leakage: Class II.

J. Rated pressure and velocity to exceed design airflow conditions.

K. Mounting Sleeve: Factory-installed, 0.039-inch-thick, galvanized sheet steel; length to suit wall or floor application with factory-furnished silicone calking.

L. Master control panel for use in dynamic smoke-management systems.

M. Damper Motors: Two-position action.

2.07 FLANGE CONNECTORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Ductmate Industries, Inc.
2. Nexus PDQ; Division of Shilco Holdings Inc.
3. Ward Industries, Inc.; a division of Hart & Cooley, Inc.

B. Description: Roll-formed, factory-fabricated, slide-on transverse flange connectors, gaskets, and components.

C. Material: Galvanized steel.

D. Gage and Shape: Match connecting ductwork.

2.08 TURNING VANES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Ductmate Industries, Inc.
2. Duro Dyne Inc.
3. METALAIRE, Inc.
4. SEMCO Incorporated.

B. Manufactured Turning Vanes for Metal Ducts: Curved blades of galvanized sheet steel; support with bars perpendicular to blades set; set into vane runners suitable for duct mounting.

1. Acoustic Turning Vanes: Fabricate airfoil-shaped aluminum extrusions with perforated faces and fibrous-glass fill.

C. Manufactured Turning Vanes for Nonmetal Ducts: Fabricate curved blades of resin-bonded fiberglass with acrylic polymer coating; support with bars perpendicular to blades set; set into vane runners suitable for duct mounting.

D. General Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible"; Figures 4-3, "Vanes and Vane Runners," and 4-4, "Vane Support in Elbows."

E. Vane Construction: Double wall.

2.09 REMOTE DAMPER OPERATORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Pottorff.
2. Ventfabrics, Inc.
3. Young Regulator Company.

B. Description: Cable system designed for remote manual damper adjustment.

C. Tubing: Galvanized spiral wire sheath.

D. Cable: Stainless steel.

E. Wall-Box Mounting: Recessed.

F. Wall-Box Cover-Plate Material: Steel.

2.10 DUCT-MOUNTED ACCESS DOORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Ductmate Industries, Inc.
2. Greenheck Fan Corporation.
3. Pottorff.

B. Duct-Mounted Access Doors: Fabricate access panels according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible"; Figures 7-2, "Duct Access Doors and Panels," and 7-3, "Access Doors - Round Duct."

1. Door:

a. Double wall, rectangular.
b. Galvanized sheet metal with insulation fill and thickness as indicated for duct pressure class.
c. Vision panel.
d. Hinges and Latches: 1-by-1-inch butt or piano hinge and cam latches.

e. Fabricate doors airtight and suitable for duct pressure class.

2. Frame: Galvanized sheet steel, with bend-over tabs and foam gaskets.

3. Number of Hinges and Locks:

a. Access Doors Less Than 12 Inches Square: No hinges and two sash locks.

b. Access Doors up to 18 Inches Square: Continuous and two sash locks.

c. Access Doors up to 24 by 48 Inches: Continuous and two compression latches with outside and inside handles.

d. Access Doors Larger Than 24 by 48 Inches: Continuous and two compression latches with outside and inside handles.

C. Pressure Relief Access Door:

1. Door and Frame Material: Galvanized sheet steel.

2. Door: Single wall or double wall with insulation fill with metal thickness applicable for duct pressure class.

3. Operation: Open outward for positive-pressure ducts and inward for negative-pressure ducts.

4. Factory set.

5. Doors close when pressures are within set-point range.

6. Hinge: Continuous piano.

7. Latches: Cam.

8. Seal: Neoprene or foam rubber.

9. Insulation Fill: 1-inch- thick, fibrous-glass or polystyrene-foam board.

2.11 DUCT ACCESS PANEL ASSEMBLIES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Ductmate Industries, Inc.

2. Flame Gard, Inc.

3. 3M.

B. Labeled according to UL 1978 by an NRTL.

C. Panel and Frame: Minimum thickness 11-gage carbon steel.

D. Fasteners: Carbon steel. Panel fasteners shall not penetrate duct wall.

E. Gasket: Comply with NFPA 96; grease-tight, high-temperature ceramic fiber, rated for minimum 2000 deg F.

F. Minimum Pressure Rating: 10-inch wg, positive or negative.

2.12 FLEXIBLE CONNECTORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Ductmate Industries, Inc.
2. Duro Dyne Inc.
3. Ward Industries, Inc.; a division of Hart & Cooley, Inc.

B. Materials: Flame-retardant or noncombustible fabrics.

C. Coatings and Adhesives: Comply with UL 181, Class 1.

D. Metal-Edged Connectors: Factory fabricated with a fabric strip 3-1/2 inches wide attached to two strips of 2-3/4-inch- wide, 0.028-inch- thick, galvanized sheet steel or 0.032-inch- thick aluminum sheets. Provide metal compatible with connected ducts.

E. Indoor System, Flexible Connector Fabric: Glass fabric double coated with neoprene.

1. Minimum Weight: 26 oz./sq. yd..
2. Tensile Strength: 480 lbf/inch in the warp and 360 lbf/inch in the filling.
3. Service Temperature: Minus 40 to plus 200 deg F.

F. Outdoor System, Flexible Connector Fabric: Glass fabric double coated with weatherproof, synthetic rubber resistant to UV rays and ozone.

1. Minimum Weight: 24 oz./sq. yd..
2. Tensile Strength: 530 lbf/inch in the warp and 440 lbf/inch in the filling.
3. Service Temperature: Minus 50 to plus 250 deg F.

G. High-Temperature System, Flexible Connectors: Glass fabric coated with silicone rubber.

1. Minimum Weight: 16 oz./sq. yd..
2. Tensile Strength: 285 lbf/inch in the warp and 185 lbf/inch in the filling.
3. Service Temperature: Minus 67 to plus 500 deg F.

H. High-Corrosive-Environment System, Flexible Connectors: Glass fabric with chemical-resistant coating.

1. Minimum Weight: 14 oz./sq. yd..
2. Tensile Strength: 450 lbf/inch in the warp and 340 lbf/inch in the filling.
3. Service Temperature: Minus 67 to plus 500 deg F.

I. Thrust Limits: Combination coil spring and elastomeric insert with spring and insert in compression, and with a load stop. Include rod and angle-iron brackets for attaching to fan discharge and duct.

1. Frame: Steel, fabricated for connection to threaded rods and to allow for a maximum of 30 degrees of angular rod misalignment without binding or reducing isolation efficiency.

2. Outdoor Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
3. Minimum Additional Travel: 50 percent of the required deflection at rated load.
4. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
5. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
6. Elastomeric Element: Molded, oil-resistant rubber or neoprene.
7. Coil Spring: Factory set and field adjustable for a maximum of 1/4-inch movement at start and stop.

2.13 FLEXIBLE DUCTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Flexmaster U.S.A., Inc.
2. McGill AirFlow LLC.
3. Ward Industries, Inc.; a division of Hart & Cooley, Inc.

B. Insulated, Flexible Duct: UL 181, Class 1, polyethylene film supported by helically wound, galvanized-steel wire; fibrous-glass insulation; aluminized vapor-barrier film.
1. Pressure Rating: 10-inch wg positive and 1.0-inch wg negative.
2. Maximum Air Velocity: 5500 fpm.
3. Temperature Range: Minus 10 to plus 160 deg F.
4. Insulation R-value: Comply with ASHRAE/IESNA 90.1.

C. Flexible Duct Connectors:
1. Clamps: Stainless-steel band with cadmium-plated hex screw to tighten band with a worm-gear action in sizes 3 through 18 inches, to suit duct size.
2. Non-Clamp Connectors: Adhesive plus sheet metal screws.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install duct accessories according to applicable details in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for metal ducts and in NAIMA AH116, "Fibrous Glass Duct Construction Standards," for fibrous-glass ducts.

B. Install duct accessories of materials suited to duct materials; use galvanized-steel accessories in galvanized-steel and fibrous-glass ducts, stainless-steel accessories in stainless-steel ducts, and aluminum accessories in aluminum ducts.

C. Install backdraft dampers at inlet of exhaust fans or exhaust ducts as close as possible to exhaust fan unless otherwise indicated.

D. Install volume dampers at points on supply, return, and exhaust systems where branches extend from larger ducts. Where dampers are installed in ducts having duct liner, install dampers with hat channels of same depth as liner, and terminate liner with nosing at hat channel.

1. Install steel volume dampers in steel ducts.
2. Install aluminum volume dampers in aluminum ducts.

E. Set dampers to fully open position before testing, adjusting, and balancing.

F. Install test holes at fan inlets and outlets and elsewhere as indicated.

G. Install fire and smoke dampers according to UL listing.

H. Connect ducts to duct silencers rigidly.

I. Install duct access doors on sides of ducts to allow for inspecting, adjusting, and maintaining accessories and equipment at the following locations:

1. On both sides of duct coils.
2. Upstream from duct filters.
3. At outdoor-air intakes and mixed-air plenums.
4. At drain pans and seals.
5. Downstream from manual volume dampers, control dampers, backdraft dampers, and equipment.
6. Adjacent to and close enough to fire or smoke dampers, to reset or reinstall fusible links. Access doors for access to fire or smoke dampers having fusible links shall be pressure relief access doors and shall be outward operation for access doors installed upstream from dampers and inward operation for access doors installed downstream from dampers.
7. At each change in direction and at maximum 50-foot spacing.
8. Upstream from turning vanes.
9. Upstream or downstream from duct silencers.
10. Control devices requiring inspection.
11. Elsewhere as indicated.

J. Install access doors with swing against duct static pressure.

K. Access Door Sizes:

1. One-Hand or Inspection Access: 8 by 5 inches.
2. Two-Hand Access: 12 by 6 inches.

3. Head and Hand Access: 18 by 10 inches.
4. Head and Shoulders Access: 21 by 14 inches.
5. Body Access: 25 by 14 inches.
6. Body plus Ladder Access: 25 by 17 inches.

L. Label access doors according to Section 230553 "Identification for HVAC Piping and Equipment" to indicate the purpose of access door.

M. Install flexible connectors to connect ducts to equipment.

N. For fans developing static pressures of 5-inch wg and more, cover flexible connectors with loaded vinyl sheet held in place with metal straps.

O. Connect diffusers to ducts with maximum 60-inch lengths of flexible duct clamped or strapped in place.

P. Connect flexible ducts to metal ducts with draw bands.

Q. Install duct test holes where required for testing and balancing purposes.

R. Install thrust limits at centerline of thrust, symmetrical on both sides of equipment. Attach thrust limits at centerline of thrust and adjust to a maximum of 1/4-inch movement during start and stop of fans.

3.02 FIELD QUALITY CONTROL

A. Tests and Inspections:
1. Operate dampers to verify full range of movement.
2. Inspect locations of access doors and verify that purpose of access door can be performed.
3. Operate fire, smoke, and combination fire and smoke dampers to verify full range of movement and verify that proper heat-response device is installed.
4. Inspect turning vanes for proper and secure installation.
5. Operate remote damper operators to verify full range of movement of operator and damper.

END OF SECTION

SECTION 23 34 23
HVAC POWER VENTILATORS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Centrifugal roof ventilators.

1.02 PERFORMANCE REQUIREMENTS

A. Project Altitude: Base fan-performance ratings on actual project site elevations.

B. Operating Limits: Classify according to AMCA 99.

1.03 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, and furnished specialties and accessories. Also include the following:

1. Certified fan performance curves with system operating conditions indicated.
2. Certified fan sound-power ratings.
3. Motor ratings and electrical characteristics, plus motor and electrical accessories.
4. Material thickness and finishes, including color charts.
5. Dampers, including housings, linkages, and operators.
6. Roof curbs.
7. Fan speed controllers.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
2. Wiring Diagrams: For power, signal, and control wiring.

1.04 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Reflected ceiling plans and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from Installers of the items involved:

1. Roof framing and support members relative to duct penetrations.
2. Ceiling suspension assembly members.
3. Size and location of initial access modules for acoustical tile.
4. Ceiling-mounted items including light fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.

B. Field quality-control reports.

1.05 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For power ventilators to include in emergency, operation, and maintenance manuals.

1.06 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. Belts: One set for each belt-driven unit.

1.07 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. AMCA Compliance: Fans shall have AMCA-Certified performance ratings and shall bear the AMCA-Certified Ratings Seal.

C. UL Standards: Power ventilators shall comply with UL 705. Power ventilators for use for restaurant kitchen exhaust shall also comply with UL 762.

1.08 COORDINATION

A. Coordinate size and location of structural-steel support members.

B. Coordinate sizes and locations of concrete bases with actual equipment provided.

C. Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided.

PART 2 - PRODUCTS

2.01 CENTRIFUGAL ROOF VENTILATORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Greenheck Fan Corporation.
2. Loren Cook Company.
3. Aerovent; a division of Twin City Fan Companies, Ltd.

B. Housing: Removable, spun-aluminum, dome top and outlet baffle; square, one-piece, aluminum base with venturi inlet cone.

1. Upblast Units: Provide spun-aluminum discharge baffle to direct discharge air upward, with rain and snow drains.

C. Fan Wheels: Aluminum hub and wheel with backward-inclined blades.

D. Belt Drives:

1. Resiliently mounted to housing.
2. Fan Shaft: Turned, ground, and polished steel; keyed to wheel hub.

3. Shaft Bearings: Permanently lubricated, permanently sealed, self-aligning ball bearings.
4. Pulleys: Cast-iron, adjustable-pitch motor pulley.
5. Fan and motor isolated from exhaust airstream.

E. Accessories:

1. Variable-Speed Controller: Solid-state control to reduce speed from 100 to less than 50 percent.
2. Disconnect Switch: Nonfusible type, with thermal-overload protection mounted outside fan housing, factory wired through an internal aluminum conduit.
3. Bird Screens: Removable, 1/2-inch mesh, aluminum or brass wire.
4. Dampers: Counterbalanced, parallel-blade, backdraft dampers mounted in curb base; factory set to close when fan stops.
5. .

F. Roof Curbs: Galvanized steel; mitered and welded corners; 1-1/2-inch- thick, rigid, fiberglass insulation adhered to inside walls; and 1-1/2-inch wood nailer. Size as required to suit roof opening and fan base.

1. Configuration: Built-in cant and mounting flange.
2. Overall Height: As required to maintain 12” above finish roof.
3. Sound Curb: Curb with sound-absorbing insulation.
4. Pitch Mounting: Manufacture curb for roof slope.
5. Metal Liner: Galvanized steel.

2.02 MOTORS

A. Motor Sizes: Minimum size as indicated. If not indicated, large enough so driven load will not require motor to operate in service factor range above 1.0.

B. Enclosure Type: Totally enclosed, fan cooled.

2.03 SOURCE QUALITY CONTROL

A. Certify sound-power level ratings according to AMCA 301, "Methods for Calculating Fan Sound Ratings from Laboratory Test Data." Factory test fans according to AMCA 300, "Reverberant Room Method for Sound Testing of Fans." Label fans with the AMCA-Certified Ratings Seal.

B. Certify fan performance ratings, including flow rate, pressure, power, air density, speed of rotation, and efficiency by factory tests according to AMCA 210, "Laboratory Methods of Testing Fans for Aerodynamic Performance Rating." Label fans with the AMCA-Certified Ratings Seal.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install power ventilators level and plumb.

B. Equipment Mounting:

1. Install power ventilators on cast-in-place concrete equipment base(s). Comply with requirements for equipment bases and foundations specified in other sections.

C. Secure roof-mounted fans to roof curbs with cadmium-plated hardware.

D. Ceiling Units: Suspend units from structure; use steel wire or metal straps.

E. Support suspended units from structure using threaded steel rods and spring hangers having a static deflection of 1 inch.

F. Install units with clearances for service and maintenance.

G. Label units according to requirements specified in Section 230553 "Identification for HVAC Piping and Equipment."

3.02 CONNECTIONS

A. Drawings indicate general arrangement of ducts and duct accessories. Make final duct connections with flexible connectors. Flexible connectors are specified in Section 233300 "Air Duct Accessories."

B. Install ducts adjacent to power ventilators to allow service and maintenance.

3.03 FIELD QUALITY CONTROL

A. Perform tests and inspections.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

B. Tests and Inspections:

1. Verify that shipping, blocking, and bracing are removed.
2. Verify that unit is secure on mountings and supporting devices and that connections to ducts and electrical components are complete. Verify that proper thermal-overload protection is installed in motors, starters, and disconnect switches.
3. Verify that cleaning and adjusting are complete.
4. Disconnect fan drive from motor, verify proper motor rotation direction, and verify fan wheel free rotation and smooth bearing operation. Reconnect fan drive system, align and adjust belts, and install belt guards.
5. Adjust belt tension.
6. Adjust damper linkages for proper damper operation.
7. Verify lubrication for bearings and other moving parts.
8. Verify that manual and automatic volume control and fire and smoke dampers in connected ductwork systems are in fully open position.
9. Disable automatic temperature-control operators, energize motor and adjust fan to indicated rpm, and measure and record motor voltage and amperage.
10. Shut unit down and reconnect automatic temperature-control operators.
11. Remove and replace malfunctioning units and retest as specified above.

C. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Prepare test and inspection reports.

3.04 ADJUSTING

A. Adjust damper linkages for proper damper operation.

B. Adjust belt tension.

C. Comply with requirements in Section 230593 "Testing, Adjusting, and Balancing for HVAC" for testing, adjusting, and balancing procedures.

D. Replace fan and motor pulleys as required to achieve design airflow.

E. Lubricate bearings.

END OF SECTION

SECTION 23 37 13

DIFFUSERS, REGISTERS, AND GRILLES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Modular core, square ceiling diffusers.
2. Perforated diffusers.

B. Related Sections:

1. Section 233300 "Air Duct Accessories" for fire and smoke dampers and volume-control dampers not integral to diffusers, registers, and grilles.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of product indicated, include the following:

1. Data Sheet: Indicate materials of construction, finish, and mounting details; and performance data including throw and drop, static-pressure drop, and noise ratings.
2. Diffuser, Register, and Grille Schedule: Indicate drawing designation, room location, quantity, model number, size, and accessories furnished.

1.03 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from Installers of the items involved:

1. Ceiling suspension assembly members.
2. Method of attaching hangers to building structure.
3. Size and location of initial access modules for acoustical tile.
4. Ceiling-mounted items including lighting fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.
5. Duct access panels.

B. Source quality-control reports.

PART 2 - PRODUCTS

2.01 CEILING DIFFUSERS

A. Modular Core, Square Ceiling Diffuser:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Price Industries.

b. Titus.

c. Anemostat Products; a Mestek company.

2. Devices shall be specifically designed for variable-air-volume flows.
3. Material: Steel.
4. Finish: Baked enamel, color selected by Architect.
5. Face Style: Modular Core.
6. Mounting: Surface.
7. Pattern: Adjustable.

B. Perforated Diffuser:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Price Industries.

b. Titus.

c. Anemostat Products; a Mestek company.

2. Devices shall be specifically designed for variable-air-volume flows.
3. Material: Steel.
4. Finish: Baked enamel, color selected by Architect.
5. Duct Inlet: Square.
6. Face Style: Flush.
7. Mounting: T-bar.
8. Pattern Controller: Adjustable with louvered pattern modules at inlet.

2.02 REGISTERS AND GRILLES

A. Adjustable Bar Grille:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Price Industries.

b. Titus.

c. Anemostat Products; a Mestek company.

2. Material: Steel.
3. Finish: Baked enamel, color selected by Architect.
4. Face Blade Arrangement: Horizontal spaced 3/4 inch apart.
5. Core Construction: Integral.
6. Rear-Blade Arrangement: Vertical spaced 3/4 inch apart.
7. Mounting: Concealed.

2.03 SOURCE QUALITY CONTROL

A. Verification of Performance: Rate diffusers, registers, and grilles according to ASHRAE 70, "Method of Testing for Rating the Performance of Air Outlets and Inlets."

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine areas where diffusers, registers, and grilles are to be installed for compliance with requirements for installation tolerances and other conditions affecting performance of equipment.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Install diffusers, registers, and grilles level and plumb.

B. Ceiling-Mounted Outlets and Inlets: Drawings indicate general arrangement of ducts, fittings, and accessories. Air outlet and inlet locations have been indicated to achieve design requirements for air volume, noise criteria, airflow pattern, throw, and pressure drop. Make final locations where indicated, as much as practical. For units installed in lay-in ceiling panels, locate units in the center of panel. Where architectural features or other items conflict with installation, notify Architect for a determination of final location.

C. Install diffusers, registers, and grilles with airtight connections to ducts and to allow service and maintenance of dampers, air extractors, and fire dampers.

3.03 ADJUSTING

A. After installation, adjust diffusers, registers, and grilles to air patterns indicated, or as directed, before starting air balancing.

END OF SECTION

SECTION 26 05 00

COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.1 SUMMARY

A. This Section covers general work of all Sections under Division 26.

B. Provide a complete working electrical installation with all equipment called for in proper operating condition. Documents do not undertake to show or list every item to be provided. When an item not shown or listed is clearly necessary for proper operation of equipment which is shown or listed, provide the item which will allow the system to function properly at no increase in Contract Price.

1.2 REFERENCES

A. The General Conditions, Supplementary Conditions, and applicable portions of Divisions 01 and 26 apply to the work of this Section as if printed herein.

1.3 SUBMITTALS

A. Forward all submittals in related groups. Individual or incomplete submittals are not acceptable.

B. Identify each item by manufacturer, brand, trade name, number, size, rating, or whatever other data is necessary to properly identify and check materials and equipment.

C. Identify each submittal item by reference to Specification Section paragraph in which item is specified or Drawing and Detail number.

D. Organize submittals in same sequence as they appear in Specification Sections, articles or paragraphs.

E. Shop Drawings shall show physical arrangement, construction details and finishes.
   1) Drawings shall be drawn to scale and dimensioned where applicable.

   2) Catalog cuts and published material may be included to supplement scale drawings.

F. Internal wiring diagrams of equipment shall show wiring as actually furnished for this project with all optional items clearly identified as included or excluded. Clearly identify external wiring connections. Identify and obliterate superfluous material.

G. Binders: Prepare submittal material in accordance with the following:

1) Insert all literature in standard 3-ring binders for 8-1/2 inch by 11 inch pages with individual tabs. Do not staple literature on different products together.

2. Number all binders on the outside of the cover and indicate the Specification Section. Mark Binder No. 1 Architect's copy and No. 2 Engineer's copy. Both of these binders shall contain original manufacturer's literature.

3. Provide an index with binder. This index shall follow the same sequence as the Specifications.

H. Submittal literature, drawings and wiring diagrams shall be specifically applicable to this Project and shall not contain extraneous material or optional choices. Clearly mark literature to indicate the proposed item. Submittals shall include, but not be limited to those items listed in individual Sections.

1. Include all physical and performance data, including materials, manufacturer's names, model numbers, weights, sizes, capacities, performance curves, finishes, colors, accessories and all other data required to completely describe equipment and to indicate complete compliance with Specifications and Drawings.

2. Include with complete submittals above, complete, large scale, dimensioned Shop Drawings, certified by manufacturer, of all major equipment and other equipment as directed by Architect.

I. Resubmittals will be reviewed for compliance with comment made on the original submittal only and should be marked with a resubmittal number and dated.

J. Operating & Maintenance Instructions and Manuals:

1. Subsequent to final completions and testing operations, this Division is responsible for instructing the Owner's authorized representatives in operation, adjustment and maintenance of electrical plant.

2. Submit three (3) copies of certificate, signed by Owner's Representatives, attesting to their having been instructed.

3. Before Owner's personnel assume operation of systems, submit three (3) sets of operating maintenance manuals. Bind data in vinyl covered loose-leaf binders with title index tabs identifying items therein to include:

a. Fire Alarm and Smoke Detection System

b. Miscellaneous Signal Systems.

4. Provide two (2) full size prints of Record Drawing One-Line Diagram, in metal frame with glass front. Obtain record drawing prints from Architect at Contractor's cost and have prints framed in location as directed.

K. Submit as-built drawings showing actual constructed conditions.

1.4 QUALITY ASSURANCE

A. Materials and Systems:
   1. Labels: Provide materials listed and labeled by Underwriters' Laboratories otesting firm acceptable to authority having jurisdiction, where listing service is normally provided for product.

   2. Materials: Provide new and ship to jobsite in original manufacturer's containers or bundles.

B. Workmanship: Arrange work to obtain coordinated installation.

C. Code Compliance: Comply with applicable codes, laws, rules, regulations, and standards of applicable code-enforcing authorities.

D. References and Standards: All materials and equipment shall comply with all applicable standards and requirements of the standards listed below. Nothing in the Drawings or Specifications shall be construed to permit Work not conforming to applicable laws, ordinances, rules and regulations. It is not the intent of Drawings or Specifications to repeat requirements of codes except where necessary for completeness or clarity.

1. American National Standards Institute (ANSI).

2. Association of Edison Illuminating Companies (AEIC).

3. Insulated Cable Engineers Association (ICEA).

4. Institute of Electrical and Electronics Engineers (IEEE).

5. National Electrical Manufacturer's Association (NEMA).

6. Underwriters' Laboratories, Inc. (UL).

7. 2025 California Administrative Code (CAC), Pat 1, Title 24 CCR.

8. 2025 California Building Code (CBC), Part 2, Title 24 CCR.

9. 2025 California Electrical Code (CEC), Part 3, Title 24 CCR.

10. 2025 California Mechanical Code (CMC), Part 4, Title 24 CCR.

11. 2025 California Plumbing Code (CPC), Part 5, Title 24 CCR.

12. 2025 California Energy Code, Part 6, Title 24 CCR.

13. 2025 California Fire Code (CFC), Part 9, Title 24 CCR.

14. 2025 California Existing Building Code (CEBC), Part 10, Title 24 CCR.

15. 2025 California Green Building Code (CAL Green), Part 11, Title 24 CCR.

16. 2025 California Referenced Standards Code Part 12, Title 24 CCR.

17. State of California Low-Voltage Electrical Safety Orders (CAL/OSHA).

18. State of California High-Voltage Electrical Safety Orders (CAL/OSHA).

19. APPLICABLE STANDARDS

20. For a list of applicable standards, including California amendments for the NFPA Standards, refer to CBC Chapter 35 and CFC Chapter 80.

E. Codes and regulations noted in other Sections in Division 26, applicable State and Local Codes and Ordinances. If any of the requirements of the above are in conflict with one another, or with the requirements of these specifications, the most stringent requirement shall govern.

1.4 DELIVERY, STORAGE AND HANDLING

A. Protect from loss or damage. Replace lost or damaged materials and equipment with new at no increase in Contract Sum.

1.6 DRAWINGS AND COORDINATION WITH OTHER WORK

A. DRAWINGS:

1. For purposes of clarity, legibility, Drawings are essentially diagrammatic.

2. Exact routing of wiring and locations of outlets, panels, etc., shall be governed by structural conditions, obstructions and existing conditions. Architect reserves right, at no increase in price, to make any reasonable change in locations of electrical items, exposed at ceiling and/or on walls, to group them into orderly relationships and/or increase their utility. Contractor shall verify Architect's requirements in this regard prior to roughing-in.

3. Dimensions, location of doors, partitions, and similar physical features shall be taken from Architectural Drawings for exact location of outlets to center with Architectural features, panels, etc., at the approximate location shown on Electrical Drawings.

4. Mounting heights of brackets, outlets, etc., shall be as required to suit equipment served.

5. Drawings indicate, generally, routes of all branch circuits. All runs to panels are indicated as starting from nearest outlet, pointing in direction of panel. Continue all such circuits to panel as though routes were indicated in their entirety.

B. Coordination:

1. Work out all "tight" conditions involving Work under this Division and Work in other Divisions in advance of installation. If necessary, and before Work proceeds in these areas, prepare supplementary Drawings under this Division for review, showing all Work in "tight" area. Provide supplementary Drawings and additional Work necessary to overcome "tight" conditions.

2. Differences or disputes concerning coordination, interference or extent of Work between Divisions shall be decided by Contractor. His decision, if consistent with Contract Documents requirements, shall be final.

3. Coordinate electrical power and control wiring requirements of mechanical equipment with Division 23.

4. Where conflict exists between rough-in shown on drawings and that shown or required by equipment to be installed, obtain clarification from Architect and provide rough-in as directed.

5. Provide templates, information and instructions to other Divisions to properly locate holes and openings to be cut or provided for Electrical Work.

6. Coordinate chases, slots, inserts, sleeves, and openings for electrical supports, raceways, and cable with general construction work.

7. Sequence, coordinate, and integrate installing electrical materials and equipment for efficient flow of the Work. Coordinate installing large equipment that requires positioning before closing in the building.

8. Coordinate location of access panels and doors for electrical items that are concealed by finished surfaces.

9. Where electrical identification devices are applied to field-finished surfaces, coordinate installation of identification devices with completion of finished surface.

C. Large Scale Layout Drawings: Prepare large scale detailed layout Drawings showing locations of equipment, conduit runs, panels, and all other elements of electrical systems where required by other Sections of this Division, plus sections of all congested areas to show relative position and spacing of affected elements. All symbols and designations used in preparing record Drawings shall match those used in Contract Drawings.

D. Equipment Rough-In:

10. 1. Rough-in locations shown on Electrical Drawings for equipment furnished by Owner and for equipment furnished under other Divisions are approximate only.

    a. Obtain exact rough-in locations from following sources:

        1) From shop drawings for Contractor-furnished and installed equipment.

2) From Architect for Owner-furnished Contractor-installed equipment.

2. Verify electrical characteristics of equipment before starting rough-in. Where conflict exists between equipment and rough-in shown on Drawings obtain clarification from Architect and provide as directed.

3. Unless otherwise shown or specified, provide direct raceway and conductor connections from building wiring system to equipment terminals for direct connected equipment which is Contractor furnished and Contractor installed, Owner furnished and Contractor installed.

4. Provide plug-in receptacle cap for cord connected equipment which is Contractor furnished and Contractor installed, Owner furnished and Contractor installed. Provide new cord and cap if required on Owner furnished and Contractor installed equipment.

5. Provide disconnect switches, flush type in finished spaces, where shown or required by code for direct connected equipment.

PART 2 - PRODUCTS

2.1 MATERIALS FURNISHED

A. New, bearing label of Underwriter's Laboratories, or other testing laboratory acceptable to authority having jurisdiction, where labeling exists for the class of equipment.

B. Provide equipment of one manufacturer, alike in appearance and function.

C. For equipment specified by manufacturer's number, include all accessories, controls, etc., listed in catalogue as standard with equipment. Furnish optional or additional accessories as specified.

D. Where no specific make of material or equipment is mentioned, use any product of reputable manufacturer which conforms to requirements of system and other applicable specification sections.

E. Equipment and material damaged during transportation, installation, or operation is considered as totally damaged. Replace with new. Variance from this permitted only with written approval.

F. Provide an authorized representative to constantly supervise Work of this Division, check all materials prior to installation for conformance with Drawings, Specifications, and reviewed Shop Drawings.

2.2 SUPPORTING DEVICES

A. Material: Cold-formed steel, with corrosion-resistant coating.

B. Metal Items for Use Outdoors or in Damp Locations: Hot-dip galvanized steel.

C. Slotted-Steel Channel: Flange edges turned toward web, and 9/16-inch- diameter slotted holes at a maximum of 2 inches o.c., in webs. Strength rating to suit structural loading.

D. Slotted Channel Fittings and Accessories: Recommended by the manufacturer for use with the type and size of channel with which used.

1) Materials: Same as channels and angles, except metal items may be stainless steel.

E. Raceway and Cable Supports: Manufactured clevis hangers, riser clamps, straps, threaded C-clamps with retainers, ceiling trapeze hangers, wall brackets, and spring-steel clamps or click-type hangers.

F. Pipe Sleeves: ASTM A 53, Type E, Grade A, Schedule 40, galvanized steel, plain ends.

G. Cable Supports for Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug for non-armored electrical cables in riser conduits. Plugs have number and size of conductor gripping holes as required to suit individual risers. Body constructed of malleable-iron casting with hot-dip galvanized finish.

H. Expansion Anchors: Carbon-steel wedge or sleeve type.

I. Toggle Bolts: All-steel springhead type.

J. Powder-Driven Threaded Studs: Heat-treated steel.

2.3 ELECTRICAL IDENTIFICATION

A. Colored Adhesive Marking Tape for Raceways, Wires, and Cables: Self-adhesive vinyl tape, not less than 1-inch wide by 3 mils thick.

B. Tape Markers for Conductors: Vinyl or vinyl-cloth, self-adhesive, wraparound type with preprinted numbers and letters.

C. Color-Coding Cable Ties: Type 6/6 nylon, self-locking type. Colors to suit coding scheme.

D. Underground Warning Tape: Permanent, bright-colored, continuous-printed, vinyl tape compounded for permanent direct-burial service, and with the following features:

2) 1. Not less than 6 inches wide by 4 mils thick.

3) 2. Embedded continuous metallic strip or core.

4) 3. Printed legend that indicates type of underground line.

E. Engraved-Plastic Labels, Signs, and Instruction Plates: Engraving stock, melamine plastic laminate punched or drilled for mechanical fasteners 1/16-inch minimum thickness for

signs up to 20 sq. in. and 1/8-inch minimum thickness for larger sizes. Engraved legend in black letters on white background.

F. Warning and Caution Signs: Preprinted; comply with 29 CFR 1910.145, Chapter XVII. Colors, legend, and size appropriate to each application.

5) 1. Interior Units: Aluminum, baked-enamel-finish, punched or drilled for mechanical fasteners.

6) 2. Exterior Units: Weather-resistant, non-fading, preprinted, cellulose-acetate butyrate with 0.0396-inch, galvanized-steel backing. 1/4-inch grommets in corners for mounting.

G. Fasteners for Nameplates and Signs: Self-tapping, stainless-steel screws or No. 10/32 stainless-steel machine screws with nuts and flat and lock washers.

H. Electrical Outlets: Dymo labels, self-adhesive.

2.4 CONCRETE BASES

A. Concrete Forms and Reinforcement Materials: As specified in Section 033000"Cast-in-Place Concrete."

B. Concrete: 3000-psi, 28-day compressive strength.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Manufacturer's Directions: Follow in all cases where manufacturers of articles used furnish directions covering points not specified or shown.

B. Equipment: Accurately set and leveled with supports neatly placed and properly fastened as shown and specified. Provide means of bringing in and installing equipment into position inside building. Install to facilitate service, maintenance and repair or replacement of components. Connect for ease of disconnecting with minimum interference with other installations.

C. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom.

D. Materials and Components: Install level, plumb, and parallel and perpendicular to other building systems and components, unless otherwise indicated.

E. Right of Way: Give to raceways and piping systems installed at a required slope.

F. Conduit Systems:

1. Worked into complete, integrated arrangement with like elements to make Work neat appearing, finished.

2. Run concealed, except as shown or noted otherwise. Where exposed, install parallel with walls or structural elements: vertical runs plumb; horizontal runs level or parallel with structure as appropriate: groups racked together neatly with straight runs and bends both parallel and uniformly spaced.

3. Install as high as practicable to maintain adequate head room shown or required. Coordinate with Work of other Divisions to achieve proper headroom.

4. Flash and counter-flash all conduits through roof in accordance with requirements of Section 076200.

5. Clearance: Do not obstruct spaces required by code in front of electrical equipment, access doors, etc.

G. Penetrations:

1. Pack space between conduit, sleeve in walls with non-combustible materials.

2. Make penetrations through floors water-tight with non-hardening sealant even though concealed within wall or furred space.

3. Make penetrations through any damp-proofed/water-proofed surfaces damp-proof/water-proof by appropriate means to maintain integrity of system penetrated.

4. Seal around penetrations with fireproofing material to maintain integrity of fire rating where occurs.

H. Provide shrouds at light fixtures, electrical panelboards and like items to maintain integrity of rated wall or ceiling construction.

I. Hangers, Supports, Anchors and Chases:

1. Provide complete as required for installation of Electrical Work.

2. Equipment to be of metal only: no wood or combustible material will be permitted including supports for outlet boxes.

3. Hangers, anchors and supports for conduit runs: As specified.

4. Provide concrete insets for attachment of hangers; subject to structural engineer's review.

5. Provide anchors for floor and wall mounted equipment.

6. Provide supports for wall mounted equipment.

3.2 ELECTRICAL SUPPORTING DEVICE APPLICATION

A. Damp Locations and Outdoors: Hot-dip galvanized materials or nonmetallic, slotted channel system components.

B. Dry Locations: Steel materials.

C. Strength of Supports: Adequate to carry present and future loads, times a safety factor of at least four with, 200-lb minimum design load for each support element.

3.3 SUPPORT INSTALLATION

A. Support parallel runs of horizontal raceways together on trapeze- or bracket-type hangers.

B. Size supports for multiple raceway or cable runs so capacity can be increased by a 25 percent minimum in the future.

C. Support individual horizontal single raceways with separate, malleable-iron pipe hangers or clamps except use spring-steel fasteners for 1-1/2-inch and smaller single raceways above suspended ceilings and for fastening raceways to slotted channel and angle supports.

D. Install sleeves for cable and raceway penetrations of concrete slabs and walls unless core-drilled holes are used. Install sleeves for cable and raceway penetrations of masonry and fire-rated gypsum walls and of all other fire-rated floor and wall assemblies. Install sleeves during erection of concrete and masonry walls.

E. Secure electrical items and their supports to building structure, using the following methods unless other fastening methods are indicated:

1) 1. Wood: Wood screws or screw-type nails.

2) 2. Gypsum Board: Toggle bolts. Seal around sleeves with joint compound, both sides of wall.

3. Masonry: Toggle bolts on hollow block and expansion bolts on solid block. Seal around sleeves with mortar, both sides of wall.

4. New Concrete: Concrete inserts with machine screws and bolts.

5. Existing Concrete: Expansion bolts.

6. Structural Steel: Spring-tension clamps.

a) Comply with AWS D1.1 for field welding.

7. Light Steel Framing: Sheet metal screws.

8. Fasteners for Damp, Wet, or Weather-Exposed Locations: Stainless steel.

9. Light Steel: Sheet-metal screws.

10. Fasteners: Select so load applied to each fastener does not exceed 25 percent of its proof-test load.

3.4 IDENTIFICATION MATERIALS AND DEVICES

A. Install at locations for most convenient viewing without interference with operation and maintenance of equipment.

B. Coordinate names, abbreviations, colors, and other designations used for electrical identification with corresponding designations indicated in the Contract Documents or required by codes and standards. Use consistent designations throughout Project.

C. Self-Adhesive Identification Products: Clean surfaces before applying.

D. Tag and label circuits designated to be extended in the future. Identify source and circuit numbers in each cabinet, pull and junction box, and outlet box. Color-coding may be used for voltage and phase identification.

E. Install continuous underground plastic markers during trench backfilling, for exterior underground power, control, signal, and communication lines located directly above power and communication lines. Locate 6 to 8 inches below finished grade. If width of multiple lines installed in a common trench or concrete envelope does not exceed 16 inches, overall, use a single line marker.

F. Install warning, caution, and instruction signs where required to comply with 29 CFR 1910.145, Chapter XVII, and where needed to ensure safe operation and maintenance of electrical systems and of items to which they connect. Indoors install engraved plastic-laminated instruction signs with approved legend where instructions are needed for system or equipment operation. Install metal-backed butyrate signs for outdoor items.

G. Install engraved-laminated emergency-operating signs with white letters on red background with minimum 3/8-inch- high lettering for emergency instructions on power transfer, load shedding, and other emergency operations.

3.5 FIRESTOPPING

A. Apply firestopping to cable and raceway sleeves and other penetrations of fire-rated floor and wall assemblies to restore original undisturbed fire-resistance ratings of assemblies. Firestopping installation is specified in Section 07 84 00 “Penetration Firestopping”.

3.6 CONCRETE BASES

A. Construct concrete bases of dimensions indicated, but not less than 4 inches larger, in both directions, than supported unit. Follow supported equipment manufacturer's anchorage recommendations and setting templates for anchor-bolt and tie locations, unless otherwise indicated.

3.7 DEMOLITION

A. Protect existing electrical equipment and installations indicated to remain. If damaged or disturbed in the course of the Work, remove damaged portions and install new products of equal capacity, quality, and functionality.

B. Accessible Work: Remove exposed electrical equipment and installations, indicated to be demolished, in their entirety.

C. Abandoned Work: Cut and remove buried raceway and wiring, indicated to be abandoned in place, 2 inches below the surface of adjacent construction. Cap raceways and patch surface to match existing finish.

D. Remove, store, clean, reinstall, reconnect, and make operational components indicated for relocation.

3.8 CUTTING AND PATCHING

A. Do all cutting, repairing, including structural reinforcing, necessary for Work under this Division. Cut, channel, chase, and drill floors, walls, partitions, ceilings, and other surfaces required to permit electrical installations. Perform cutting by skilled mechanics of trades involved.

B. Do not do any cutting or patching without approval. Repair, refinish and touch up disturbed finish materials and other surfaces to match adjacent undisturbed surfaces equal to original condition in Architect’s opinion.

3.9 EXCAVATING & BACKFILLING

A. Provide as required for installation of work under this Division in accordance with requirements of Section 321216 and 321313.

B. Provide all necessary shoring, pumping as part of Work of this Division.

C. In any asphalt or concrete paved areas, backfill only to sub grade level.

3.10 TESTING AND ADJUSTING

A. Furnish all labor and test equipment required under this Division.

B. Test panels and branch circuits for grounds or shorts. Repair defective wiring as required.

C. Test each individual circuit at panel for proper operation.

D. Upon completion of Work, make final inspection; operate equipment under normal conditions, to satisfaction of Architect.

E. At completion of Work, provide written certification that all systems are functioning properly without defects.

F. Test all feeders for line-to-ground and line-to-line resistance with a 500 VDC motor driven "Megger". Minimum acceptable resistance is 100 meg-ohms. Schedule all feeders and indicate line-to-ground and line-to-line resistances. Have all tests witnessed by Architect or his authorized representative.

G. Perform testing at a time suitable to the Architect and Owner. Advise the Architect a minimum of two weeks prior to testing so that he can arrange to be present if he desires.

H. Provide for Grounding System: Test for ground currents with all equipment energized. Include ground impedance test by 2 or 3-point fall-of-potential method.

I. Submit six (6) sets of test reports for review.

3.11 CLEANING AND PAINTING

A. Properly prepare Work under this Division to be finish painted under Section 09 90 00.

B. Refinish Work supplied with final finish under this Division if damaged under this Division to satisfaction of Architect.

C. After other Work is accomplished, clean exposed conduit, panels (interiors and exteriors), fixtures, equipment and leave in satisfactory condition.

3.12 VOLTAGE CHECK

A. At completion of job, check voltage at several points of utilization on the system which has been installed under this Contract. During test, energize all installed loads.

B. Adjust taps on transformers to give proper voltage, which is 118 to 122 volts for 120-volt nominal systems and proportionately equivalent for higher voltage systems. If proper voltage cannot be obtained, inform the Architect and the Owner.

END OF SECTION

SECTION 26 05 03

EQUIPMENT WIRING CONNECTIONS

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes electrical connections to equipment.

B. Related Sections:
1. Section 260519 - Low-Voltage Electrical Power Conductors and Cable.
2. Section 260533 - Raceway and Boxes for Electrical Systems.

1.2 REFERENCES

A. National Electrical Manufacturers Association:
1. NEMA WD 1 - General Requirements for Wiring Devices.
2. NEMA WD 6 - Wiring Devices-Dimensional Requirements.

1.3 SUBMITTALS

A. Section 013300 - Submittal Procedures.

B. Product Data: Submit wiring device manufacturer’s catalog information showing dimensions, configurations, and construction.

C. Manufacturer's installation instructions.

1.4 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Procedures.

1.5 COORDINATION

A. Obtain and review shop drawings, product data, manufacturer’s wiring diagrams, and manufacturer's instructions for equipment furnished under other sections.

B. Determine connection locations and requirements.

C. Sequence rough-in of electrical connections to coordinate with installation of equipment.

D. Sequence electrical connections to coordinate with start-up of equipment.

PART 2 - PRODUCTS

2.1 CORD AND PLUGS

A. Manufacturers:
1. Leviton.
2. Arrow Hart.
3. Pass & Seymour.
4. Eagle.

B. Attachment Plug Construction: Conform to NEMA WD 1.

C. Configuration: NEMA WD 6; match receptacle configuration at outlet furnished for equipment.

D. Cord Construction: Type SO multiconductor flexible cord with identified equipment grounding conductor, suitable for use in damp locations.

E. Size: Suitable for connected load of equipment, length of cord, and rating of branch circuit overcurrent protection.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify equipment is ready for electrical connection, for wiring, and to be energized.

3.2 EXISTING WORK

A. Remove exposed abandoned equipment wiring connections, including abandoned connections above accessible ceiling finishes.

B. Disconnect abandoned utilization equipment and remove wiring connections. Remove abandoned components when connected raceway is abandoned and removed. Install blank cover for abandoned boxes and enclosures not removed.

C. Extend existing equipment connections using materials and methods compatible with existing electrical installations.

3.3 INSTALLATION

A. Make electrical connections.

B. Make conduit connections to equipment using flexible conduit. Use liquid-tight flexible conduit with watertight connectors in damp or wet locations.

C. Connect heat producing equipment using wire and cable with insulation suitable for temperatures encountered.

D. Install receptacle outlet to accommodate connection with attachment plug.

E. Install cord and cap for field-supplied attachment plug.

F. Install suitable strain-relief clamps and fittings for cord connections at outlet boxes and equipment connection boxes.

G. Install disconnect switches, controllers, control stations, and control devices to complete equipment wiring requirements.

H. Install terminal block jumpers to complete equipment wiring requirements.

I. Install interconnecting conduit and wiring between devices and equipment to complete equipment wiring requirements.

3.4 ADJUSTING

A. Section 01 70 00 - Execution and Closeout Procedures.

B. Cooperate with utilization equipment installers and field service personnel during checkout and starting of equipment to allow testing and balancing and other startup operations. Provide personnel to operate electrical system and checkout wiring connection components and configurations.

END OF SECTION

SECTION 26 05 11

REQUIREMENTS FOR ELECTRICAL INSTALLATIONS

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section applies to all sections of Division 26.

B. Furnish and install electrical systems, materials, equipment, and accessories in accordance with the specifications and drawings. Capacities and ratings of motors, transformers, conductors and cable, switchboards, switchgear, panelboards, motor control centers, generators, automatic transfer switches, and other items and arrangements for the specified items are shown on the drawings.

C. Electrical service entrance equipment and arrangements for temporary and permanent connections to the electric utility company's system shall conform to the electric utility company's requirements. Coordinate fuses, circuit breakers and relays with the electric utility company's system, and obtain electric utility company approval for sizes and settings of these devices.

D. Conductor ampacities specified or shown on the drawings are based on copper conductors, with the conduit and raceways sized per CEC. Aluminum conductors are prohibited.

1.2 MINIMUM REQUIREMENTS

A. The latest California Building Code (CBC), Underwriters Laboratories, Inc. (UL), Institute of Electrical and Electronics Engineers (IEEE), National Fire Protection Association (NFPA), California Electric Code (CEC) and standards are the minimum requirements for materials and installation.

B. The drawings and specifications shall govern in those instances where requirements are greater than those stated in the above codes and standards.

1.3 TEST STANDARDS

A. All materials and equipment shall be listed, labeled, or certified by a Nationally Recognized Testing Laboratory (NRTL) to meet Underwriters Laboratories, Inc. (UL), standards where test standards have been established. Materials and equipment which are not covered by UL standards will be accepted, providing that materials and equipment are listed, labeled, certified

or otherwise determined to meet the safety requirements of a NRTL. Materials and equipment which no NRTL accepts, certifies, lists, labels, or determines to be safe, will be considered if inspected or tested in accordance with national industrial standards, such as ANSI, NEMA, and NETA. Evidence of compliance shall include certified test reports and definitive shop drawings.

B. Definitions:
   1. Listed: Materials and equipment included in a list published by an organization that is acceptable to the Authority Having Jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production or listed materials and equipment or periodic evaluation of services, and whose listing states that the materials and equipment either meets appropriate designated standards or has been tested and found suitable for a specified purpose.
   2. Labeled: Materials and equipment to which has been attached a label, symbol, or other identifying mark of an organization that is acceptable to the Authority Having Jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of labeled materials and equipment, and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.
   3. Certified: Materials and equipment which:
      a. Have been tested and found by a NRTL to meet nationally recognized standards or to be safe for use in a specified manner.
      b. Are periodically inspected by a NRTL.
      c. Bear a label, tag, or other record of certification.
   4. Nationally Recognized Testing Laboratory: Testing laboratory which is recognized and approved by the Secretary of Labor in accordance with OSHA regulations.

1.4 QUALIFICATIONS (PRODUCTS AND SERVICES)

A. Manufacturer’s Qualifications: The manufacturer shall regularly and currently produce, as one of the manufacturer's principal products, the materials and equipment specified for this project, and shall have manufactured the materials and equipment for at least three years.

B. Product Qualification:

1. Manufacturer's materials and equipment shall have been in satisfactory operation, on three installations of similar size and type as this project, for at least three years.
2. The District reserves the right to require the Contractor to submit a list of installations where the materials and equipment have been in operation before approval.

C. Service Qualifications: There shall be a permanent service organization maintained or trained by the manufacturer which will render satisfactory service to this installation within eight hours of receipt of notification that service is needed. Submit name and address of service organizations.

1.5 APPLICABLE PUBLICATIONS

A. Applicable publications listed in all Sections of Division 26 shall be the latest issue, unless otherwise noted.

B. Products specified in all sections of Division 26 shall comply with the applicable publications listed in each section.

1.6 MANUFACTURED PRODUCTS

A. Materials and equipment furnished shall be of current production by manufacturers regularly engaged in the manufacture of such items, and for which replacement parts shall be available. Materials and equipment furnished shall be new, and shall have superior quality and freshness.

B. When more than one unit of the same class or type of materials and equipment is required, such units shall be the product of a single manufacturer.

C. Equipment Assemblies and Components:
1. Components of an assembled unit need not be products of the same manufacturer.
2. Manufacturers of equipment assemblies, which include components made by others, shall assume complete responsibility for the final assembled unit.
3. Components shall be compatible with each other and with the total assembly for the intended service.
4. Constituent parts which are similar shall be the product of a single manufacturer.

D. Factory wiring and terminals shall be identified on the equipment being furnished and on all wiring diagrams.

E. When Factory Tests are specified, Factory Tests shall be performed in the factory by the equipment manufacturer. In addition, the following requirements shall be complied with:
   1. When factory tests are successful, contractor shall furnish four (4) copies of the equipment manufacturer's certified test reports to EOR fourteen (14) days prior to shipment of the equipment, and not more than ninety (90) days after completion of the factory tests.
   2. When factory tests are not successful, factory tests shall be repeated in the factory by the equipment manufacturer. The Contractor shall be liable for all additional expenses for the EOR to witness factory re-testing.

1.8 MATERIALS AND EQUIPMENT PROTECTION

A. Materials and equipment shall be protected during shipment and storage against physical damage, vermin, dirt, corrosive substances, fumes, moisture, cold and rain.
   1. Store materials and equipment indoors in clean dry space with uniform temperature to prevent condensation.
   2. During installation, equipment shall be protected against entry of foreign matter, and be vacuum-cleaned both inside and outside before testing and operating. Compressed air shall not be used to clean equipment. Remove loose packing and flammable materials from inside equipment.
   3. Damaged equipment shall be repaired or replaced, as determined by the IOR.
   4. Painted surfaces shall be protected with factory installed removable heavy kraft paper, sheet vinyl or equal.
   5. Damaged paint on equipment shall be refinished with the same quality of paint and workmanship as used by the manufacturer so repaired areas are not obvious.

1.9 WORK PERFORMANCE

A. All electrical work shall comply with requirements of the latest CEC, NFPA 70B, NFPA 70E, NFPA 99, NFPA 110, OSHA Part 1910 subpart J – General Environmental Controls, OSHA Part 1910 subpart K – Medical and First Aid, and OSHA Part 1910 subpart S – Electrical, in addition to other references required by contract.
B. Job site safety and worker safety is the responsibility of the Contractor.

C. Electrical work shall be accomplished with all affected circuits or equipment de-energized. However, energized electrical work may be performed only for the non-destructive and non-invasive diagnostic testing(s), or when scheduled outage poses an imminent hazard to patient care, safety, or physical security. In such case, all aspects of energized electrical work, such as the availability of appropriate/correct personal protective equipment (PPE) and the use of PPE, shall comply with the latest NFPA 70E, as well as the following requirements:

1. Only Qualified Person(s) shall perform energized electrical work. Supervisor of Qualified Person(s) shall witness the work of its entirety to ensure compliance with safety requirements and approved work plan.
2. At least two weeks before initiating any energized electrical work, the Contractor and the Qualified Person(s) who is designated to perform the work shall visually inspect, verify and confirm that the work area and electrical equipment can safely accommodate the work involved.
3. At least two weeks before initiating any energized electrical work, the Contractor shall develop and submit a job specific work plan, and energized electrical work request to EOR and IOR. At the minimum, the work plan must include relevant information such as proposed work schedule, area of work, description of work, name(s) of Supervisor and Qualified Person(s) performing the work, equipment to be used, procedures to be used on and near the live electrical equipment, barriers to be installed, safety equipment to be used, and exit pathways.
4. Energized electrical work shall begin only after the Contractor has obtained written approval of the work plan, and the energized electrical work request from IOR and utility inspector. The Contractor shall make these approved documents present and available at the time and place of energized electrical work.
5. Energized electrical work shall begin only after the Contractor has invited and received acknowledgment from IOR and utility inspector to witness the work.

D. For work that affects existing electrical systems, arrange, phase and perform work to assure minimal interference with normal functioning of the facility. Refer to Article OPERATIONS AND STORAGE AREAS under Section 01 00 00, GENERAL REQUIREMENTS.

E. New work shall be installed and connected to existing work neatly, safely and professionally. Disturbed or damaged work shall be replaced or repaired to its prior conditions, as required by Section 01 00 00, GENERAL REQUIREMENTS.

F. Coordinate location of equipment and conduit with other trades to minimize interference.

1.10 EQUIPMENT INSTALLATION AND REQUIREMENTS

A. Equipment location shall be as close as practical to locations shown on the drawings.

B. Working clearances shall not be less than specified in the CEC.

C. Inaccessible Equipment:

1. Where the Government determines that the Contractor has installed equipment not readily accessible for operation and maintenance, the equipment shall be removed and reinstalled as directed at no additional cost to the Government.
2. "Readily accessible" is defined as being capable of being reached quickly for operation, maintenance, or inspections without the use of ladders, or without climbing or crawling under or over obstacles such as, but not limited to, motors, pumps, belt guards, transformers, piping, ductwork, conduit and raceways.

D. Electrical service entrance equipment and arrangements for temporary and permanent connections to the electric utility company's system shall conform to the electric utility company's requirements. Coordinate fuses, circuit breakers and relays with the electric utility company's system, and obtain electric utility company approval for sizes and settings of these devices.

1.11 EQUIPMENT IDENTIFICATION

A. In addition to the requirements of the CEC, install an identification sign which clearly indicates information required for use and maintenance of items such as switchboards and switchgear, panelboards, cabinets, motor controllers, fused and non-fused safety switches, generators, automatic transfer switches, separately enclosed circuit breakers, individual breakers and controllers in switchboards, switchgear and motor control assemblies, control devices and other significant equipment.

B. Identification signs for Normal Power System equipment shall be laminated black phenolic resin with a white core with engraved lettering. Identification signs for Essential Electrical System (EES) equipment, as defined in the CEC, shall be laminated red phenolic resin with a white core with engraved lettering. Lettering shall be a minimum of 12 mm (1/2 inch) high. Identification signs shall indicate equipment designation, rated bus amperage, voltage, number of phases, number of wires, and type of EES power branch as applicable. Secure nameplates with screws.

C. Install adhesive arc flash warning labels on all equipment as required by the latest NFPA 70E. Label shall show specific and correct information for specific equipment based on its arc flash calculations. Label shall show the followings:

1. Nominal system voltage.
2. Equipment/bus name, date prepared, and manufacturer name and address.
3. Arc flash boundary.
4. Available arc flash incident energy and the corresponding working distance.
5. Minimum arc rating of clothing.
6. Site-specific level of PPE.

1.12 SUBMITTALS

A. Submit to EOR in accordance with Section 01 33 00, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES.

B. The EOR's approval shall be obtained for all materials and equipment before delivery to the job site. Delivery, storage or installation of materials and equipment which has not had prior approval will not be permitted.

C. All submittals shall include six copies of adequate descriptive literature, catalog cuts, shop drawings, test reports, certifications, samples, and other data necessary for the EOR to ascertain that the proposed materials and equipment comply with drawing and specification requirements. Catalog cuts submitted for approval shall be legible and clearly identify specific materials and equipment being submitted.

D. Submittals for individual systems and equipment assemblies which consist of more than one item or component shall be made for the system or assembly as a whole. Partial submittals will not be considered for approval.

1. Mark the submittals, "SUBMITTED UNDER SECTION 01 25 00".
2. Submittals shall be marked to show specification reference including the section and paragraph numbers.
3. Submit each section separately.

E. The submittals shall include the following:
1. Information that confirms compliance with contract requirements. Include the manufacturer's name, model or catalog numbers, catalog information, technical data sheets, shop drawings, manuals, pictures, nameplate data, and test reports as required.
2. Submittals are required for all equipment anchors and supports. Submittals shall include weights, dimensions, center of gravity, standard connections, manufacturer's recommendations and behavior problems (e.g., vibration, thermal expansion, etc.) associated with equipment or piping so that the proposed installation can be properly reviewed. Include sufficient fabrication information so that appropriate mounting and securing provisions may be designed and attached to the equipment.
3. Elementary and interconnection wiring diagrams for communication and signal systems, control systems, and equipment assemblies. All terminal points and wiring shall be identified on wiring diagrams.
4. Parts list which shall include information for replacement parts and ordering instructions, as recommended by the equipment manufacturer.

F. Maintenance and Operation Manuals:
1. Submit as required for systems and equipment specified in the technical sections. Furnish in hardcover binders or an approved equivalent.
2. Inscribe the following identification on the cover: the words "MAINTENANCE AND OPERATION MANUAL," the name and location of the system, material, equipment, building, name of Contractor, and contract name and number. Include in the manual the names, addresses, and telephone numbers of each subcontractor installing the system or equipment and the local representatives for the material or equipment.
3. Provide a table of contents and assemble the manual to conform to the table of contents, with tab sheets placed before instructions covering the subject. The instructions shall be legible and easily read, with large sheets of drawings folded in.

4. The manuals shall include:
    a. Internal and interconnecting wiring and control diagrams with data to explain detailed operation and control of the equipment.
    b. A control sequence describing start-up, operation, and shutdown.
    c. Description of the function of each principal item of equipment.
    d. Installation instructions.
    e. Safety precautions for operation and maintenance.
    f. Diagrams and illustrations.
    g. Periodic maintenance and testing procedures and frequencies, including replacement parts numbers.
    h. Performance data.
    i. Pictorial "exploded" parts list with part numbers. Emphasis shall be placed on the use of special tools and instruments. The list shall indicate sources of supply, recommended spare and replacement parts, and name of servicing organization.
    j. List of factory approved or qualified permanent servicing organizations for equipment repair and periodic testing and maintenance, including addresses and factory certification qualifications.

G. Approvals will be based on complete submission of shop drawings, manuals, test reports, certifications, and samples as applicable.

H. After approval and prior to installation, furnish the //Resident Engineer// //COR// with one sample of each of the following:
    1. A minimum 300 mm (12 inches) length of each type and size of wire and cable along with the tag from the coils or reels from which the sample was taken. The length of the sample shall be sufficient to show all markings provided by the manufacturer.
    2. Each type of conduit coupling, bushing, and termination fitting.
    3. Conduit hangers, clamps, and supports.
    4. Duct sealing compound.
    5. Each type of receptacle, toggle switch, lighting control sensor, outlet box, manual motor starter, device wall plate, engraved nameplate, wire and cable splicing and terminating material, and branch circuit single pole molded case circuit breaker.

1.13 SINGULAR NUMBER

A. Where any device or part of equipment is referred to in these specifications in the singular number (e.g., "the switch"), this reference shall be deemed to apply to as many such devices as are required to complete the installation as shown on the drawings.

1.14 ACCEPTANCE CHECKS AND TESTS

A. The Contractor shall furnish the instruments, materials, and labor for tests.

B. Where systems are comprised of components specified in more than one section of Division 26, the Contractor shall coordinate the installation, testing, and adjustment of all components between various manufacturer's representatives and technicians so that a complete, functional, and operational system is delivered to the District.

C. When test results indicate any defects, the Contractor shall repair or replace the defective materials or equipment, and repeat the tests for the equipment. Repair, replacement, and re-testing shall be accomplished at no additional cost to the District.

1.16 WARRANTY

A. All work performed and all equipment and material furnished under this Division shall be free from defects and shall remain so for a period of one year from the date of acceptance of the entire installation by the Contracting Officer for the District.

1.17 INSTRUCTION

A. Instruction to designated Government personnel shall be provided for the particular equipment or system as required in each associated technical specification section.

B. Furnish the services of competent and factory-trained instructors to give full instruction in the adjustment, operation, and maintenance of the specified equipment and system, including pertinent safety requirements. Instructors shall be thoroughly familiar with all aspects of the installation, and shall be factory-trained in operating theory as well as practical operation and maintenance procedures.

C. A training schedule shall be developed and submitted by the Contractor and approved by the District at least 30 days prior to the planned training.

END OF SECTION

SECTION 26 05 19

LOW VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLE

PART 1 – GENERAL

1.1 SUMMARY

A. This Section includes building wires and cables and associated connectors, splices, and terminations for wiring systems rated 600 V and less.

1.2 SUBMITTALS

A. Section 013300 – Submittal Procedures.

B. Field quality-control test reports.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in CEC, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with CEC.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:
   1. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

2.2 CONDUCTORS AND CABLES

A. Manufacturers:
   1. American Insulated Wire Corp.; a Leviton Company.
   2. General Cable Corporation.
   3. Southwire Company.

B. Refer to Part 3 "Conductor and Insulation Applications" Article for insulation type, cable construction and ratings.

C. Conductor Material: Copper complying with NEMA WC 5 or 7; solid conductor for No. 10 AWG and smaller, stranded for No. 8 AWG and larger.

D. Conductor Insulation Types: Type THW, THHN-THWN2 or XHHW2 complying with NEMA WC 5 or 7.

E. Multiconductor Cable: Metal-clad cable, Type MC with ground wire. MC shall not be used unless approved prior to installation by the school district.

2.3 CONNECTORS AND SPLICES

A. Manufacturers:
1. AFC Cable Systems, Inc.
2. AMP Incorporated/Tyco International.
3. Hubbell/Anderson.
4. O-Z/Gedney; EGS Electrical Group LLC.
5. 3M Company; Electrical Products Division.

B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

PART 3 - EXECUTION

3.1 CONDUCTOR AND INSULATION APPLICATIONS

A. Service Entrance: Type XHHW-2, single conductors in raceway.

B. Exposed Feeders: Type THWN-2, single conductors in raceway.

C. Feeders Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN2, single conductors in raceway.

D. Feeders Concealed in Concrete, below Slabs-on-Grade, and in Crawlspaces: Type XHHW-2, single conductors in raceway.

E. Exposed Branch Circuits, including in Crawlspaces: Type THHN-THWN 2, single conductors in raceway.

F. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN, single conductors in raceway. Metal-clad cable, Type MC shall not be used without notice of approval from the school district.

G. Branch Circuits Concealed in Concrete and below Slabs-on-Grade: Type THHN-THWN2, single conductors in raceway.

H. Cord Drops and Portable Appliance Connections: Type SO, hard service cord.

I. Class 1 Control Circuits: Type THHN-THWN, in raceway.

J. Class 2 Control Circuits: Type THHN-THWN, in raceway.

3.2 INSTALLATION

A. Conceal cables in finished walls, ceilings, and floors, unless otherwise indicated.

B. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

C. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips that will not damage cables or raceway.

D. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

E. Support cables according to Section 260500 "Common Work Results for Electrical."

F. Identify and color-code conductors and cables according to Section 260500 “Common Work Results for Electrical."

G. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

H. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches of slack.

3.3 FIELD QUALITY CONTROL

A. Testing: Perform each electrical test and visual and mechanical inspection stated in NETA ATS, Section 7.3.1. Certify compliance with test parameters.

B. Test Reports: Prepare a written report to record the following:
   1. Test procedures used.
   2. Test results that comply with requirements.
   3. Test results that do not comply with requirements and corrective action taken to achieve compliance with requirements.

END OF SECTION

SECTION 26 05 26

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes grounding of electrical systems and equipment. Requirements specified in this Section may be supplemented by requirements of other Sections.

1.2 SUBMITTALS

A. Section 013300 – Submittal Procedures.

B. Product Data: For ground rods.
1. Field quality-control test reports.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled under UL 467 as defined in CEC, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1.4 GROUNDING ELECTRODE SYSTEM

A. Metal underground water pipe.

B. Metal frame of the building.

C. Concrete-encased electrode.

D. Rod electrode.

1.5 PERFORAMNCE REQUIREMENTS

A. Grounding System Resistance: 5 ohms.

1.6 SUBMITTALS

A. Section 013300 – Submittal Procedures.

B. Product Data: Provide data for grounding electrodes and connections.

C. Test Reports: Indicate all resistance to ground and resistance of each electrode.

D. Manufacturer's Instructions: Include all instructions for storage, handling, protection, examination, preparation and installation of exothermic connectors.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Cadweld.
2. Thermoweld.
3. Copperweld Corp.
4. Dossert Corp.
5. Erico Inc.; Electrical Products Group.
6. Galvan Industries, Inc.
7. Harger Lightning Protection, Inc.
8. Hastings Fiber Glass Products, Inc.
9. ILSCO.
10. Kearney/Cooper Power Systems.
11. Korns, C. C. Co.; Division of Robroy Industries.
12. Lyncole XIT Grounding.
13. O-Z/Gedney Co.; a business of the EGS Electrical Group.
14. Burndy "Hyground" compression system
15. Thomas & Betts, compression system

2.2 GROUNDING CONDUCTORS

A. For insulated conductors, comply with Section 260519 "Low-Voltage Power Conductors and Cables."

B. Equipment Grounding Conductors: Insulated with green-colored insulation.

C. Isolated Ground Conductors: Insulated with green-colored insulation with yellow stripe. On feeders with isolated ground, use colored tape, alternating bands of green and yellow tape to provide a minimum of three bands of green and two bands of yellow.

D. Grounding Electrode Conductors: Stranded cable.

E. Underground Conductors: Bare, tinned, stranded, unless otherwise indicated.

F. Bare, Solid-Copper Conductors: ASTM B 3.

G. Assembly of Bare, Stranded-Copper Conductors: ASTM B 8.

H. Bare, Tinned-Copper Conductors: ASTM B 33.

I. Copper Bonding Conductor: No. 4 or No. 6 AWG, stranded copper conductor.

J. Copper Bonding Jumper: Bare copper tape, braided bare copper conductors, terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

K. Tinned-Copper Bonding Jumper: Tinned-copper tape, braided copper conductors, terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

L. Grounding Bus: Bare, annealed copper bars of rectangular cross section, with insulated spacer.

M. Connectors: Comply with IEEE 837 and UL 467; listed for use for specific types, sizes, and combinations of conductors and connected items. Exothermic-welded type, in kit form, selected per manufacturer's written instructions.

N. Foundation Electrode: 4/0 AWG.

2.3 ROD ELECTRODES

A. Ground Rods: Copper-clad steel.
   1. Size: 3/4 inch diameter by 120 inches.
   2. Manufacturer: Blackburn; Eritech; Or equal.

2.4 GROUNDING WELL COMPONENTS

A. Well Pipe: 12 inch diameter by 24 inches long concrete pipe with belled end.

B. Well Cover: Cast iron with legend 'GROUND" embossed cover.

PART 3 - EXECUTION

3.1 INSTALLATION

A. All grounding shall be in accordance with CEC Article 250.

B. Use only copper conductors for both insulated and bare grounding conductors in direct contact with earth, concrete, masonry, crushed stone and similar materials.

C. In raceways, use insulated equipment grounding conductors.

D. Exothermic-Welded Connections: Use for connections to structural steel and for underground connections.

E. Grounding Bus: Install in electrical and telephone equipment rooms, in rooms housing service equipment, and elsewhere as indicated.
   1. Use insulated spacer; space 1 inch from wall and support from wall 6 inches above finished floor, unless otherwise indicated.

F. Equipment Grounding Conductors: Comply with CEC, Article 250, for types, sizes, and quantities of equipment grounding conductors, unless specific types, larger sizes, or more conductors than required by CEC are indicated.
   1. Install insulated equipment grounding conductors in feeders.
   2. Isolated Grounding Receptacle Circuits: Install an insulated equipment grounding conductor connected to the receptacle grounding terminal. Isolate grounding conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service, unless otherwise indicated.
   3. Nonmetallic Raceways: Install an equipment grounding conductor in nonmetallic raceways unless they are designated for telephone or data cables.
   4. Signal and Communication Systems: For telephone, alarm, voice and data, and other communication systems, provide No. 4 AWG minimum insulated grounding conductor in raceway from grounding electrode system to each service location, terminal cabinet, wiring closet, and central equipment location.
      a. Service and Central Equipment Locations and Wiring Closets: Terminate grounding conductor on a 1/4-by-2-by-12-inch grounding bus.
      b. Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal.

G. Ground Rods: Install at least three rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes.
   1. Drive ground rods until tops are 2 inches below finished floor or final grade, unless otherwise indicated.
   2. Interconnect ground rods with grounding electrode conductors. Use exothermic welds, except as otherwise indicated. Make connections without exposing steel or damaging copper coating.

H. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

I. Bonding Straps and Jumpers: Install so vibration by equipment mounted on vibration isolation hangers or supports is not transmitted to rigidly mounted equipment. Use exothermic-welded connectors for outdoor locations, unless a disconnect-type connection is required; then, use a bolted clamp. Bond straps directly to the basic

structure taking care not to penetrate any adjacent parts. Install straps only in locations accessible for maintenance.

J. Connections: Make connections so galvanic action or electrolysis possibility is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.
   1. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer to order of galvanic series.
   2. Make connections with clean, bare metal at points of contact.
   3. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.
   4. Make aluminum-to-galvanized steel connections with tin-plated copper jumpers and mechanical clamps.
   5. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.
   6. Exothermic-Welded Connections: Comply with manufacturer's written instructions. Welds that are puffed up or that show convex surfaces indicating improper cleaning are not acceptable.
   7. Equipment Grounding Conductor Terminations: For No. 8 AWG and larger, use pressure-type grounding lugs. No. 10 AWG and smaller grounding conductors may be terminated with winged pressure-type connectors.
   8. Noncontact Metal Raceway Terminations: If metallic raceways terminate at metal housings without mechanical and electrical connection to housing, terminate each conduit with a grounding bushing. Connect grounding bushings with a bare grounding conductor to grounding bus or terminal in housing. Bond electrically noncontinuous conduits at entrances and exits with grounding bushings and bare grounding conductors, unless otherwise indicated.
   9. Tighten screws and bolts for grounding and bonding connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A.
   10. Compression-Type Connections: Use hydraulic compression tools to provide correct circumferential pressure for compression connectors. Use tools and dies recommended by connector manufacturer. Provide embossing die code or other standard method to make a visible indication that a connector has been adequately compressed on grounding conductor.
   11. Moisture Protection: If insulated grounding conductors are connected to ground rods or grounding buses, insulate entire area of connection and seal against moisture penetration of insulation and cable.

K. Manholes and Handholes: Install a driven ground rod close to wall and set rod depth so 4 inches will extend above finished floor. If necessary, install ground rod before manhole is placed and provide a No. 1/0 AWG bare, tinned-copper conductor from ground rod into manhole through a waterproof sleeve in manhole wall. Protect ground rods passing through concrete floor with a double wrapping of pressure-sensitive tape or heat-shrunk

insulating sleeve from 2 inches above to 6 inches below concrete. Seal floor opening with waterproof, nonshrink grout.

L. Connections to Manhole Components: Connect exposed-metal parts, such as inserts, cable racks, pulling irons, ladders, and cable shields within each manhole or handhole, to ground rod or grounding conductor. Make connections with No. 4 AWG minimum, stranded, hard-drawn copper conductor. Train conductors level or plumb around corners and fasten to manhole walls. Connect to cable armor and cable shields as recommended by manufacturer of splicing and termination kits.

3.2 FIELD QUALITY CONTROL

A. Testing: Perform the following field quality-control testing:
1. After installing grounding system but before permanent electrical circuitry has been energized, test for compliance with requirements.
2. Test completed grounding system at each location where a maximum ground-resistance level is indicated and at service disconnect enclosure grounding terminal. Measure ground resistance not less than two full days after the last trace of precipitation, and without the soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance. Perform tests, by the fall-of-potential method according to IEEE 81.
3. Provide drawings locating each ground rod, ground rod assembly, and other grounding electrodes. Identify each by letter in alphabetical order, and key to the record of tests and observations. Include the number of rods driven and their depth at each location and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results. Nominal maximum values are as follows:
   a. Equipment Rated 500 kVA and Less: 10 ohms.
   b. Equipment Rated 500 to 1000 kVA: 5 ohms.
   c. Equipment Rated More Than 1000 kVA: 3 ohms.
   d. Manhole Grounds: 10 ohms.

END OF SECTION

SECTION 26 05 29

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Conduit supports.
2. Formed steel channel.
3. Spring steel clips.
4. Sleeves.
5. Mechanical sleeve seals.
6. Firestopping relating to electrical work.
7. Firestopping accessories.
8. Equipment bases and supports.

1.2 REFERENCES

A. ASTM International:
1. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
2. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
3. ASTM E814 - Standard Test Method for Fire Tests of Through-Penetration Fire Stops.
4. ASTM E1966 - Standard Test Method for Fire-Resistive Joint Systems.

B. FM Global:
1. FM - Approval Guide, A Guide to Equipment, Materials & Services Approved By Factory Mutual Research For Property Conservation.

C. California Electrical Code:
1. California Electrical Code 2025 Edition.

D. Underwriters Laboratories Inc.:
1. UL 263 - Fire Tests of Building Construction and Materials.
2. UL 723 - Tests for Surface Burning Characteristics of Building Materials.
3. UL 1479 - Fire Tests of Through-Penetration Firestops.
4. UL 2079 - Tests for Fire Resistance of Building Joint Systems.
5. UL - Fire Resistance Directory.

E. Intertek Testing Services (Warnock Hersey Listed):

1. WH - Certification Listings.

1.3 DEFINITIONS

A. Firestopping (Through-Penetration Protection System): Sealing or stuffing material or assembly placed in spaces between and penetrations through building materials to arrest movement of fire, smoke, heat, and hot gases through fire rated construction.

1.4 SYSTEM DESCRIPTION

A. Firestopping Materials: ASTM E119 to achieve fire ratings as noted on Drawings for adjacent construction, but not less than 1 hour fire rating.
   1. Ratings may be 3-hours for firestopping in through-penetrations of 4-hour fire rated assemblies unless otherwise required by applicable codes.

B. Surface Burning: ASTM E84 with maximum flame spread / smoke developed rating of 25/450.

C. Firestop interruptions to fire rated assemblies, materials, and components.

1.5 PERFORMANCE REQUIREMENTS

A. Firestopping: Conform to applicable code for fire resistance ratings and surface burning characteristics.

B. Firestopping: Provide certificate of compliance from authority having jurisdiction indicating approval of materials used.

1.6 SUBMITTALS

A. Section 013300 - Requirements for submittals.

B. Shop Drawings: Indicate system layout with location and detail of trapeze hangers.

C. Product Data:
   1. Hangers and Supports: Submit manufacturers catalog data including load capacity.
   2. Firestopping: Submit data on product characteristics, performance and limitation criteria.

D. Firestopping Schedule: Submit schedule of opening locations and sizes, penetrating items, and required listed design numbers to seal openings to maintain fire resistance rating of adjacent assembly.

E. Design Data: Indicate load carrying capacity of trapeze hangers, hangers and supports.

F. Manufacturer's Installation Instructions:
   1. Hangers and Supports: Submit special procedures and assembly of components.
   2. Firestopping: Submit preparation and installation instructions.

G. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

H. Engineering Judgements: For conditions not covered by UL or WH listed designs, submit judgements by licensed professional engineer suitable for presentation to authority having jurisdiction for acceptance as meeting code fire protection requirements.

1.7 QUALITY ASSURANCE

A. Through Penetration Firestopping of Fire Rated Assemblies: UL 1479 or ASTM E814 with 0.10 inch water gage minimum positive pressure differential to achieve fire F-Ratings and temperature T-Ratings as indicated on Drawings, but not less than 1-hour.
   1. Wall Penetrations: Fire F-Ratings as indicated on Drawings, but not less than 1-hour.
   2. Floor and Roof Penetrations: Fire F-Ratings and temperature T-Ratings as indicated on Drawings, but not less than 1-hour.
      a. Floor Penetrations within Wall Cavities: T-Rating is not required.

B. Through Penetration Firestopping of Non-Fire Rated Floor and Roof Assemblies: Materials to resist free passage of flame and products of combustion.
   1. Noncombustible Penetrating Items: Noncombustible materials for penetrating items connecting maximum of three stories.
   2. Penetrating Items: Materials approved by authorities having jurisdiction for penetrating items connecting maximum of two stories.

C. Fire Resistant Joints in Fire Rated Floor, Roof, and Wall Assemblies: ASTM E1966 or UL 2079 to achieve fire resistant rating as indicated on Drawings for assembly in which joint is installed.

D. Fire Resistant Joints between Floor Slabs and Exterior Walls: ASTM E119 with 0.10 inch water gage minimum positive pressure differential to achieve fire resistant rating as indicated on Drawings for floor assembly.

E. Surface Burning Characteristics: 25/450 flame spread/smoke developed index when tested in accordance with ASTM E84.

F. Perform Work in accordance with State Public Work's standard.

G. Maintain one copy of each document on site.

1.8 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.

B. Installer: Company specializing in performing work of this section with minimum 5 years documented experience.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Accept materials on site in original factory packaging, labeled with manufacturer's identification.

C. Protect from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original packaging.

1.10 ENVIRONMENTAL REQUIREMENTS

A. Section 016000 - Product Requirements: Environmental conditions affecting products on site.

B. Do not apply firestopping materials when temperature of substrate material and ambient air is below 60 degrees F.

C. Maintain this minimum temperature before, during, and for minimum 3 days after installation of firestopping materials.

D. Provide ventilation in areas to receive solvent cured materials.

PART 2 - PRODUCTS

2.1 CONDUIT SUPPORTS

A. Manufacturers:
1. Allied Tube & Conduit Corp.
2. Electroline Manufacturing Company.
3. O-Z Gedney Co.

B. Furnish materials in accordance with State Public Work's standards.

C. Hanger Rods: Threaded high tensile strength galvanized carbon steel with free running threads.

D. Beam Clamps: Malleable Iron, with tapered hole in base and back to accept either bolt or hanger rod. Set screw: hardened steel.

E. Conduit clamps for trapeze hangers: Galvanized steel, notched to fit trapeze with single bolt to tighten.

F. Conduit clamps - general purpose: One hole malleable iron for surface mounted conduits.

G. Cable Ties: High strength nylon temperature rated to 185 degrees F. Self locking.

2.2 FORMED STEEL CHANNEL

A. Manufacturers:
1. Allied Tube & Conduit Corp.
2. B-Line Systems.
3. Midland Ross Corporation, Electrical Products Division.
4. Unistrut Corp.

B. Furnish materials in accordance with State Public Work's standards.

C. Product Description: Galvanized 12 gage thick steel. With holes 1-1/2 inches on center.

D. Product Description: Mounting hole and screw closure.

2.3 SLEEVES

A. Furnish materials in accordance with State Public Work's standards.

B. Fire-stopping Insulation: Glass fiber type, non-combustible.

2.4 MECHANICAL SLEEVE SEALS

A. Manufacturers:
1. Thunderline Link-Seal, Inc.
2. NMP Corporation

B. Furnish materials in accordance with State Public Work's standards.

C. Product Description: Modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill annular space between object and sleeve, connected with bolts and pressure plates causing rubber sealing elements to expand when tightened, providing watertight seal and electrical insulation.

2.5 FIRESTOPPING

A. Manufacturers:

1. Dow Corning Corp.
2. Fire Trak Corp.
3. Hilti Corp.
4. International Protective Coating Corp.
5. 3M fire Protection Products.
6. Specified Technology, Inc.

B. Furnish materials in accordance with State Public Work's standards.

C. Product Description: Different types of products by multiple manufacturers are acceptable as required to meet specified system description and performance requirements; provide only one type for each similar application.

1. Silicone Firestopping Elastomeric Firestopping: Single component silicone elastomeric compound and compatible silicone sealant.
2. Foam Firestopping Compounds: Single component foam compound.
3. Formulated Firestopping Compound of Incombustible Fibers: Formulated compound mixed with incombustible non-asbestos fibers.
4. Fiber Stuffing and Sealant Firestopping: Composite of mineral fiber stuffing insulation with silicone elastomer for smoke stopping.
5. Mechanical Firestopping Device with Fillers: Mechanical device with incombustible fillers and silicone elastomer, covered with sheet stainless steel jacket, joined with collars, penetration sealed with flanged stops.
6. Intumescent Firestopping: Intumescent putty compound which expands on exposure to surface heat gain.
7. Firestop Pillows: Formed mineral fiber pillows.

D. Color: Dark gray

2.6 FIRESTOPPING ACCESSORIES

A. Primer: Type recommended by firestopping manufacturer for specific substrate surfaces and suitable for required fire ratings.

B. Dam Material: Permanent:
1. Mineral fiberboard.
2. Mineral fiber matting.
3. Sheet metal.
4. Plywood or particle board.
5. Alumina silicate fire board.

C. Installation Accessories: Provide clips, collars, fasteners, temporary stops or dams, and other devices required to position and retain materials in place.

D. General:

1. Furnish UL listed products or products tested by independent testing laboratory.
2. Select products with rating not less than rating of wall or floor being penetrated.

E. Non-Rated Surfaces:
1. Stamped steel, chrome plated, hinged, split ring escutcheons or floor plates or ceiling plates for covering openings in occupied areas where conduit is exposed.
2. For exterior wall openings below grade, furnish modular mechanical type seal consisting of interlocking synthetic rubber links shaped to continuously fill annular space between conduit and cored opening or water-stop type wall sleeve.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify openings are ready to receive sleeves.

B. Verify openings are ready to receive firestopping.

3.2 PREPARATION

A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter affecting bond of firestopping material.

B. Remove incompatible materials affecting bond.

C. Install backing materials to arrest liquid material leakage.

D. Obtain permission from Architect/Engineer before using powder-actuated anchors.

E. Do not drill or cut structural members.

3.3 INSTALLATION - HANGERS AND SUPPORTS

A. Anchors and Fasteners:
1. Concrete Structural Elements: Provide precast inserts.
2. Steel Structural Elements: Provide beam clamps.
3. Concrete Surfaces: Provide self-drilling anchors and expansion anchors.
4. Hollow Masonry, Plaster, and Gypsum Board Partitions: Provide toggle bolts and hollow wall fasteners.
5. Solid Masonry Walls: Provide expansion anchors and preset inserts.
6. Sheet Metal: Provide sheet metal screws.
7. Wood Elements: Provide wood screws.

B. Inserts:

1. Install inserts for placement in concrete forms.
2. Install inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
3. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches.
4. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.
5. Where inserts are omitted, drill through concrete slab from below and provide through-bolt with recessed square steel plate and nut above slab.

C. Install conduit and raceway support and spacing in accordance with CEC.

D. Do not fasten supports to pipes, ducts, mechanical equipment, or conduit.

E. Install multiple conduit runs on common hangers.

F. Supports:
1. Fabricate supports from structural steel or formed steel channel. Install hexagon head bolts to present neat appearance with adequate strength and rigidity. Install spring lock washers under nuts.
2. Install surface mounted cabinets and panelboards with minimum of four anchors.
3. In wet and damp locations install steel channel supports to stand cabinets and panelboards 1 inch off wall.
4. Support vertical conduit at every other floor.

3.4 INSTALLATION - FIRESTOPPING

A. Install material at fire rated construction perimeters and openings containing penetrating sleeves, piping, ductwork, conduit and other items, requiring firestopping.

B. Apply primer where recommended by manufacturer for type of firestopping material and substrate involved, and as required for compliance with required fire ratings.

C. Apply firestopping material in sufficient thickness to achieve required fire and smoke rating, to uniform density and texture.

D. Compress fibered material to maximum 40 percent of its uncompressed size.

E. Fire Rated Surface:
1. Seal opening at floor, wall, partition, ceiling, and roof as follows:
   a. Install sleeve through opening and extending beyond minimum of 1 inch on both sides of building element.
   b. Size sleeve allowing minimum of 1 inch void between sleeve and building element.
   c. Pack void with backing material.
   d. Seal ends of sleeve with UL listed fire resistive silicone compound to meet fire rating of structure penetrated.

2. Where conduit penetrates fire rated surface, install firestopping product in accordance with manufacturer's instructions.

F. Non-Rated Surfaces:
1. Seal opening through non-fire rated wall, partition, floor, ceiling, and roof opening as follows:
a. Install sleeve through opening and extending beyond minimum of 1 inch on both sides of building element.
b. Size sleeve allowing minimum of 1-inch void between sleeve and building element.
c. Install type of firestopping material recommended by manufacturer.
2. Install escutcheons, floor plates or ceiling plates where conduit, penetrates non-fire rated surfaces in occupied spaces. Occupied spaces include rooms with finished ceilings and where penetration occurs below finished ceiling.
3. Exterior wall openings below grade: Assemble rubber links of mechanical seal to size of conduit and tighten in place, in accordance with manufacturer's instructions.
4. Interior partitions: Seal pipe penetrations at clean rooms, laboratories, spaces, computer rooms, telecommunication rooms and data rooms. Apply sealant to both sides of penetration to completely fill annular space between sleeve and conduit.

3.5 INSTALLATION - EQUIPMENT BASES AND SUPPORTS

A. Provide housekeeping pads of concrete, minimum 3-1/2 inches thick and extending 6 inches beyond supported equipment. Refer to Section 033000-Cast-In-Place Concrete.

B. Using templates furnished with equipment, install anchor bolts, and accessories for mounting and anchoring equipment.

C. Construct supports of steel members or formed steel channel. Brace and fasten with flanges bolted to structure.

3.6 INSTALLATION - SLEEVES

A. Exterior watertight entries: Seal with adjustable interlocking rubber links.

B. Conduit penetrations not required to be watertight: Sleeve and fill with silicon foam.

C. Set sleeves in position in forms. Provide reinforcing around sleeves.

D. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.

E. Extend sleeves through floors 1inch above finished floor level. Caulk sleeves.

F. Where conduit or raceway penetrates floor, ceiling, or wall, close off space between conduit or raceway and adjacent work with fire stopping insulation and caulk. Provide close fitting metal collar or escutcheon covers at both sides of penetration.

G. Install chrome plated steel stainless steel escutcheons at finished surfaces.

3.7 FIELD QUALITY CONTROL

A. Section 01 41 00 and 01 45 33- Quality Requirements. Code-required special inspections and procedures.

B. Inspect installed firestopping for compliance with specifications and submitted schedule.

3.8 CLEANING

A. Section 01 70 00 - Execution and Closeout Procedures.

B. Clean adjacent surfaces of firestopping materials.

3.9 PROTECTION OF FINISHED WORK

A. Section 01 70 00 - Execution and Closeout Procedures.

B. Protect adjacent surfaces from damage by material installation.

END OF SECTION

SECTION 26 05 33

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1- GENERAL

1.1 SUMMARY

A. This Section includes raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.

1.2 SUBMITTALS

A. Section 013300 – Submittal Procedures.

B. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets indicated.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in CEC, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with CEC.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:
   1. Manufacturers: Subject to compliance with requirements, provide products by the manufacturer's specified.

2.2 METAL CONDUIT AND TUBING

A. Manufacturers:
   1. AFC Cable Systems, Inc.
   2. Alflex Inc.
   3. Anamet Electrical, Inc.; Anaconda Metal Hose.
   4. Electri-Flex Co.
   5. Grinnell Co./Tyco International; Allied Tube and Conduit Div.

6. LTV Steel Tubular Products Company.
7. Manhattan/CDT/Cole-Flex.
8. O-Z Gedney; Unit of General Signal.
9. Wheatland Tube Co.

B. Rigid Steel Conduit: ANSI C80.1.

C. Aluminum Rigid Conduit: ANSI C80.5.

D. IMC: ANSI C80.6.

E. EMT and Fittings: ANSI C80.3.
1. Fittings: Compression type.

F. FMC: Aluminum.

G. LFMC: Flexible steel conduit with PVC jacket.

H. Fittings: NEMA FB 1; compatible with conduit and tubing materials.

2.3 NONMETALLIC CONDUIT AND TUBING

A. Manufacturers:
1. American International.
2. Anamet Electrical, Inc.; Anaconda Metal Hose.
3. Arnco Corp.
4. Cantex Inc.
5. Certainteed Corp.; Pipe & Plastics Group.
6. Condux International.
7. ElecSYS, Inc.
8. Electri-Flex Co.
9. Lamson & Sessions; Carlon Electrical Products.
10. Manhattan/CDT/Cole-Flex.
11. RACO; Division of Hubbell, Inc.
12. Spiralduct, Inc./AFC Cable Systems, Inc.
13. Thomas & Betts Corporation.

B. RNC: NEMA TC 2, Schedule 40 and Schedule 80 PVC.

C. RNC Fittings: NEMA TC 3; match to conduit or tubing type and material.

2.4 SURFACE RACEWAYS

A. Surface Metal Raceways: Galvanized steel with snap-on covers. Finish with manufacturer's standard prime coating.

1. Manufacturers:
    a. Airey-Thompson Sentinel Lighting; Wiremold Company (The).
    b. Thomas & Betts Corporation.
    c. Walker Systems, Inc.; Wiremold Company (The).
    d. Wiremold Company (The); Electrical Sales Division.

B. Types, sizes, and channels as indicated and required for each application, with fittings that match and mate with raceways.

2.5 BOXES, ENCLOSURES, AND CABINETS

A. Manufacturers:
1. Cooper Crouse-Hinds; Div. of Cooper Industries, Inc.
2. Emerson/General Signal; Appleton Electric Company.
3. Erickson Electrical Equipment Co.
4. Hoffman.
5. Hubbell, Inc.; Killark Electric Manufacturing Co.
6. O-Z/Gedney; Unit of General Signal.
7. RACO; Division of Hubbell, Inc.
8. Robroy Industries, Inc.; Enclosure Division.

B. Sheet Metal Outlet and Device Boxes: NEMA OS 1.
C. Cast-Metal Outlet and Device Boxes: NEMA FB 1, Type FD, with gasketed cover.
D. Nonmetallic Outlet and Device Boxes: NEMA OS 2.
E. Floor Boxes: Cast metal, fully adjustable, rectangular.
F. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
G. Cast-Metal Pull and Junction Boxes: NEMA FB 1, cast aluminum with gasketed cover.

H. Hinged-Cover Enclosures: NEMA 250, Type 1, with continuous hinge cover and flush latch.
1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.

I. Cabinets: NEMA 250, Type 1, galvanized steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel. Hinged door in front cover with flush latch and concealed hinge. Key latch to match panelboards. Include metal barriers to separate wiring of different systems and voltage and include accessory feet where required for freestanding equipment.

2.6 FACTORY FINISHES
A. Finish: For raceway, enclosures, or cabinet components, provide manufacturer's standard prime-coat finish ready for field painting.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

A. Outdoors:
   1. Exposed: Rigid steel or IMC.
   2. Concealed: Rigid steel or IMC.
   3. Underground, Single Run: RNC.
   4. Underground, Grouped: RNC.
   5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
   6. Boxes and Enclosures: NEMA 250, Type 3R.

B. Indoors:
   1. Exposed: EMT. Exposed conduit shall be approved by District prior to installation.
   2. Concealed: EMT.
   3. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC; except use LFMC in damp or wet locations.
   4. Damp or Wet Locations: Rigid steel conduit.
   5. Boxes and Enclosures: NEMA 250, Type 1, except as follows:
      a. Damp or Wet Locations: NEMA 250, Type 4, stainless steel.

C. Minimum Raceway Size: 1/2-inch trade size.

D. Raceway Fittings: Compatible with raceways and suitable for use and location.
   1. Intermediate Steel Conduit: Use threaded rigid steel conduit fittings, unless otherwise indicated.
   2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings approved for use with that material. Patch all nicks and scrapes in PVC coating after installing conduits.

E. Do not install aluminum conduits embedded in or in contact with concrete.

3.2 INSTALLATION

A. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.

B. Complete raceway installation before starting conductor installation.

C. Support raceways as specified in Section 260500 "Common Work Results For Electrical."

D. Install temporary closures to prevent foreign matter from entering raceways.

E. Protect stub-ups from damage where conduits rise through floor slabs. Arrange so curved portions of bends are not visible above finished slab.

F. Make bends and offsets so ID is not reduced. Keep legs of bends in same plane and keep straight legs of offsets parallel, unless otherwise indicated.

G. Conceal conduit and EMT within finished walls, ceilings, and floors, unless otherwise indicated.
   1. Install concealed raceways with a minimum of bends in shortest practical distance, considering type of building construction and obstructions, unless otherwise indicated.

H. Raceways Embedded in Slabs: Install in middle 1/3 of slab thickness where practical and leave at least 2 inches of concrete cover.
   1. Secure raceways to reinforcing rods to prevent sagging or shifting during concrete placement.
   2. Space raceways laterally to prevent voids in concrete.
   3. Run conduit larger than 1-inch trade size parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support.
   4. Change from nonmetallic tubing to Schedule 80 nonmetallic conduit, rigid steel conduit, or IMC before rising above floor.

I. Install exposed raceways parallel or at right angles to nearby surfaces or structural members and follow surface contours as much as possible.
   1. Run parallel or banked raceways together on common supports.
   2. Make parallel bends in parallel or banked runs. Use factory elbows only where elbows can be installed parallel; otherwise, provide field bends for parallel raceways.

J. Join raceways with fittings designed and approved for that purpose and make joints tight.
   1. Use insulating bushings to protect conductors on all raceways 2” and larger.

K. Tighten set screws of threadless fittings with suitable tools.

L. Terminations:
   1. Where raceways are terminated with locknuts and bushings, align raceways to enter squarely and install locknuts with dished part against box. Use two locknuts, one inside and one outside box.
   2. Where raceways are terminated with threaded hubs, screw raceways or fittings tightly into hub so end bears against wire protection shoulder. Where chase nipples are used, align raceways so coupling is square to box; tighten chase nipple so no threads are exposed.

M. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire.

N. Telephone and Signal System Raceways, 2-Inch Trade Size and Smaller: In addition to above requirements, install raceways in maximum lengths of 150 feet and with a maximum of two 90-degree bends or equivalent. Separate lengths with pull or junction boxes where necessary to comply with these requirements.

O. Install raceway sealing fittings at suitable, approved, and accessible locations and fill them with UL-listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:
   1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
   2. Where otherwise required by CEC.

P. Stub-up Connections: Extend conduits through concrete floor for connection to freestanding equipment. Install with an adjustable top or coupling threaded inside for plugs set flush with finished floor. Extend conductors to equipment with rigid steel conduit; FMC may be used 6 inches above the floor. Install screwdriver-operated, threaded plugs flush with floor for future equipment connections.

Q. Flexible Connections: Use maximum of 72 inches of flexible conduit for recessed and semi recessed lighting fixtures; for equipment subject to vibration, noise transmission, or movement; and for all motors. Use LFMC in damp or wet locations. Install separate ground conductor across flexible connections.

R. Surface Raceways: Install a separate, green, ground conductor in raceways from junction box supplying raceways to receptacle or fixture ground terminals.

S. Set floor boxes level and flush with finished floor surface.

T. Install hinged-cover enclosures and cabinets plumb. Support at each corner.

3.3 PROTECTION

A. Provide final protection and maintain conditions that ensure coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.
   1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
   2. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION

SECTION 26 09 43

DIGITAL NETWORK LIGHTING CONTROL DEVICES

PART 1 - GENERAL

1.1 SUMMARY

A. Installed system shall be comprised of stand-alone and networked control devices as indicated. System control devices shall include, but are not limited to:
   a. Digital Room Controllers
   b. UL924 Load Controller
   c. Fixture Control Modules
   d. Lighting Control Panels
   e. Sensors
   f. Wall Stations
   g. Network Area Controller
   h. Network Modules
   i. Network Accessories
   j. Software Interfaces
   k. Conductors and Cabling

1.2 SYSTEM DESCRIPTION

A. The contractor shall provide and install NX Lighting Controls System as shown on plans and specified herein. NX Lighting Controls System shall be designed and configured to send and receive control, monitoring, operating and maintenance signals and commands wired and or wirelessly to and from networked enabled room controllers, fixture modules, switch stations, occupancy and daylight sensors, lighting control panels and other controls devices.

1.3 SUBMITTALS

A. Prior to fabrication and shipment of lighting control components, manufacturer shall provide submittal documentation for approval.

B. Submittal documentation shall include:
   1. Bill of Material including a list of components to be supplied,
   2. Device specification sheets indicating device features, certifications, dimensions, construction specifications, electrical specifications, wiring diagrams, nomenclature, and related products,
   3. Component schedules: Indicating lighting control device types and locations
   4. Lighting panel schedules,

5. Wiring diagrams,
6. Control cable type and routing requirements,
7. System riser drawings of sufficient detail to indicate relative placement of major system components and the required connections between each,
8. Contractor Startup Request Form – to be completed prior to factory startup,
9. Operating and maintenance instructions, manuals and/or videos.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualification: Manufacturer of lighting control devices with minimum five years record of satisfactory manufacturing and support of components comparable to basis of design system.

1. Approval of Comparable Products: Submit the following at least 10 days prior to submission of a proposal package. Substitution submitted without the below shall be rejected.
   a. Submit line-by-line comparison that describes differences, if any, between each lighting control device specified and those being proposed. Comparison shall include differences in size, quantity, quality, method of control, features and functions, control software functions, and installation requirements.
   b. Product data, including certified independent test data indicating compliance with requirements.
   c. Samples of each component.
   d. Project references: Minimum of 3 installations not less than 3 years old, with Owner and Architect contact information.
   e. Sample warranty.

2. Substitutions following award of contract are not allowed except as stipulated in Division 01 General Requirements.

B. Factory Assembly: All system components shall arrive at the job site completely pre-wired and ready for installation, requiring only the connection of lighting circuits and network terminations. All connections shall be made to clearly and permanently labeled termination points or by connectorized cable. Systems that required field assembly shall not be acceptable.

C. Component Testing: All system components and assemblies shall be individually tested prior to assembly. Once assembled, all finished products shall be tested for proper operation of all control functions per specifications prior to shipment.

1.5 SYSTEM COMPLIANCE

A. Compliance: Where indicated, individual components shall comply with the following requirements:
   1. CEC Compliance: All system components shall comply with all applicable sections of the California Electrical Code (CEC).
   2. NEMA Compliance: All system components shall comply with all applicable portions of NEMA standards pertaining to types of electrical equipment and enclosures.
   3. UL Approval: All applicable equipment shall be tested to and listed under UL standard 508, UL standard 916 or UL924 and shall bare labels to indicate compliance. Lighting control relays shall be tested to UL standard 508 for both safety and endurance. Systems listed under ETL or other UL sections shall provide documentation proving compliance with UL standards as listed above.
   4. FCC Emissions: All applicable equipment shall comply with FCC emissions standards specified in Part 15, sub-part j for commercial and residential applications and shall bear labels indicating compliance testing. Equipment that does not meet these standards shall not be acceptable.

1.6 WARRANTY

A. Manufacturer shall warrant the lighting control system components to be free from defects in material and workmanship for a period of five (5) years from the date of the certificate of building occupancy or proof of installation, whichever occurs first ("Warranty Period"). If the certificate of building occupancy is not available or there is no proof of installation, the Warranty Period shall begin with the Product ship date.

B. Manufacturer's warranty shall include the repair or replacement product(s) with the same or a functionally equivalent product(s) or component part(s).

C. Manufacturer shall provide telephone technical support and remote diagnostics where applicable during normal business hours excluding manufacturer holidays.

D. Upon request, Manufacturer shall provide quotation for manufacturer service contract option(s) which include on-site technician visits for service and repair.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers
   1. Current

B. Basis-of-Design: NX Lighting Controls System manufactured by HLI Solutions, a division of Current, Greenville SC.

2.2 SYSTEM ARCHITECTURE

A. System shall consist of wired and/or wireless, distributed intelligent lighting control devices consisting of but not limited to control modules with ON/OFF, full range dimming and CCT control capabilities, and system input devices including but not limited to occupancy/vacancy sensors, daylight sensors and manual switch stations.

B. System shall provide for automatic self-configuration of system devices. Self-configuration shall be accomplished by the devices themselves and provide for control of lighting prior to system custom configuration and programming. Systems that require configuration prior to use shall be considered unacceptable.

C. To implement lighting control strategies, the system architecture shall facilitate the association of system input devices to control modules. The system shall use the Area/Zone/Group assignment strategy. The system shall support up to 128 Areas. Each area shall consist of up to 128 Zones and each zone shall consist of up to 16 Groups. Each device may be programmed to participate in one Area and Zone however may belong to one or more of the available 16 Groups within a Zone.

D. System shall provide time-of-day and astronomical clock scheduling. Each Area/Zone shall support up to 99 scheduled events for use in developing time-of-day or astronomical clock sunrise/sunset automated schedules. Each schedule shall have the ability to turn a group ON or OFF or activate a preset lighting scene at a scheduled time. Schedules shall be day-of-week selectable and may be programmed to activate on any combination of days of the week (Sunday through Saturday) or to activate on a specific date/holiday.

E. System shall support blink alerts. Relay outputs within the control modules shall be programmable to blink prior to being turned OFF. Blink alert duration time shall be adjustable. Control modules programmed for the blink alert function shall blink the controlled lighting prior to turning OFF to warn occupants of the upcoming OFF event. If an ON command is received during the blink alert time, relay output will be overridden and left ON for the override time. Override time shall be adjustable.

F. System input devices shall be deployed in a space to monitor and broadcast changes such as occupancy, daylight levels and manual switch input.

G. System customization and programming shall be performed from a mobile App and/or web-based configuration and system management tools.

H. System shall have an intuitive and easy to use Graphical User Interface (GUI) to configure, control, monitor and schedule individual devices or groups of devices.

I. System shall remain fully functional during the programming process. Lighting control systems that must be taken “OFFLINE” for programming are not acceptable. All programming changes shall take effect immediately as they are programmed.

J. System shall be capable of being accessed from a local network or remotely using any standard Internet browser. System shall not require any special client-side software. Systems which utilize special client-side software shall not be acceptable.

K. Systems devices shall be capable of communication with each over one or all of the below methods.
   1. RS485 multidrop serial network
   2. Wireless mesh network
   3. Ethernet TCIP network

L. Wired – RS485/Ethernet
   1. System shall provide an Ethernet communication backbone (NX Network) for the connection of control Zones.
   2. System shall utilize the RS485 standard for connection of and communications between Zone Devices.
   3. System shall utilize the RS485 standard for connection of and communications between SmartPORT™ devices (e.g., Sensors, Switches and Accessories) connected within a NX Zone.

M. Wireless – Coordinator-less, Self-Organizing/Self-Healing Mesh
   1. System shall have a wireless architecture that utilizes wireless mesh radio technology to create a peer-to-peer, self-organizing and self-healing mesh network infrastructure.
   2. System shall have no single point of failure. A master controller/coordinator or master node shall not be required for proper system operation. All nodes shall be capable of communicating with each other without the need of these types of single point of failure devices. Systems which utilize a master controller/coordinator shall not be acceptable.
   3. System shall be self-organizing. The mesh network of devices shall self-organize automatically without the need to manually set device addresses via dials, DIP switches or other means.
   4. System shall be self-healing. System devices within the mesh network shall automatically reroute messages around a failed device to ensure message delivery.

5. System architecture shall facilitate data transmission between wireless devices over the 2.4GHz ISM radio frequency (RF) band with a supported RF range of 100ft between wireless devices indoors and 300ft outdoors.
6. System shall use a wireless mesh radio communication protocol to transmit/receive and negotiate messaging among wireless devices.
7. System shall utilize spread spectrum frequency hopping to facilitate robust communication and prevent the unauthorized interception of messages over the air and to comply with FCC requirements.
8. System shall provide the ability to secure messages. When implemented, each device shall use the strong and secure AES-128 (Advanced Encryption Standard) security cipher to encrypt and decrypt messages. System shall also use the secure HTTPS/SSL protocol when users access the system using their Internet browser.

N. System devices shall be capable of having their firmware updated or upgraded over the air through the wireless mesh network.

2.3 DIGITAL ROOM CONTROLLERS

A. NX Room Controllers
1. Basis of Design Product: NX Lighting Controls System, NX Room Controllers.
2. As indicated and where shown on the plans, install NXRC series Room Controller(s) to control the quantity of lighting and plug loads required.
3. NX Room Controller(s) shall integrate the functionality of connected control components including wall switch stations, occupancy sensors and daylight sensors to provide the required sequence of operation for the space.
4. NX Room Controller(s) and associated room control components shall operate in a totally standalone mode and not require the use of a network, software, computer, or server for local control functions.
5. NX Room Controller(s) shall have an embedded Time Clock and be capable of storing and running up to 99 local schedules. Schedules shall run autonomously without the need of any coordinator, gateway, or master controller.
6. Construction:
    a. NX Room Controller housing shall be constructed of GSM UL rated 94 HB plastic approved for use in a return air plenum.
    b. The housing and shall include an integral 1/2" chase nipple for external mounting to standard junction box knockout.
    c. Two RJ45 FX Port connectors shall be accessible on the side of the enclosure for expansion of a Zone Segment to allow for an expanded number of Zone Segment devices (e.g., Room Controllers, In-Fixture Modules, and Digital Sensors). Up to 32 controllers and devices can be daisy-chained together.
    d. Two RJ45 SmartPORT™ connectors shall be accessible on the side of the enclosure for the connection of NX room level devices.

e. Two recessed push buttons and associated LED indicators shall be accessible on the top of the enclosure to provide override, status, setup, and testing functions.

7. Electrical:
   a. NX Room Controller(s) shall have a single power feed and shall be capable of operation at voltages between 120/277/347 volts AC, 50/60 Hz.
   b. One or two output relays (model specific) shall provide for the following load types and ampacity (per relay):
      1) 20A, Tungsten,
      2) 20A, Magnetic Ballast,
      3) 16A, Electronic Ballast,
      4) 1 H.P. Motor @ 120V, ¾ H.P. @ 277V; ½ H.P. @ 347V
   c. Where indicated provide one or two independent 0-10 volt dimming channels (model specific) for full range dimming control of fixtures equipped with compatible dimmable ballast or driver.
   d. Each dimming output shall have a current sinking capacity of at least 30 mA.
   e. NX Room Controller(s) shall be capable of supplying 250 mA of Class 2 auxiliary DC power for use by wall switch stations, occupancy sensors, and daylight sensors connected to the room controller's two RJ45 SmartPORT connectors.
   f. NX Room Controller(s) shall be equipped with power monitoring circuitry capable of measuring and reporting the total connected load for each room controller.
8. Functional:
   a. Provide an integral pushbutton and LED indicator for each load for status and to allow operation of the relays and dimmers for testing and verification without requiring other control devices to be connected.
   b. NX Room Controller(s) shall have a default operation providing an automatic logical sequence of operation for each load as the room control devices are plugged into the SmartPORT connectors.
   c. Default operation for occupancy sensors shall be automatic on, automatic off for all loads.
   d. Upon connection of a switch, the operation shall automatically change to manual on, automatic off (vacancy) mode for all loads.
   e. Provide capability to convert each load independently to automatic on or vacancy mode using only the integral push buttons and LED indicators on the room controller.
   f. When in vacancy mode, provide a 30 second grace period after an off during which automatic on shall be temporarily enabled.
   g. It shall be possible to connect up to thirty-two (32) room controllers together on the FX Ports using Cat5 patch cables to provide configurations up to 64 switched and dimmed loads operating as a single zone.

h. Provide the following set up and configuration functions without the need for additional devices or software:
    1) Assign/reassign relays for control by wall switch station buttons,
    2) Configure relays for occupancy or vacancy operation,
    3) Assign/reassign dimmers to raise/lower switches,
    4) Assign dimming channels for response to daylight sensor control,
    5) Auto calibrate default daylight sensor sequence of operation,
    6) Save preset scenes.

9. NX Room Controller(s) shall support the following specialty modes:
    a. SpectraSync™ CCT Control
        1) Dimmer channels can be set individually to control CCT via 0-10V.
        2) Scheduling can be implemented to mimic the natural transition of light throughout the course of the day.
        3) Room-based solutions can be implemented to allow occupants to tune color to task.
    b. SpectraClean™
        1) Ability to control SpectraClean enabled fixtures with three different modes for varying applications:
            a) Constant On
            b) Scheduled
            c) Programmed Dosage

2.4 UL924 LOAD CONTROLLER

A. NX UL924 Load Controller
1. Basis of Design Product: NX Lighting Controls System, NX UL924 Load Controller.
2. As indicated and where shown on the plans, install NX UL924 Load Controller to control the quantity of emergency lighting loads required.
3. NX UL924 Load Controller shall meet NFPA Article 700 requirements for emergency lighting.
4. NX UL924 Load Controller and associated room control components shall operate in a totally standalone mode and not require the use of a network, software, computer, or server for local control functions.
5. NX UL924 Load Controller shall provide a remote test button or fire alarm interface.
6. NX UL924 Load Controller shall have an embedded Time Clock and be capable of storing and running up to 99 local schedules. Schedules shall run autonomously without the need of any coordinator, gateway, or master controller.
7. Construction:
    a. NX UL924 Load Controller housing shall be constructed of GSM UL rated 94 HB plastic approved for use in a return air plenum.

b. The housing and shall include an integral 1/2" chase nipple for external mounting to standard junction box knockout.
c. Two RJ45 FX Port connectors shall be accessible on the side of the enclosure for expansion of a Zone Segment to allow for an expanded number of Zone Segment devices (e.g., Room Controllers, In-Fixture Modules, and Digital Sensors). Up to 32 controllers and devices can be daisy-chained together.
d. Two recessed push buttons and associated LED indicators shall be accessible on the top of the enclosure to provide override, status, setup, and testing functions.

8. Electrical:
   a. NX UL924 Load Controller shall have a single power feed and shall be capable of operation at voltages between 120/277/347 volts AC, 50/60 Hz.
   b. One relay output shall provide the following load types and ampacity:
      1) 20A, Tungsten,
      2) 20A, Magnetic Ballast,
      3) 16A, Electronic Ballast,
      4) 1 H.P. Motor @ 120V, ¾ H.P. @ 277V; ½ H.P. @ 347V.
   c. NX UL924 Load Controller shall provide two independent 0-10 volt dimming channels for full range dimming control of fixtures equipped with compatible dimmable ballast or driver.
   d. Each dimming output shall have a current sinking capacity of at least 30 mA.
   e. NX UL924 Load Controller shall be equipped with power monitoring circuitry capable of measuring and reporting the total connected load for each room controller.
9. Functional:
   a. SmartPORT Functionality:
      1) NX UL924 Load Controller shall automatically recognize connected devices in the Zone Segment.
      2) NX UL924 Load Controller shall function as a standard room controller.
      3) NX UL924 Load Controller's RJ45 CAT5 connection shall be used as a sensing line to standard room controller only and does not support NX room devices.
   b. Emergency Functionality:
      1) NX UL924 Load Controller's RJ45 CAT5 connection shall be used as a sensing line to standard room controller on normal circuit.
      2) Removal of 24VDC on CAT5 connection shall put NX UL924 Load Controller into emergency state.
      3) NX UL924 Load Controller's default emergency state is ON with both dimming channels to 100%
   c. Provide an integral pushbutton and LED indicator for controlled load for status and to allow operation of the relay and dimmers for testing and verification without requiring other control devices to be connected.

d. Provide the following set up and configuration functions without the need for additional devices or software:
    1) Assign/reassign relays for control by wall switch station buttons,
    2) Configure relays for occupancy or vacancy operation,
    3) Assign/reassign dimmers to raise/lower switches,
    4) Assign dimming channels for response to daylight sensor control,
    5) Save preset scenes.

10. NX UL924 Load Controller shall support the following specialty modes:
    a. SpectraSync™ CCT Control
        1) Dimmer channels can be set individually to control CCT via 0-10V.
        2) Scheduling can be implemented to mimic the natural transition of light throughout the course of the day.
        3) Room-based solutions can be implemented to allow occupants to tune color to task.
    b. SpectraClean™
        1) Ability to control SpectraClean enabled fixtures with three different modes for varying applications:
            a) Constant On
            b) Scheduled
            c) Programmed Dosage

2.5 FIXTURE MODULES

A. NX In-Fixture Modules
1. Basis of Design Product: NX Lighting Controls System, NX In-Fixture Modules.
2. As indicated in the specifications and as shown on the plans, install NXFM series Fixture Control Module enabled fixture(s).
3. NX In-Fixture Modules shall be designed to install inside the fixture they control.
4. NX In-Fixture Modules shall consist of a completely distributed intelligent lighting controller capable of functioning completely independently including time based and astronomical scheduling of On/Off and preset events without the need of any coordinator, gateway or master controller. Sensors and switches as well as other NX In-Fixture enabled fixtures shall be capable of being connected directly to the NX In-Fixture Module to create a fully functional lighting control system.
5. NX In-Fixture Module shall be provided with one SPST relay. Relay shall be supplied with “Zero Cross Switching” control to limit the effects of inrush on the relay contacts.
6. NX In-Fixture Module shall be compatible with incandescent, magnetic, and electronic lighting loads including LED drivers. NX In-Fixture Module shall include zero arc point switching circuitry and have the following max load ratings:
7. Construction:
    a. Housing: GSM UL Rated 94 HB Plastic

b. Mounting: Mounts inside fixture

8. Electrical:
   a. Line Voltage Versions:
      1) Input: Universal 120-347VAC, 50-60Hz
      2) Output: One or two relay outputs (model specific) shall provide for the following load types and ampacity (per relay):
         a) 10A, 120VAC only Incandescent
         b) 10A, 120-347VAC, Magnetic Ballast
         c) 5A, 120-277VAC, Electronic Ballast
         d) 3A, 347VAC, Electronic Ballast
      3) Surge Withstand: 2000V
      4) Peak Inrush: 160A for 2 ms Max
   b. Low Voltage Versions:
      1) Input: 12-24VDC
   c. NX In-Fixture Modules shall be provided with two 0-10VDC control interfaces for full range dimming control of dimming ballasts and LED drivers. Interface shall be designed to continuously sink 30mA of current.
   d. NX In-Fixture Module 0-10VDC control interfaces shall be configurable for 0-10VDC dimming, dim to off or color temperature control.

9. Functional:
   a. NX In-Fixture Modules shall be designed to self-configure, automatically to meet energy code requirements as NX sensors and other NX devices are connected.
   b. NX In-Fixture Module shall be designed such that self-configuration takes place automatically without user intervention or commissioning of any kind.
   c. NX In-Fixture Modules shall be rated and tested for an operating temperature range of -40° to 185°F [-40° to 85°C].
   d. NX In-Fixture Module shall be equipped with a Real Time Clock and integral backup for schedule information. Each module shall support up to 99 schedules. Schedules shall be loaded to the module via the network or locally using the NX Lighting Controls App. Once loaded, schedules shall run autonomously without the need of any coordinator, gateway, or master controller.
   e. NX In-Fixture Module shall be capable of having its device firmware updated wirelessly over the air when connected to a NX sensor of via the NX SmartPORT.
   f. NX In-Fixture Modules shall be supplied with one momentary pushbutton with LED for manual control and testing. Through the use of this switch, it shall be possible to test the On/Off and dimming functionality of the NX In-Fixture module or completely reset the NX In-Fixture Module to factory defaults without the need to connect any other device or testing equipment.

g. NX In-Fixture Module shall include non-volatile memory for retaining device settings during power outages.

10. NX In-Fixture Module shall be UL Listed to UL916 and Certified to CAN/CSA C22.2 NO 205-M1983.
11. NX In-Fixture Module shall be FCC certified.

B. NX On-Fixture Modules

1. Basis of Design Product: NX Lighting Controls System, NX On-Fixture Module.
2. As indicated in the specifications and as shown on the plans, install NXOFM series wireless On-Fixture Control Module(s).
3. NX On-Fixture modules shall consist of a completely self-contained distributed intelligent wireless lighting controller capable of functioning completely independently including time based and astronomical scheduling of On/Off and preset events without the need of any coordinator, gateway or master controller.
4. NX On-Fixture Module shall be configurable remotely over the air utilizing built in Bluetooth radio an iOS or Android handheld device with the NX Lighting Controls App installed or via NX Wireless Network.
5. NX On-Fixture Module shall be capable of having its device firmware updated wirelessly over utilizing it's built in Bluetooth radio and iOS or Android handheld device with the NX Lighting Controls App installed or via NX Wireless Network.
6. On-Fixture Module shall respond to scheduled events, occupancy/vacancy sensor events and manual switch station events.
7. On-Fixture Module shall monitor and measure energy consumption.
8. On-Fixture Module shall include non-volatile memory for retaining device settings during power outages.
9. NX On-Fixture Modules shall be rated and tested for an operating temperature range of -40° to 185°F [-40° to 85°C].
10. NX On-Fixture Module shall include one SPST relay for On/Off control.
11. NX On-Fixture Modules relay shall be supplied with "Zero Cross Switching" control to limit the effects of inrush on the relay contact.
12. NX On-Fixture Module shall be compatible with incandescent, magnetic, and electronic lighting loads including LED drivers.
13. Construction:
    a. Housing: GSM UL Rated 94 HB Plastic
    b. Mounting: Standard C136-41 (2013) with 5 or 7 pin twist-lock connector. Compatible with C136-10 sockets.
14. Electrical:
    a. Input: 120-480VAC, 50-60Hz
    b. Output: Relay output shall provide for the following load types and ampacity:
        1) 5A@120-347VAC,
        2) 3A@480V

c. Surge Withstand: 2000V
d. Peak Inrush: 160A for 2 ms Max
e. Standby Power (W):
    1) 120VAC: 1.2
    2) 277VAC: 1.5
    3) 347VAC: 1.5
    4) 480VAC: 1.3

15. Functional:
    a. On-Fixture Module shall include an integrated daylight sensor with a foot candle range as shown below:
        1) On level: 1FC to 5FC (Default: 5FC)
        2) Off level: 4FC to 15FC (Default: 8FC)
    b. NX On-Fixture Modules shall communicate with other NX enabled fixtures and devices via NX Wireless Network with the following characteristics:
        1) Robust & reliable IEEE 802.15.4 2.4GHz wireless self-organizing and self-healing mesh network
        2) Radio Range: Outdoor: ~1000 ft. (~300m) Note: Range based on clear line of site.
        3) Security: AES-128 (Advanced Encryption Standard)
16. NX On-Fixture Module shall include non-volatile memory for retaining device settings during power outages.
17. NX On-Fixture Module shall UL Listed to UL916 and Certified to CAN/CSA C22.2 NO 205-M1983.
18. NX On-Fixture Module shall be FCC certified.

2.6 LIGHTING CONTROL PANELS

A. NX Lighting Control Panels
1. Basis of Design Product: NX Lighting Controls System, NX Lighting Control Panels.
2. As indicated and where shown on the plans, install NX Lighting Control Panels V2 (NXP2 Series).
3. Panel shall be a fully distributed intelligent lighting controller with the ability to function as a stand-alone lighting control panel or as part of an NX networked system.
4. Panel shall provide standard capacities for 8, 16, 24, 32, or 48 relays in each panel with matching number of 0-10v dimming channels.
5. Panel shall be available in custom configurations. Configuration options shall include: panel shipment type (enclosure/interior shipped together, enclosure/interior shipped separately, enclosure only, and interior only), panel size, number of single pole/double pole relays, emergency control option, input voltage and enclosure mount (surface mount or flush mount).
6. Panels shall be factory assembled and tested. No field assembly shall be required.

7. Construction:
    a. Panel shall be surface or flush wall mounted in a NEMA1 rated enclosure, based on panel configuration.
    b. Panel shall be capable of being shipped with enclosure/interior together, enclosure/interior separately, enclosure only, and interior only in appropriately designed packaging. When enclosure is shipped separately, enclosure shall enable rough-in of all electrical connections prior to receipt of the panel interior.
    c. Panel enclosure shall have standard electrical conduit knockouts on the top, the bottom and both sides of the enclosure to allow installation flexibility. Field drilling and cutting for pipe and wire shall not be required.
    d. Panel shall provide keyhole mounting holes in the rear of the enclosure.
    e. Panel enclosure shall include 6" spacing running the width of the panel at the bottom of the panel to allow for line voltage accessories such as contactors or to provide a "gutter". Space shall be separated from the low voltage area utilizing a removable metal barrier. No knockouts added to the bottom plate of the inner high voltage divider. Exterior enclosure will maintain knockouts on bottom.
    f. Panel venting shall conform to NEMA 1 enclosure specifications to contain any local explosion and to protect the working environment.
    g. Panel enclosure shall feature removable metal barriers that separate all high-voltage components and wiring (Class 1) from all low-voltage (Class 2) components and wiring.
    h. Panel enclosure shall be of welded construction primed and painted with a powder coat finish. Unpainted or galvanized enclosures are not acceptable.
    i. Panel cover shall attach to the enclosure with #10-32 x ½" truss head machine screws.
    j. Panel cover shall employ "keyhole" style openings for the top two mounting screws to allow the panel's cover to be temporarily hung during installation eliminating the need to completely remove all the mounting screws along with contributing to safety ensuring the cover does not swing if all screws were removed.
        1) 8 Relay panel cover – 4 mounting holes: 2 keyhole style slots, 2 slotted style slots
        2) 16/32 Relay panel cover – 6 mounting holes: 2 keyhole style slots, 4 slotted style slots
        3) 48 Relay panel cover – 8 mounting holes: 2 keyhole style slots, 6 slotted style slots
    k. Panel cover shall be sized for either surface or recess mounting of the panel.
    l. Panel cover shall have hinged locking door to expose only the low voltage wiring section of the panel.
    m. Panel door hinges shall be located on the left side.

n. Panel shall be provided with a factory or field installable panel interior. Panel interior shall contain all controller electronics, power supplies, relays, and other required components. Panel shall arrive at the project site completely pre-wired and requiring only the connection of lighting circuits and network cable. Systems that require field assembly of controllers or chassis inserts are not acceptable

o. Panel interior components shall reside on a framed skeleton. When disconnected from the load circuits and necessary mounting connections, the framed skeleton can be removed taking all the electrical components intact.

p. Panel interior components shall be designed to not become dislodged during shipment.

q. Panel spacing between panel relays shall be suitable for separating any two relays in the panel to meet the CEC requirements for normal and emergency power when a metal divider is installed between relays. A metal plate barrier shall be available to separate relays - two plates per application.

r. Panel relays shall be of the snap-in type and be individually field replaceable.

8. Electrical:

a. Panel shall be supplied with either a 120V/277V, 347V or 480V power supply.

b. Panel power supply shall provide the required capacity for the operation of the panel, relays, controllers, NX Network, SmartPORTs, user interfaces and the maximum number of low voltage and/or data devices that can be connected to each panel.

c. Panel wire connections shall be made to labeled terminal blocks.

d. Panel shall have LED status/failure indicators.

e. Panel shall provide support for Bluetooth programming using the NX Lighting Controls App and the NX Bluetooth Radio Bridge with Clock or a SmartPORT connected NX sensor.

f. Panel shall include two (2) Ethernet ports for connection to the NX Network.

g. Panel shall include four (4) RJ45 NX SmartPORTs for the connection of all NX sensors and switches. SmartPORTs shall be capable of supplying 250 mA of Class 2 auxiliary DC power for use by wall switch stations, occupancy sensors, and daylight sensors connected to the SmartPORT connectors

h. Panel shall have four (4) 3-wire low voltage dry contact inputs. Removable terminal blocks shall be provided to support momentary or maintained closures from building automation systems, fire systems, demand response and security systems as well as other systems or devices including occupancy sensors, daylight sensors, and low voltage switches. Each input shall be individually programmable and provide the ability to initiate any NX switch compatible function or command. (on, off, raise, lower, preset, timed

on/off). Each input will provide a connection for sourcing 24V, a common, control and pilot light functionality for low voltage switch stations.

i. Panel shall have two (2) SPDT (NO/NC) dry contact outputs, with removable terminal blocks, to provide a contact closure to signal out to another system that is capable of receiving a NO or NC closure to signal building automation, security or alarm system based on a schedule or a command from an input device (e.g. occupancy sensor, daylight sensor, wall switch station, etc.). Each output will have a contact rating of 24VDC@50mA minimum.

j. Panel shall have an easily accessible, removable coin size battery for maintaining system time during a power loss.

k. Panel shall, after a power loss, retain time for a minimum of 72 hours.

l. Panel time shall be updated when connected to a device utilizing the NX Lighting Controls App or from an NX network time server.

m. Panel shall feature a power sensing circuit and transformer for UL924 operation. Upon detection of loss of power, the panel shall force all relays closed and all dimming channels to full bright. Panel shall maintain this state until normal power is restored. Connected devices will not be powered.

n. Panel shall have a test button on the optional UL924 board to test the UL924 operation.

o. Panel shall have a low voltage remote test switch input on the optional UL924 to test the UL924 operation.

p. Panel shall provide relay/dimmer boards to expand panel capacity from 8 to 48 relay outputs in groups of 8. Relay/dimmer boards shall be completely self-configuring and shall not require manual settings to configure for use within the panel.

q. Panel relay/dimmer boards shall confirm relay presence and status.

r. Panel relay/dimmer boards shall have (8) 0-10V integrated dimming channels, each capable of sinking 50mA.

s. Panel dimming channels shall be software assignable.

t. Panel shall be capable of containing 1 to 48 robust and reliable mechanically latching lighting control relays as indicated on the drawings and schedules as specified herein. Electrically held or non-mechanically latching relays shall not be considered.

u. Panel relays shall be individually UL and CUL listed and shall bear labels indicating compliance. Lighting control relays shall be tested to UL standard 508 for both safety and endurances and bare labels signifying compliance.

v. Panel relays shall have the following load ratings:
    1) Single Pole Relays:
        a) General Use: 30A @ 300VAC
        b) Tungsten: 2400W @ 120VAC
        c) Standard Ballast: 20A @ 300VAC
        d) Motor Starting: 1HP @ 110-125VAC; 1½ HP @ 220-277VAC

2) Double Pole Relays:
    a) General Use: 20A @ 480VAC
    b) Tungsten: 2400W @ 120VAC
    c) Standard Ballast: 20A @ 480VAC
    d) Motor Starting: 1HP @ 110-125VAC; 1½ HP at 220-277VAC

w. Panel relays shall be rated for minimum cycle life of 120,000+ operations (60,000+ cycles).

x. Panel relays shall have a Short Circuit Current Rating (SCCR) of 18,000A @ 277VAC.

y. Panel relays shall have a built-in manual override lever & ON/OFF indicator.

z. Panel relays shall be capable of manual activation On or Off with or without power.

9. Functional:

a. Panel shall be of the distributed intelligence type and shall not be dependent on a network connection to execute schedules or perform programmed functions.

b. Panel shall be programmed using the optional NXBTC Bluetooth® radio module with clock and NX Lighting Controls App. When networked, panel configurations shall be performed utilizing the NX Area Controller's web-browser based Graphical User Interface.

c. Panel shall provide the ability to update panel firmware. Firmware update process shall ensure that the complete and correct firmware (e.g. via CRC check) has been downloaded before the panel is flashed with the new firmware.

d. Panel set up and configuration functions shall include (but are not limited to):
    1) Assign/reassign relays for control by wall switch station buttons,
    2) Configure relays for occupancy or vacancy operation,
    3) Assign/reassign dimmers to raise/lower switches,
    4) Assign dimming channels for response to daylight sensor control,
    5) Assign names to relays/dimmers,
    6) Auto calibrate default daylight sensor sequence of operation,
    7) Create and save preset scenes,
    8) Configure wall switch button types. At a minimum, button types shall include toggle on/off with pilot, preset, on only and off only,
    9) Configure up to six zones of daylight harvesting per room with independent set points and time delays,
    10) Include or exclude loads from occupancy sensor control,
    11) Configure up to 16 load groups per zone,
    12) Configure up to 16 preset scenes per zone with independent fade times,
    13) Set independent power up conditions for relays and dimmers,

14) Set independent occupied and unoccupied conditions for each relay and dimmer,
15) Adjust dimmer high and low trim points,
16) Manually control lighting loads

e. Panel shall provide the ability to create up to ninety-nine (99) schedules per zone. Each schedule will consist of the following:
1) Event Time – Shall be configured as a specific set "Normal" time (hh:mm am/pm) or as an offset based on one of the following: Before Sunrise, After Sunrise, Before Sunset, After Sunset, Before Open, After Open, Before Close or After Close.
2) Action – Task to be performed: None, Group State, or activation of a Preset.
3) None – No action to perform
4) Group State – The specific relay / dim level / color temp range settings, that the select group(s) of actuators should implement.
5) Presets – The specific preset that should be activated.

f. Panel shall provide the ability to disable a schedule
g. Panel shall provide the ability to delete a schedule

2.7 CONTROLLED RECEPTACLES

A. HCS Controlled Receptacle
1. Basis of Design Product: NX Lighting Controls System, HCSREC Series Controlled Receptacle.
2. Controlled Receptacle shall be capable of controlling other receptacles downstream in the branch circuit.
3. Controlled Receptacle shall be automatically controlled by a low voltage signal from an occupancy sensor or any other type of control capable of performing this task, e.g., time-of-day control device.
4. Controlled Receptacle shall be available in split or fully controlled 15A or 20A models.
5. Controlled Receptacle shall feature permanent CEC 406.3 (E) markings.
6. Controlled Receptacle shall be UL498B SA Listed Receptacles with integral switching that complies with Supplement SA.

2.8 SENSORS

A. NX Smart Sensor Module Passive Infrared, Wireless Occupancy & Daylight Sensor
1. Basis of Design Product: NX Lighting Controls System, NX Smart Sensor Modules.
2. As indicated in the specifications and as shown on the plans, install NXSMP series sensor module enabled fixture(s).
3. NX Smart Sensor Module shall be designed to install directly into or on the fixture housing or lens.

4. NX Smart Sensor Module shall integrate seamlessly into the NX Network.
5. NX Smart Sensor Module shall have an RF frequency of 2.4GHz.
6. NX Smart Sensor Module shall include Bluetooth and provide connection to the NX Network using the NX Lighting Controls App.
7. NX Smart Sensor Module Occupancy/Vacancy sensor shall provide automatic or vacancy switching of lighting load(s) within an area/zone based on the presence of human activity.
8. NX Smart Sensor Module Occupancy/Vacancy sensor shall be microprocessor controlled and utilize IntelliSCOPE™ technology to provide real-time graphical occupancy data.
9. NX Smart Sensor Module Occupancy/Vacancy sensor shall not require any adjustments of any kind at the time of installation or during operation.
10. NX Smart Sensor Module Occupancy/Vacancy sensor shall be powered by SmartPORT™ using plenum rated SmartPORT plug and play cables.
11. NX Smart Sensor Module Occupancy/Vacancy sensor shall have a timer that can be adjusted manually from 1 second to 20 minutes.
12. NX Smart Sensor Module Occupancy/Vacancy sensor sensitivity shall be adjustable from 1 to 10.
13. NX Smart Sensor Module Occupancy/Vacancy sensor shall include non-volatile memory for retaining device settings during power outages.
14. NX Smart Sensor Module Occupancy/Vacancy sensor shall have RED real time motion indicator LED visible from the front of the unit.
15. NX Smart Sensor Module Occupancy/Vacancy sensor may be programmed for active and inactive times.
16. NX Smart Sensor Module Occupancy/Vacancy sensor shall be available with the following 360° coverage patterns:
    a. SMI/LMI – 1:1 (mounting height to radius) up to 14 feet
    b. OMNI – 1:1.5 (mounting height to radius) up to 14 feet
    c. LMO – 1:3 (mounting height to radius) up to 16 feet
    d. HMO – 1:1.4 (mounting height to radius) up to 45 feet indoors / 32 feet outdoors
17. NX Smart Sensor Module daylight sensor shall continually measure the amount of visible light under the lighting fixture to provide continuous On/Off and full range dimming control of fixture or group under its control.
18. NX Smart Sensor Module daylight sensor shall utilize a closed loop daylight harvesting algorithm to maintain the required light level in response to changes in daylight.
19. NX Smart Sensor Module daylight sensor shall have independently programmable ramp up and ramp down times to allow the sensor to respond quickly to decrease in daylight and respond more slowly to increase in daylight to minimize the effect of sudden changes in daylight.

20. NX Smart Sensor Module daylight sensor shall be capable of being programmed for active and inactive times.
21. NX Smart Sensor Module daylight sensor shall include non-volatile memory for retaining device settings during power outages.

B. NX Smart Sensor Module Dual Technology, Wireless Occupancy & Daylight Ceiling Mount Sensor
1. Basis of Design Product: NX Lighting Controls System, NX Smart Sensor Modules.
2. As indicated in the specifications and as shown on the plans, install NXSMDT series sensor modules.
3. NX Smart Sensor Module DT shall be designed for indoor use only and to mount directly to ceilings.
4. NX Smart Sensor Module DT shall integrate seamlessly into the NX Network.
5. NX Smart Sensor Module DT shall have an RF frequency of 2.4GHz.
6. NX Smart Sensor Module shall include Bluetooth and provide connection to the NX Network using the NX Lighting Controls App.
7. NX Smart Sensor Module DT Occupancy/Vacancy sensor shall provide automatic or vacancy switching of lighting load(s) within an area/zone based on the presence of human activity.
8. NX Smart Sensor Module Occupancy/Vacancy sensor shall be microprocessor controlled and shall have adjustable technology detection modes including Dual Technology (Passive Infrared (PIR) and Ultrasonic (US)), Passive Infrared (PIR) only, and Ultrasonic (US) only.
9. NX Smart Sensor Module Occupancy/Vacancy sensor shall utilize IntelliSCOPE™ technology to enable fine-tuning of the motion detection technologies using real-time Passive Infrared (PIR) and Ultrasonic (US) graphical occupancy data.
10. NX Smart Sensor Module DT Occupancy/Vacancy sensor shall be powered by SmartPORT™ using plenum rated SmartPORT plug and play cables.
11. NX Smart Sensor Module DT Occupancy/Vacancy sensor shall have a timer that can be adjusted manually from 1 second to 20 minutes.
12. NX Smart Sensor Module DT Occupancy/Vacancy sensor sensitivity shall be adjustable from 1 to 10.
13. NX Smart Sensor Module DT Occupancy/Vacancy sensor shall include non-volatile memory for retaining device settings during power outages.
14. NX Smart Sensor Module DT Occupancy/Vacancy sensor shall have a Red Passive Infrared (PIR) and Green Ultrasonic (US) real time motion indicator LEDs visible from the front of the unit.
15. NX Smart Sensor Module DT Occupancy/Vacancy sensor may be programmed for active and inactive times.
16. NX Smart Sensor Module DT Occupancy/Vacancy sensor shall have the following coverage:
    a. 1:2.75 Coverage pattern (mounting height to coverage radius)

b. Coverage: Adjustable up to 2,000 square feet
c. Recommended Mounting Height: 8ft (2.44m) with a max mounting height: 12ft (3.66m)

17. NX Smart Sensor Module DT daylight sensor shall continually measure the amount of visible light under the lighting fixture to provide continuous On/Off and full range dimming control of fixture or group under its control.
18. NX Smart Sensor Module DT daylight sensor shall utilize a closed loop daylight harvesting algorithm to maintain the required light level in response to changes in daylight.
19. NX Smart Sensor Module DT daylight sensor shall have independently programmable ramp up and ramp down times to allow the sensor to respond quickly to decrease in daylight and respond more slowly to increase in daylight to minimize the effect of sudden changes in daylight.
20. NX Smart Sensor Module DT daylight sensor shall be capable of being programmed for active and inactive times.
21. NX Smart Sensor Module DT daylight sensor shall include non-volatile memory for retaining device settings during power outages.
22. NX Smart Sensor Module DT shall be available in White, Black and Gray colors.

C. NX Occupancy Sensors, Wired
1. Basis of Design Product: NX Lighting Controls System, NX Occupancy Sensors.
2. NX Occupancy Sensors shall be ceiling or wall mounted and use dual technology (ultrasonic and passive infrared), ultrasonic and/or passive infrared (model specific) sensing technology as indicated.
3. NX Occupancy Sensors shall be Class 2 and connect to any room controller SmartPORT using a wiring adaptor and standard Cat5 patch cable.
4. NX Occupancy Sensors shall be microprocessor controlled and utilize IntelliDAPT® technology to optimize sensor behavior to adapt to space conditions and occupant usage patterns and adjust sensitivity and time delay to maximize energy savings and minimize false On and Off events
5. NX Occupancy Sensors shall be self-adaptive and not require manual calibration after installation. Digital circuitry and logic shall automatically adjust the sensitivity and time delay based on learned occupancy patterns and the environment in which the sensor is installed.
6. NX Occupancy Sensors using both ultrasonic and passive infrared (dual technology) shall operate such that detection by both technologies is required to initiate occupancy and continued detection by either technology will maintain occupancy.
7. Up to four NX Occupancy Sensors may be connected to one room controller.

D. NX Occupancy Output Interface

1. Basis of Design Product: NX Lighting Controls System, NXRO Series Occupancy Output Interface Module.
2. NX Occupancy Output Interface shall communicate the occupancy state of an NX control zone to HVAC or other building systems using a contact closure.
3. NX Occupancy Output Interface shall connect to a SmartPORT™ and provide the aggregate occupancy state of the zone as reported by one or more occupancy sensors.
4. NX Occupancy Output Interface shall mount to a standard 4 11/16" junction box.
5. NX Occupancy Output Interface shall have a removable terminal block for input connection.
6. NX Occupancy Output Interface shall be powered by NX SmartPORT.
7. NX Occupancy Output Interface shall support multiple occupancy sensors in a zone.
8. NX Occupancy Output Interface shall feature a low voltage Form-C relay for Normally Closed / Normally Open operation.
9. NX Occupancy Output Interface shall be a low voltage device: 24VDC.

E. NX Daylight Sensor, Wired

1. Basis of Design Product: NX Lighting Controls System, NXDS Series Daylight Sensor.
2. NX Daylight Sensor shall provide ambient light level information to the room controller allowing daylight responsive lighting control.
3. The system shall operate in an open loop sequence of operation reducing the amount of electric light as the quantity of daylight entering the room increases.
4. It shall be possible to configure up to six daylight zones in a room. Each zone shall be programmable to proportionally respond to the light level provided by the daylight sensor.
5. NX Daylight Sensor shall be mounted vertically or horizontally and positioned to provide an unobstructed view of the windows per the manufacturer's directions.
6. NX Daylight Sensor shall be available in indoor and outdoor models.
7. NX Daylight Sensor shall have an architecturally attractive design.
8. NX Daylight Sensor shall have a foot-candle range: 3-6,000FC

F. NX Wall Partition Sensor

1. Basis of Design Product: NX Lighting Controls System, NXWPS Series Wall Partition Sensor.
2. NX Wall Partition Sensor shall automatically signal the NX Lighting Controls System when a moveable partition has been opened or closed. This allows the two adjacent rooms to be combined or separated into individual rooms.
    a. NX controls shall automatically reconfigure to operate in unison when rooms are combined.
    b. NX controls shall automatically reconfigure to operate independently when the rooms are separated.

c. NX system shall allow for room combine scenarios with up to 16 combinable rooms.

3. NX Wall Partition Sensor shall be a low voltage device: 24VDC.

G. NX Dry Contact Closure Interface

1. Basis of Design Product: NX Lighting Controls System, NXCI Series Contact Closure Interface.
2. NX Dry Contact Closure Interface shall enable third-party devices to provide dry contact inputs to the NX Lighting Controls System.
3. NX Dry Contact Closure Interface shall provide switch activation using contact closures from external devices such as key switches, AV systems, photo-eye sensors or other low voltage Class 2 devices.
4. NX Dry Contact Closure Interface shall default to On/Off operation and can be programmed to perform alternate functions including:
   a. Toggle On/Off
   b. Preset
   c. Raise
   d. Lower
   e. Timed On
5. NX Dry Contact Closure Interface shall feature a removable terminal block for input connection.
6. NX Dry Contact Closure Interface shall feature pilot light output terminals.
7. NX Dry Contact Closure Interface shall be a low voltage device: 24VDC.

2.9 WALL STATIONS

A. NX SimpleTouch™ Graphic Wall Station

1. Basis of Design Product: NX Lighting Controls System, NX SimpleTouch Graphic Wall Station.
2. Graphic Wall Station shall employ a 3.5” resistive LCD-TFT, full-color touch screen with 320x480 screen resolution in portrait orientation.
3. Graphic Wall Station shall mount to a standard single gang switch box.
4. Graphic Wall Station shall utilize standard Cat5 cabling for connection to system SmartPORT. Provide two RJ45 ports to allow daisy chain connection with other NX Smart Switches.
5. Graphic Wall Station shall operate seamlessly with other NX Smart Switches.
6. Graphic Wall Station shall provide a 4GB microSD card for storing user preferences that include the quantity of controls per screen, function names, screen navigation, home screen selection, and custom screen saver graphic image.
7. Graphic Wall Station screens can be configured to meet project requirements for control of up to 16 groups, each with provision for On/Off and dimming, up to 16 preset scenes, or CCT color control.

8. Graphic Wall Station shall be capable of local control within a single space or configured for master control across spaces or building wide.
9. Graphic Wall Station shall have an optional password access control that will require a secure PIN to access the station.
10. Graphic Wall Station shall have adjustable screensaver timeout and backlight brightness.
11. Graphic Wall Station shall be supplied with a white bezel. Optional color change kit shall allow for Ivory, Grey, Light Almond, or Black.

B. NX Smart Switches (Wired)
1. Basis of Design Product: NX Lighting Controls System, NXSW Series Smart Switches (Wired).
2. NX Smart Switches (Wired) shall be of the programmable type using standard Cat5 cabling for connection to system SmartPORT™.
3. NX Smart Switches (Wired) shall have one to six buttons and provide lighting control functions as called out and shown on the plans.
4. NX Smart Switches (Wired) shall be available with the following specialty versions:
   a. OO: On/Off
   b. ORLO: On/Raise/Lower/Off
   c. RL: Raise/Lower
   d. TO: Timed-On
   e. SS: Scene
5. Construction:
   a. Housing: Rugged, high impact, injection molded plastic
   b. Mounting: Switches shall be capable of being mounted to single-gang and multi-gang wall boxes and shall be compatible with standard decorator style wall plates.
6. Electrical:
   a. Class 2 Low Voltage 24VDC
   b. Connection via two (2) RJ-45 SmartPORTs to allow for daisy chain connection of up to eight switches to each SmartPORT.
7. NX Smart Switches (Wired) shall be available in White, Ivory, Light Almond, Gray, Black, and Red.

C. NX Smart Switches (Wireless)
1. Basis of Design Product: NX Lighting Controls System, NXSW Series Smart Switches (Wireless).
2. NX Smart Switches (Wireless) shall be of the programmable type using the NX Lighting Controls App.
3. NX Smart Switches (Wireless) shall have a single rocker switch with two momentary switches and provide lighting control functions as called out and shown on the plans.

4. NX Smart Switches (Wireless) shall be programmable with the following switch functions:
    a. On/Off
    b. On/Raise
    c. Off/Lower
    d. Raise
    e. Lower
    f. Timed-On
    g. Scene
5. Construction:
    a. Housing: Rugged, high impact, injection molded plastic
    b. Mounting: Switches shall be capable of being mounted directly to wall surfaces using provided 3M Command™ Strip, and to single-gang and multi-gang wall boxes and shall be compatible with standard decorator style wall plates (not included).
    c. Switches shall include a built-in level to ensure device is mounted properly.
6. Electrical:
    a. Class 2 Low Voltage 24VDC
    b. 3VDC, 5.4mA
    c. Powered using CR2032 battery only
7. NX Smart Switches (Wireless) shall be available in White.

D. NX Audio Visual Interface Module
1. Basis of Design Product: NX Lighting Controls System, NXAVM Series Audio Visual Interface Module.
2. NX Audio Visual Interface Module shall enable third-party systems to digitally interface with an NX Lighting Controls System.
3. NX Audio Visual Interface Module shall provide an ASCII based command set to interface with third-party systems such as Audio-Visual systems to send commands to and receive query status from an NX system.
4. NX Audio Visual Interface Module shall feature a DB9 connector and support RS232 serial communication, providing control and status for a single zone.
5. NX Audio Visual Interface Module shall mount to a standard 4 11/16” junction box.

2.10 NETWORK AREA CONTROLLER

A. NX Area Controller
1. Basis of Design Product: NX Lighting Controls System, NX Area Controller V2 (NXAC2 Series).
2. NX Area Controller shall provide a simple and highly intuitive graphical user interface (GUI) to the NX Lighting Controls System via a personal computer.

3. NX Area Controller shall enable any PC with a standard web-browser to interface with the NX system through a built-in web server.
4. NX Area Controller shall enable system users to easily program, monitor and control (locally or remotely) the functions of the NX system.
5. NX Area Controller shall connect to the NX Network providing communication with the NX Room Controllers, NX Lighting Control Panels, NX SmartPORT™ Modules and other wired NX system components.
6. NX Area Controller shall have the ability to communicate by means of TCP/IP over Ethernet allowing enterprise connectivity between the NX Lighting Controls System and external LAN or WAN networks.
7. NX Area Controller shall be capable of communicating with Building Automation System via an embedded BACnet™ client using the BACnet IP protocol.
8. NX Area Controller shall enable the connection of multiple users simultaneously.
9. NX Area Controller shall enable secure remote connections over a cellular network.
10. NX Area Controller shall have a physical modem switch that can turn off remote cellular and Wi-Fi radios.
11. NX Area Controller shall feature user account/password management.
12. Construction:
    a. Design: Solid State – No moving parts
    b. 7.32” W x 2.6” H x 4.9” D (186mm x 66mm x 126mm)
    c. 2.9 LB (1.21 KG)
    d. Mounting: Wall or DIN rail mounting
    e. Housing Color: Black
13. Electrical:
    a. 100-240VAC, 50/60 Hz (AC Adapter included)
    b. Ethernet 10 base-T via NX Network cable, integral 2-port ethernet hub.
14. Functional:
    a. NX Area Controller shall function as a web server allowing the user interface to be accessible through a standard web browser.
    b. The installation of software shall not be required. At a minimum, the user interface shall provide the following functions:
        1) Automatic discovery of NX system devices
        2) Commissioning of devices into logical Areas and Zones, provide a minimum of 128 areas each with 128 zones
        3) Display the entire system in a logical navigation tree view
        4) Allow the user to name Zones, Groups, Presets, Schedules and individual loads
        5) Set up control functions for system inputs and outputs
        6) Monitor status and override individual relays and dimmers
        7) Set up and download schedules to panels and room controllers
        8) Monitor real-time power use at each room controller

2.11 NETWORK MODULES

A. NX Network Bridge Module
   1. Basis of Design Product: NX Lighting Controls System, NX Network Bridge Module.
   2. NX Network Bridge Module shall allow multiple room controller zones to be networked with other NX system devices for whole building administration of lighting control functions.
   3. NX Network Bridge Module housing shall measure 5.75" X 3.85" X 1.3"and be constructed of GSM UL rated 94 HB plastic approved for use in a return air plenum.
   4. NX Network Bridge Module shall connect to and be powered from a room controller SmartPORT via a standard Cat5 cable.
   5. NX Network Bridge Module shall provide RJ-45 ports for in and out connection points for an Ethernet based network.
   6. NX Network Bridge Module shall provide a communication link between the room control devices and the NX system Area Controller via an Ethernet based network. At a minimum, the network link shall provide the following functionality through a web browser user interface:
      a. Report the current occupancy status for each lighting control zone
      b. Indicate the status of each relay and dimming channel
      c. Allow reconfiguration of system device input and output parameters
      d. Report the real time power consumption for each Room Controller
      e. Set up daylight harvesting for zones equipped with photocells
      f. Configure and download schedules to panels and Room Controllers

B. NX Network Radio Module
   1. Basis of Design Product: NX Lighting Controls System, NXRM2 Series Radio Module.
   2. NX Network Radio Module shall allow a luminaire equipped with the NXFM In-Fixture Module to be promoted wirelessly from standalone operation to full network participation.
   3. NX Network Radio Module shall plug into the SmartPORT™ connector on the NXFM In-Fixture Module and is mounted through a 1.25” aperture in the luminaire housing.
   4. NX Network Radio Module shall feature a low-profile housing for minimal visual impact.
   5. NX Network Radio Module shall feature an O-ring gasket to provide watertight seal to luminaire housing.
   6. NX Network Radio Module shall have an integrated and compact PCB F antenna and shall not require an external antenna.
   7. NX Network Radio Module shall integrate seamlessly into the NX Network.
   8. NX Network Radio Module shall have an RF frequency of 2.4GHz.

9. NX Network Radio Module shall include Bluetooth and provide connection to the NX Network using the NX Lighting Controls App.

C. NX Network Interface Module:
   1. Basis of Design Product: NX Lighting Controls System, NXHDI Series Device Network Interface Module.
   2. NX Network Interface Module shall provide network connection and power to accessory components including NX Dry Contact Interface and NX SmartPORT Modules.
   3. NX Network Interface Module shall be discoverable by the NX Area Controller and controllable through web browser interface.
   4. NX Network Interface Module shall repeat network communication signal to extend network length.
   5. NX Network Interface Module shall feature integral link indicators confirming network segment status.
   6. NX Network Interface Module shall feature a power LED indicator confirming presence of accessory DC power on NX Network segment.
   7. NX Network Interface Module shall feature dual RJ45 NX Network input and output jacks to enable module to be inserted anywhere along the NX Network as needed.
   8. Construction:
      a. Extruded and sheet aluminum
      b. Weight: 6 oz (170.1g)
      c. Mounting: 1.38” (35mm) DIN rail
   9. Electrical:
      a. Input: 24VDC, 800mA max current via NX Network cable
      b. Output: 24VDC power supplied to connected accessory modules
   10. NX Network Interface Module shall be Title 24 Compliant.

D. NX SmartPORT Module
   1. Basis of Design Product: NX Lighting Controls System, NX SmartPORT Module.
   2. NX SmartPORT Module shall provide the ability to easily connect smart switch stations, motion detectors, and daylight sensors into the NX network system.
   3. NX SmartPORT Module shall have (4) SmartPORTs each with (2) RJ45 connectors for convenient connection of multiple devices.
   4. Devices connected to the SmartPORT module shall be network visible and configurable to operate with panels and room controllers via the web browser user interface.
   5. NX SmartPORT Module shall be compatible with all NX Smart Switch Stations, NX Occupancy Sensors and NX Daylight Sensor.
   6. NX SmartPORT Module shall feature DIN rail mounting.
   7. NX SmartPORT Module shall be a low voltage device: 24VDC.

E. NX Dry Contact Interface Module
   1. Basis of Design Product: NX Lighting Controls System, NXDCIO Series Dry Contact Interface Module.
   2. NX Dry Contact Interface Module shall provide a simple way to incorporate standard dry contact inputs and outputs into the NX Lighting Controls System.
   3. NX Dry Contact Interface Module shall accommodate dry contact input closures from building automation, fire, security, and many other types of systems.
   4. NX Dry Contact Interface Module shall be programmable from the NX Area Controller.
   5. NX Dry Contact Interface Module shall feature (6) individually programmable dry contact inputs with or without pilots.
   6. NX Dry Contact Interface Module shall accommodate 2 and 3 wire inputs (momentary or maintained).
   7. NX Dry Contact Interface Module shall feature (6) individually programmable Form-C dry contact outputs.
   8. NX Dry Contact Interface Module shall have removable terminal blocks for easy connections.
   9. NX Dry Contact Interface Module shall feature DIN rail mounting.
   10. NX Dry Contact Interface Module shall be a low voltage device: 24VDC.

2.12 NETWORK ACCESSORIES

A. NX Bluetooth® Radio Bridge with Real Time Clock
   1. Basis of Design Product: NX Lighting Controls System, NXBTC Series Bluetooth Radio Controller.
   2. NX Bluetooth Radio Bridge with Real Time Clock shall provide a wireless communication bridge for communications via iOS® or Android™ smart device apps.
   3. NX Bluetooth Radio Bridge with Real Time Clock shall connect to and be powered by an NX SmartPORT™.
   4. NX Bluetooth Radio Bridge with Real Time Clock shall use Bluetooth technology allowing the radio to easily pair with a smart phone or tablet.
   5. NX Bluetooth Radio Bridge with Real Time Clock shall communicate with the NX system for setup and control from a smart device.
   6. NX Bluetooth Radio Bridge with Real Time Clock shall feature a real time clock and allow schedules to be downloaded and run in stand-alone NX Room Controller applications without a network.
   7. NX Bluetooth Radio Bridge with Real Time Clock shall provide password protections for user access preventing unauthorized Bluetooth connection of a smart device.
   8. NX Bluetooth Radio Bridge with Real Time Clock shall use Bluetooth Version 4.1.

9. NX Bluetooth Radio Bridge with Real Time Clock shall feature an LED status indicator for successful connections.
10. NX Bluetooth Radio Bridge with Real Time Clock shall have a RJ45 plug-in connection to NX SmartPORT.
11. NX Bluetooth Radio Bridge with Real Time Clock shall be a low voltage 24VDC device.
12. NX Bluetooth Radio Bridge with Real Time Clock shall be rated for return air plenum

B. NX Media Converter
1. Basis of Design Product: NX Lighting Controls System, NXEOF Series Media Converter.
2. NX Media Converter shall allow a transition from copper based ethernet to fiber.
3. NX Media Converter shall support 10BASE-T, 100BASE-TX, 100BASE-FX and IEEE 802.3 specifications.
4. NX Media Converter shall be a multimode converter and support up to 5km distance.
5. NX Media Converter shall include and RJ45 port that supports full/half-duplex auto-negotiation and MDI/MDIX auto-crossover.
6. NX Media Converter shall include LED indicators for RJ45 and fiber port status.
7. NX Media Converter shall include a wall mounting kit.

C. NX Network PoE Switch
1. Basis of Design Product: NX Lighting Controls System, NXPOE Series PoE Switch/Power Injector.
2. NX Network PoE Switch shall provide the splitting of the Network network from the NX Area Controller into multiple segments.
3. NX Network PoE Switch shall provide seven powered RJ45 ports for connection of NX network devices.
4. NX Network PoE Switch shall provide multiple dimming options including DMX to less than 0.1%.
5. NX Network PoE Switch shall expand the capacity of the NX Area Controller to 448 bridges suitable for large commercial and architectural interiors.

D. NX Energy Dashboard
1. Basis of Design Product: NX Lighting Controls System, NX Energy Dashboard.
2. NX Energy Dashboard shall provide real-time monitoring of energy consumption for the NX Lighting Controls System.
3. NX Energy Dashboard shall provide monitoring for up to 300 zones.
4. NX Energy Dashboard shall report out power and energy consumption for a specific, user selected zone.

5. NX Energy Dashboard shall be able to export out consumption data in .csv format for third party applications.
6. NX Energy Dashboard shall provide a wide range of reporting & monitoring intervals from less than an hour to multiple years.
7. NX Energy Dashboard shall be able to manage user rights & permissions to access the dashboard portal.
8. NX Energy Dashboard shall be able to manage system configuration changes and network settings.
9. Construction:
    a. NX Energy Dashboard electronics shall be housed in a NEMA 1 polycarbonate enclosure suitable for surface wall mounting.
    b. NX Energy Dashboard enclosure shall measure 13.41"H x 11.41" W x 7.38" D and include a hinged locking door.
    c. NX Energy Dashboard enclosure shall be IP66 rated.
    d. NX Energy Dashboard components shall be mounted inside the enclosure on flat panel, 35mm DIN rail.
10. Electrical:
    a. Input: 120-240VAC, 60Hz hard wired supply connection.
11. Networking & Software:
    a. N4 Niagara Operating System.
    b. 10-Base T Ethernet via (2) RJ-45 ports.
    c. (1) Micro USB for serial shell access.
    d. (1) Mini-B USB port
    e. 4GB Internal flash memory for storage

E. NX Forward and Reverse Phase Dimming Converter
1. Basis of Design Product: NX Lighting Controls System, NX Forward and Reverse Phase Dimmer Converter.
2. NX Forward and Reverse Phase Dimmer shall auto-sense forward and reverse phase dimming.
3. NX Forward and Reverse Phase Dimmer shall dim standard 120V or 277V lighting loads.
4. NX Forward and Reverse Phase Dimmer shall support up to 1300W max load.
5. NX Forward and Reverse Phase Dimmer shall provide dual 0-10V input and output ports.
6. NX Forward and Reverse Phase Dimmer shall provide an integrated 6.5ft flexible conduit.
7. NX Forward and Reverse Phase Dimmer shall be compatible with NX Room Controllers, NX Lighting Control Panels and Low Voltage Dimming Switches.
8. Construction:
    a. Housing: Anodized aluminum
    b. Size: 4.01” L x 5.52” W x 1.88” H

c. Complies with requirements for use in a plenum area
d. Mounting: Surface mount with screws

9. Electrical:
   a. Input: 120/277VAC, 60Hz – Single feed input connection
   b. Output: 120/277VAC, 60Hz – Single feed output connection
   c. Low Voltage: Class 2, 0-10V Input and output
   d. Max Load Rating:
      1) 120VAC: 700W
      2) 277VAC – 1300W
   e. Min Load Rating: 24W
   f. Standby Power:
      1) 120VAC: 0.75W
      2) 277VAC: 1.87W
   g. Dimming:
      1) Class 2 / Class 1 (NOTE: Installation as Class 1 requires 600 volt insulation on dimming conductors sharing a conduit with line voltage conductors)

2.13 SOFTWARE INTERFACES

A. NX Area Controller Graphical User Interface (GUI):
   1. NX Area Controller GUI shall serve as a primary interface for the networked lighting system, providing communication with lighting control panels, room controllers, fixture modules, and other wired system components and through wireless access point to wireless room controllers and fixture modules.
   2. NX Area Controller GUI shall be accessible via conventional PC web browser through the NXAC Series Area Controller's built-in web server.
   3. NX Area Controller GUI shall enable users to program, monitor, and administer the NX Lighting Controls System from any location without additional software.
   4. NX Area Controller GUI shall include an embedded BACnet IP client that is field configurable, enabling integration of the NX Lighting Controls System and a building automation system.

B. NX Lighting Controls App
   1. NX Lighting Controls App shall provide Bluetooth® wireless setup and configuration of NX system devices and luminaires equipped with an NX In-Fixture Module and smart sensor.
   2. NX Lighting Controls App shall be available in Android and iOS versions for free download from Google Play™ or Apple® App Store.
   3. NX Lighting Controls App shall connect to NX devices via NXBTR/NXBTC modules, NXSMP/NXSMP2 sensors and radio modules via Bluetooth BLE.

4. NX Lighting Controls App shall enable easy setup and configuration of NX room devices and NX panels.
5. NX Lighting Controls App shall enable users to create custom schedules and presets.
6. NX Lighting Controls App shall be able to configure SpectraSync™ or SpectraClean™ enabled luminaires.
7. NX Lighting Controls App shall globally discover wireless enabled luminaires and devices.
8. NX Lighting Controls App shall include the IntelliSCOPE™ visual diagnostic tool for real-time calibration and testing of NX digital smart sensors.

2.14 CONDUCTORS AND CABLING

A. Power Supply Side of Remote-Control Power Sources: Comply with network manufacturer's requirements and requirements of Division 26 Section "Low-Voltage Electrical Power Conductors."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to installation, contractor shall examine work area to verify measurements, all wire type and routing requirements, and that commencing installation complies with manufacturer's requirements.

B. Where variations from the general specifications or drawings exist, the contractor shall request a clarification prior to rough in or installation

3.2 INSTALLATION

A. Lighting controls shall be installed in accordance with manufacturer’s instructions, guidelines and submittal documents provided by the lighting control manufacturer.

B. Lighting control system components shall only be installed in spaces that meet the following environmental conditions:

1. Temperature: 32 – 104 deg F (0 - 40 deg C).
2. Relative Humidity: 10 – 90 percent, noncondensing.

C. All stored and installed lighting control system components shall be adequately protected from dust and dirt.

3.3 SYSTEM STARTUP

A. The system manufacturer shall provide a factory authorized field engineer to the project site after installation has been completed and prior to system energization for the purpose of testing and adjustment of the system.

B. Factory field engineer shall test and verify all system functions and ensure proper operation of the system components in accordance with the specifications and on-site conditions. The installing contractor shall notify the system manufacturer in writing that the system is completely wired and ready to be energized and tested 2 weeks prior to scheduling a field engineer for start-up of the system. Should the field engineer arrive on the job site and find the installation incomplete, the installing contractor shall pay the cost of any future visits by the field engineer required to complete the system start-up.

C. Factory field engineer shall provide a written report of test and outcomes.

3.4 DEMONSTRATION AND TRAINING

A. Factory field engineer shall instruct owner's staff on how to adjust, operate and maintain lighting systems; and provide instruction using the system software.
   1. Allow for up to 4 hours of on-site training on the use and maintenance of the lighting control system to be scheduled at the completion of startup and programming of the system.

3.5 TECHNICAL SUPPORT

A. Manufacturer shall provide reasonable access to factory direct telephone technical support during normal business hours.

END OF SECTION

SECTION 28 31 00

FIRE DETECTION AND ALARM

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fire alarm system and associated components, including control unit, related equipment, initiating devices, interface modules, and notification appliances.

1.02 RELATED REQUIREMENTS

B. Section 078400 - Firestopping.

C. Section 087100 - Door Hardware: Electrically-operated locks and electromagnetic door holders for interface with fire alarm system.

D. Section 260500 – Common Work for Electrical

E. Section 260503 – Equipment Wiring Connections

F. Section 260511 – Requirements for Electrical Installation

G. Section 260526 - Grounding and Bonding for Electrical Systems.

H. Section 260533 – Hanger and Supports.

1.03 ABBREVIATIONS AND ACRONYMS

I. A: Amps.

J. AHJ: Authorities having jurisdiction.

K. AV: Audio-visual.

L. CLSS: Connected life-safety services.

M. EVACS: Emergency voice/alarm communication systems.

N. FACU: Fire alarm control unit.

O. FSAE: Fire Service Access Elevators

P. HVAC: Heating, ventilation, and air conditioning.

Q. IDC: Initiating device circuit.

R. LAN: Local area network.

S. NAC: Notification appliance circuit.

T. SLC: Signaling line circuit.

U. USB: Universal serial bus.

V. VAC: Voltage alternating-current.

W. VDC: Voltage direct-current.

X. Vrms: Voltage root-mean-square.

Y. W: Watts.

1.04 REFERENCE STANDARDS

Z. ADA Standards - ADA Standards for Accessible Design.

AA. FM (AG) - FM Approval Guide; Current Edition.

BB. ISO 9001 - Quality Management Systems — Requirements; 2015, with Amendment (2024).

CC. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.

DD. NFPA 10 - Standard for Portable Fire Extinguishers; 2026.

EE. NFPA 25 - Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems; 2026.

NFPA 72 - National Fire Alarm and Signaling Code; Most Recent Edition Cited by Referring Code or Reference Standard.

FF. NFPA 76 - Standard for the Fire Protection of Telecommunications Facilities; 2020.

GG. NFPA 92 - Standard for Smoke Control Systems; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements

HH. NFPA 2001 - Standard on Clean Agent Fire Extinguishing Systems; 2025.

II. UL 38 - Standard for Manual Signaling Boxes for Fire Alarm Systems; Current Edition, Including All Revisions.

JJ. UL 268 - Standard for Smoke Detectors for Fire Alarm Systems; Current Edition, Including All Revisions.

KK. UL 268A - Standard for Smoke Detectors for Duct Application; Current Edition, Including All Revisions.

LL. UL 294 - Access Control System Units; Current Edition, Including All Revisions.

MM. UL 464 - Standard for Audible Signaling Devices for Fire Alarm and Signaling Systems, Including Accessories; Current Edition, Including All Revisions.

NN. UL 521 - Standard for Heat Detectors for Fire Protective Signaling Systems; Current Edition, Including All Revisions.

UL 864 - Control Units and Accessories for Fire Alarm Systems; Current Edition, Including All Revisions.

OO. UL 1076 - Proprietary Burglar Alarm Units and Systems; Current Edition, Including All Revisions.

PP. UL 1449 - Standard for Surge Protective Devices; Current Edition, Including All Revisions.

QQ. UL 1480 - Standard for Speakers for Fire Alarm and Signaling Systems, Including Accessories; Current Edition, Including All Revisions.

RR. UL 1481 - Power Supplies for Fire-Protective Signaling Systems; Current Edition, Including All Revisions.

SS. UL 1638 - Standard for Visible Signaling Devices for Fire Alarm and Signaling Systems, Including Accessories; Current Edition, Including All Revisions.

TT. UL 1711 - Amplifiers for Fire Protective Signaling Systems; Current Edition, Including All Revisions.

UU. UL 1971 - Standard for Signaling Devices for the Hearing Impaired; Current Edition, Including All Revisions.

VV. UL 2017 - General-Purpose Signaling Devices and Systems; Current Edition, Including All Revisions.

WW. UL 2075 - Standard for Gas and Vapor Detectors and Sensors; Current Edition, Including All Revisions.

XX. UL 2610 - Commercial Premises Security Alarm Units and Systems; Current Edition, Including All Revisions.

YY. UL 60950-1 - Information Technology Equipment – Safety – Part 1: General Requirements; Current Edition, Including All Revisions.

ZZ. Title 24 C.C.R.

1.05 ADMINISTRATIVE REQUIREMENTS

AAA. Coordination:

1. Coordinate arrangement of equipment with dimensions and clearance requirements of actual equipment to be installed.
2. Coordinate placement of devices and notification appliances with potential conflicts and view obstructions installed under other sections or by others.
3. Coordinate work to provide power for equipment at required locations.
4. Notify Engineer of conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.06SUBMITTALS

BBB. See Section 013000 - Administrative Requirements for submittal procedures.

CCC. Submittal Documents:

1. Prepare and submit information required for plan review and permitting by AHJ, including but not limited to floor plans, details, and calculations.

DDD. Product Data: Provide manufacturer's standard catalog pages and data sheets for products, including ratings, configurations, standard wiring diagrams, dimensions, finishes, service condition requirements, and installed features.

EEE. Shop Drawings:

1. Comply with NFPA 72 chapter "Documentation," including noting names of installers, Owner(s), and system classification type information.
2. Include plan views, drawn to identified scale, noting locations of fire alarm components and associated building or system coordination, as required by NFPA 72.
3. Include elevations and details of proposed equipment arrangements.
4. Include system interconnection schematic riser diagram showing proposed and approved cable size and type; coordinated with floor plans and describing circuit class, survivability, and application specific information required by NFPA 72.
5. Include typical wiring diagrams for devices, notification appliances, remote indicators, annunciators, remote test stations, and end-of-line and power supervisory devices.
6. Include requirements and control unit diagrams for interfacing with other systems.
7. Indicate system zone boundaries.
8. Include narrative description sequence of operation with input/output matrix.

9. Control Panel: Provide sheet that details exterior and interior views of control panel and clearly shows associated wiring information.
10. Custom Graphic Annunciators: Include proof for approval prior to fabrication.
11. Air-Sampling Smoke Detection Systems: Include air-sampling pipe network layout with sampling ports identified.

FFF. Circuit Calculations:

1. Provide NAC ampacity and voltage drop calculations.
2. EVACS: Provide speaker circuit dB loss calculations for each speaker circuit.
3. Provide standby battery calculations.
4. Air Sampling Smoke Detection Systems: Include calculations demonstrating compliance with specified requirements.

GGG. Inspection and Test Reports:
1. Installer to submit inspection and test plan prior to closeout demonstration.
2. Installer to submit NFPA 72 "Record of Inspection and Testing" forms, stored in cloud based service and available via web browser or file download.

HHH. Installer to submit NFPA 72 "Record of Completion" forms, digitally signed by Owner and authorized representative of AHJ, stored in cloud based service and available via web browser or file download.

III. Project Record Documents:
1. Installer to record actual locations of system components and installed wiring arrangements and routing. Indicate final devices, notification appliances, and terminal identifications.
2. Place in as-built documents cabinets.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Fire Alarm Control Unit and Accessory Equipment - Basis of Design: Notifier INSPIRE Series by Honeywell; www.securityandfire.honeywell.com/notifier/en-us/browseallcategories/control-panel/notifier-inspire-series/#sle.

B. Source Limitations: Where possible, furnish system components and accessories produced by one manufacturer and obtained from one supplier.

2.02 FIRE ALARM SYSTEM

C. Provide new fire alarm system consisting of required components (e.g., equipment, conduit, boxes, wiring, connectors, hardware, supports, accessories, software, and system programming) as necessary for complete operating system that provides functional intent indicated.

D. Products: Listed, classified, and labeled as suitable for purpose intended.

E. Power Sources:
1. Primary: Dedicated branch circuits from facility power distribution system.

2. Secondary: Storage batteries with capacity to operate system for period specified by NFPA 72.
    a. Battery Storage Capacity:
        1) Provide standby (nonalarm) operation sufficient for 24 hours.
        2) Provide additional alarm operation for 15 minutes.
        3) Calculate combined of standby load plus alarm load for overall battery storage capacity requirements, per power supply.
        4) Provide 25 percent additional overall battery capacity correction factor.

F. General Wiring Methods:
1. Pathway class designations and pathway survivability are as defined in NFPA 72.
2. Pathway Class Designations:
    a. Unless otherwise indicated or required, pathways to meet the following requirements:
        1) SLCs: Class B.
        2) IDCs: Class B.
        3) NACs: Class B.
        4) Network Communications: Class B.
3. Pathway Survivability:
    a. Unless otherwise indicated or required, pathways to meet requirements for Pathway Survivability Level 3.
    b. Rated cable to be one of the following in accordance with NFPA 72:
        1) Two-hour fire-rated circuit integrity (CI) or fire-resistive cable.
        2) Two-hour fire-rated cable system (mineral insulated cable).
        3) Two-hour fire-rated enclosure or protected area.
        4) Performance alternative approved by AHJ.

G. Fire Alarm System Interfaces:
1. UL 864 listed unless otherwise indicated.
2. Descriptions below are intended to provide means for interface. See project sequence of operations, narrative, and input/output matrix for execution requirements.
3. Provide addressable monitor modules as indicated or as required for connection to addressable FACU. Unless devices are explicitly permitted to be connected together as one zone, provide separate addressable monitoring points for each device to be individually identifiable by addressable FACU.
4. Provide addressable relay module as indicated or as required to perform necessary functions via dry-contact interface. Where load exceeds module contact rating, provide accessory power isolation relays suitable for load as required.
5. Fire Sprinkler Systems:
    a. Waterflow Switches: Provide minimum of one monitoring point input per switch.
    b. Control Valve Supervisory (Tamper) Switches: Provide minimum of one monitoring point input per switch.
    c. PIV (Post Indicator Valve) or Main Gate Valves: Provide minimum of one monitoring point per switch.
    d. Pressure Supervisory (High/Low Pressure) Switches: Provide minimum of two monitoring point inputs per switch (separate points for high/low pressure signals).
    e. Fire Pumps: Provide minimum of four monitoring point inputs.
    f. Preaction Control Panels: Provide minimum of four monitoring point inputs per system.
    g. Heat Trace (Freeze Protection) Monitoring Systems: Provide minimum of two monitoring point inputs per system.
    h. Freeze Protection: For each sprinkler riser location, provide room temperature sensor to provide supervisory signal to FACU.
6. Fire Suppression Systems:

a. Releasing Service by FACU:
    1) FACU to be listed for releasing service.
    2) Provide addressable releasing control modules as indicated or as required for control of solenoids listed for releasing applications.
    3) Provide manual releasing stations for suppression system activation as indicated.
    4) Provide alarm bells for audible notification as indicated. Interface to dedicated NAC or addressable control module, 24 VDC, supervised. Default operation to be march time pattern on activation of first event, continuous tone on release.
    5) Provide strobes for visible notification as indicated. Interface to dedicated NAC or addressable control module, 24 VDC, supervised. Default operation to be flash on activation of first event, flash on release.
    6) Provide abort switches as indicated.

7. Emergency Responder Communication Enhancement System (ERCES):
    a. Provide minimum of six monitoring point inputs per system.
8. Elevators:
    a. Elevator Emergency Recall Operation:
        1) In each elevator machine room, provide interface for each elevator car or group of elevator cars as determined by AHJ via separate addressable relay modules for each output signal below, where applicable.
            (a) Recall elevator to designated (primary) level.
            (b) Recall elevator to alternate level.
            (c) Smoke detection in elevator machine room (fire fighter's hat light).
9. Access-Controlled Doors:
    a. Door Release:
        1) Provide output signal for release of electrically locked doors via addressable relay module and power isolation relay.
        2) Provide connection to UL 864 listed control system interface or interface with door control power where interruption of control power releases doors.
10. HVAC Systems:
    a. Air Handling Units (AHUs) and Roof Top Units (RTUs):
        1) Provide duct smoke detector on supply side of air stream for units over 2,000 cfm.
        2) Provide duct smoke detector on return side of air stream for units over 15,000 cfm.
        3) Provide remote test station for each duct smoke detector unless explicitly indicated as not required.
        4) Provide output signal to shut down units with at least one duct smoke detector via addressable relay module.
        5) Where fire/smoke dampers are located downstream of unit, provide monitoring point input to determine that unit is not operational and subsequently provide output signal to close such dampers via addressable relay module and power isolation relay.
    b. Energy Recovery Units (ERUs):
        1) Provide duct smoke detector on supply side of air stream.
        2) Provide duct smoke detector on return side of air stream.
        3) Provide remote test station for each duct smoke detector unless explicitly indicated as not required.
        4) Provide output signal to shut down units with at least one duct smoke detector via addressable relay module.
        5) Where fire/smoke dampers are located downstream of unit, provide monitoring point input to determine that unit is not operational and subsequently provide

output signal to close such dampers via addressable relay module and power isolation relay.

11. Fire/Smoke Dampers:
    a. Provide output signal to close fire/smoke damper via addressable relay module and power isolation relay.
    b. Fire/smoke damper activated as indicated on drawings.
        1) By room/area smoke detection (in lieu of duct smoke detection), where area/room is provided with smoke detection throughout and all dampers serving such room/area are activated.
12. Stair Pressurization Fans Used for Active Smoke Control:
    a. Provide hardware necessary to provide required interface signals, including but not limited to fan running verification switches.
    b. Provide duct smoke detector with sampling tube of appropriate length and remote test station.
    c. Provide output signals for the following via addressable relay module and power isolation relay:
        1) Open shaft isolation damper.
        2) Start fan.
    d. Provide monitoring point inputs for the following:
        1) Confirmation of shaft isolation damper open status.
        2) Confirmation of fan operating status.
        3) Roof fan safety disconnect switch in off position fault status.
        4) Variable frequency drive (VFD) abnormal fault status; includes "not in AUTO" and power loss.
    e. System Interface Wiring Methods:
        1) SLCs to/from fans to be wired as Class A (daisy-chain loop, with return, with isolation modules installed as indicated, minimum of one per floor) .
        2) Install wiring associated with fans, including control wiring, in metal conduit.
        3) Provide approved 2-hour fire-rated protection for components pertaining to stair pressurization fans (e.g., wiring, control interfaces, and hardware).
13. Supply and Exhaust Fans Used for Active Smoke Control:
    a. Provide hardware necessary to provide required interface signals, including but not limited to fan running verification switches.
    b. Supply Fans: Provide duct smoke detector with sampling tube of appropriate length and remote test station.
    c. Provide output signals for the following via addressable relay module and power isolation relay:
        1) Open shaft isolation damper.
        2) Start fan.
    d. Provide interface for the following monitoring point inputs:
        1) Confirmation of shaft isolation damper open status.
        2) Confirmation of fan operating status.
        3) Roof fan safety disconnect switch in off position fault status.
        4) Variable frequency drive (VFD) abnormal fault status; includes "not in AUTO" and power loss.
    e. System Interface Wiring Methods:
        1) SLCs to/from fans to be wired as Class A (daisy-chain loop, with return, with isolation modules installed as indicated, minimum of one per floor) .
        2) Install wiring associated with fans, including control wiring, in metallic conduit.
        3) Provide approved 2-hour fire-rated protection for components pertaining to active smoke control fans (e.g., wiring, control interfaces, and hardware).

H. Units with Sleeping Areas:

1. Devices Within Units:
   a. Use fire alarm system-connected addressable devices for local unit detection/alarm (in lieu of single- and multiple-station alarms) and for building fire alarm event notification.
   b. Local Unit Detection/Alarm:
      1) Provide low frequency sounder bases for detectors (smoke and carbon monoxide as indicated).
      2) Smoke Detector Activation:
         (a) Provide dedicated local unit supervisory signal to fire alarm system (separate from carbon monoxide detection).
         (b) Activate low-frequency sounder bases within same unit to provide NFPA 72-compliant temporal 3 pattern.
         (c) Detector Restoration: Device activation to automatically restore to normal condition when smoke chamber obscuration levels drop below activation threshold.
      3) Carbon Monoxide Detector Activation:
         (a) Provide dedicated local unit carbon monoxide supervisory signal to fire alarm system (separate from smoke detection).
         (b) Activate low-frequency sounder bases within same unit to provide NFPA 72-compliant temporal 4 pattern.
         (c) Detector Restoration: Device activation to latch and only restore to normal condition upon reset command from FACU.
      4) Hearing-Impaired Units:
         (a) Provide strobe (either in combination with sounder or separate device) in each legally-defined bedroom (177 cd), each living area (minimum 75 cd), and each bathroom (minimum 75 cd). Interface to dedicated NAC or addressable control module, 24 VDC, supervised.
         (b) Where unit includes both smoke and carbon monoxide detection, provide strobe labeled "ALERT" in lieu of "FIRE."
      5) Synchronize notification appliances (sounders and strobes) within unit with each other.
      6) Exclude local unit detection/alarm from any fire alarm system bypass/disable operation.
   c. Building Fire Alarm Event Notification:
      1) Provide low frequency sounders in each unit as indicated and as required to achieve minimum of 75 dB at pillow in legally-defined bedrooms and 15 dB over ambient in other interior areas of unit.
      2) In lieu of providing separate low frequency sounders, system may activate detector low frequency sounder bases provided under local unit detection/alarm above.
      3) Hearing-Impaired Units: Use strobe provided for local unit detection/alarm above.
      4) Synchronize notification appliances (sounders and strobes) within unit with each other and with common area notification appliances on same floor.
      5) FACU to control activation mapping, silencing, and restoration.

2.03 FIRE ALARM CONTROL UNIT AND RELATED EQUIPMENT

I. Provide system listed and labeled as complying with agency listings and approval requirements as follows:
   1. UL 864 (Control Units and Accessories for Fire Alarm Systems).
   2. UL 2017 (General-Purpose Signaling Devices and Systems).
   3. UL 2610 (Commercial Premises Security Alarm Units and Systems).
   4. FM (AG) (FM approved).
   5. City of Chicago.
   6. Fire Department of New York (FDNY).
   7. California State Fire Marshall (CSFM).

J. Provide cabinets and enclosures as indicated or as required to house system components.

K. Fire Alarm Control Unit (FACU):

   1. SLCs:
      a. Expandable enclosure, up to ten SLCs.
         1) Supporting up to 3180 devices (1590 detectors and 1590 modules) configurable for Class B or Class A with signaling loop modules.
         2) Configured with with voice and networking capability.
   2. FACU User-Interface:
      a. Provide high-definition 10-inch (254 mm) 1024 X 600 color touchscreen display.
      b. Include audible and visible feedback with adjustable brightness solid-state LCD.
      c. Include graphical QWERTY-style keypad on color, touchscreen display when alfa-numeric input is required.
      d. Provide capability to scroll events by type using touchscreen (e.g., fire alarm, supervisory alarm, and trouble).
      e. Permit uploading of custom background image.
      f. Include ability to display up to 3,000 events in order of priority and time of occurrence.
      g. Provide event counters to indicate total number of events by type.
      h. Passwords and Users:
         1) Support five access levels (e.g., system operator, building maintenance user, technician user, admin user, master user) and up to 50 usernames and passwords.
         2) Each role level access has default customizable permissions.
         3) Only master password allows password change.
      i. Custom Actions:
         1) Messages: Provide means of entering up to 100 custom action messages, up to 160 characters each, with ability to assign any of 100 messages to any point.
         2) Button: Support up to 32 programmable custom action buttons on LCD touchscreen display used to enable/disable or control outputs without use of additional hardware.
      j. Support up to ten remote LCD displays. See "Remote LCD Display" below.
      k. Support display of events, from up to two additional nodes, without additional hardware or licensing.
      l. Capable of displaying of all network events if configured as network control display, without additional hardware.
   3. Provide FACU based on licensing model to allow for future expansion.

a. Support licensable features to expand logical operations and features for FACU and display functionality.
b. Support SLC expansion from one up to ten, using same FACU central processing unit and without need to be replaced or upgraded.

4. Online, Offline, or Remote Programming:
   a. Provide means to program panel either through offline software utility program nonlocal to panel or connected online remotely via secured gateway.
   b. Support upload/download of programmed database to personal computer (PC) or cloud storage.
5. History Events:
   a. Support software maintained history file for last 10,000 events; each with time and date stamp with ability to scroll through stored events.
   b. Include alarms, troubles, operator actions, and programming entries.
   c. Provide ability to filter and sort history by event type, date, or point range.
6. Service Mode:
   a. Provide ability to remotely access FACU for programming, testing, and control.
   b. Include customizable time-out feature.
   c. Trouble condition is displayed while in this mode.
7. Support AV magnet test with compatible AV appliances. Provide ability to test individual AV appliances on NAC by applying magnet to appliance momentarily; test does not activate entire circuit, minimizing disruptions during testing and inspection.
8. Support self-testing detector capability.
9. Logical Operators:
   a. Support logical functions, including at minimum: AND (ALL), OR (ANY), NOT, ONLY1, COUNT (one-nine), and TIMERS.
   b. Inputs for Operators: Time of day, addressable devices, software points, and trouble codes.
   c. Capable of differentiating operator inputs by specific device status (i.e., fire alarm, prealarm, nonalarm, disable, supervisory, and security).
10. Virtual Points
    a. The panel will support the creation of up to 511 virtual points capable of activating user-defined signals on the fire alarm display including fire alarm, supervisory, trouble, and security.
    b. Each virtual point will be capable of:
       1) Incorporating unique 40-character custom label.
       2) Activating unique software zones and panel outputs.
       3) Selectively reported to the central station as unique point.
       4) Activation by Software Zones or Logical Zones.

11. SLC Device Sub-addressing

    a. Combination detectors will support operations for each sensing technology independently.
       1) Active sensing technology is clearly visible on each user interface along with the associated panel response (Alarm, Supervisory, etc)
       2) Single combination detector allows for cross-zoning its separate sensing elements for releasing and similar applications.
       3) A sensing technology will be capable of being turned off or ignored via system programming.
    b. Fire Service Access Elevator Implementation (FSAE)
       1) UL 864 Listed for FSAE application.

2) Capable of reporting alarms from thermal detectors while simultaneously monitoring temperature between 65 degrees F (18 degrees C) and 135 degrees F (57 degrees C).
3) Multicriteria detectors includes unique sub-addresses for normal, monitoring, and unsafe temperatures as well as alarm detection.
4) Each sub-address for FSAE status is capable of latching until reset or tracking real-time status.
5) Each sub-address for FSAE status capable of independent mapping for activation of status LEDs.
6) NORMAL temperature is assumed by the system while the temperature remains below the MONITORING temperature.
7) The MONITORING and UNSAFE temperatures is configurable in steps of 5 degrees.
   (a) Default MONITORING temperature is 90 degrees Fahrenheit.
   (b) Default UNSAFE temperature is 135 degrees Fahrenheit.

12. Smoke Control

a. UL 864 UUKL Listing.
b. Capable of creating up to 650 user-defined logical smoke control appliances (SC Appliance) corresponding to individual building mechanical components to be controlled and/or monitored by the buildings fire alarm control unit.
   1) Each SC Appliance will:
      (a) Have a unique 40-character label
      (b) Be configurable for operation as either dedicated for smoke control or shared (non-dedicated) with building HVAC automation.
      (c) Monitor operation of the appliance (i.e. damper opened, damper closed, fan on/running, fan off, door opened) through addressable monitor modules.
      (d) Control the appliance through addressable control modules.
      (e) Be capable of monitoring additional fault states through monitor modules such as:
         (1) Trouble
         (2) AC Failure
         (3) Service Disconnect status
      (f) Allow for a unique user customizable fault delay timer up to 255 seconds.
c. Capable of creating up to 650 local smoke control zones (SC Zone) for controlling multiple smoke control appliances.
   1) SC Zones are configured with one or more operations including:
      (a) PRESSURIZE
      (b) PURGE.
      (c) EXHAUST
   2) Each SC Zone:
      (a) allows for ISOLATE and TEST configurations.
      (b) Automatically report the operating and fault statuses without the need of manually creating additional logical functions.
      (c) Allow for customizable scenarios for weekly testing of equipment per SC Appliance.
   3) Associations of appliance states per SC Zone are made via a simple input-output matrix format.
   4) SC Zones are capable of lockout by first-in or last-in priority to prevent conflicting configurations.

13. Releasing Service via Addressable Releasing Control Modules:

a. Agent Releasing:
    1) FACU to be capable of supporting 10 releasing zones for independent hazards, with each zone capable of three cross-zone and four abort options; provide adjustable delay and discharge timers.
b. Water Releasing:
    1) FACU support for 100 water releasing zones.
        (a) Up to 10 input sources either local panel or across fire alarm network.
c. Addressable Releasing Control Modules: See "Addressable Modules" in this article below.
d. Manual Release Station: See "Manual Pull Stations" under "Fire Alarm System Initiating Devices" article below.
e. Bells and Strobes: See "Fire Alarm System Notification Appliances" article below.

14. Support up to 80 addressable panel annunciators. See "Addressable Panel Annunciators" below.
15. FACU Main Power Supply:
    a. Provide addressable main power supply with universal input to accept either 120/240 VAC, 60 Hz, supplying all necessary power for FACU.
    b. Include minimum four integral and programmable NACs.
        1) Provide onboard patterns, zone coding, and synchronization (System Sensor, Wheelock, and Gentex).
    c. Supply power distribution of each addressable main power supply that can be customizable to provide power for system, NAC, supporting circuits, auxiliary, and battery charging.
    d. Up to three addressable main power supplies may be added within one FACU to expand power capacity.
    e. Power supply supports up to 210 AH batteries.
16. Provide modular dress-panel and door design with interchangeable hinge locations.
    a. Provide doors capable of reversible (left or right) hinge and lock.
    b. Provide doors with interchangeable grey trim.
17. Basis of Design Products:
    a. Notifier INSPIRE Series Model CPU-N16LD (N16x) expandable to 10 SLCs with 10-inch (254 mm) touchscreen display, and power supply with four NACs premounted on chassis compatible with CAB-5 enclosure.
    b. Notifier Model PMB-AUX; up to two additional power supplies, one charging batteries, each supporting up to four NACs each.
    c. Notifier CAB-5 Series enclosure with door for mounting; include required dress plates and finish trims.
    d. Notifier Model SLM-318; signal loop module.

L. Emergency Voice/Alarm Communications System (EVACS) Panel:

1. Provide system listed and labeled as complying with UL 864.
    a. Provide the following additional agency listings and approval requirements:
        1) UL 464 (Audible Signaling Devices for Fire Alarm and Signaling Systems, Including Accessories).
        2) UL 1481 (Power Supplies for Fire-Protective Signaling Systems).
        3) UL 1638 (Visible Signaling Devices for Fire Alarm and Signaling Systems, Including Accessories).
        4) UL 1711 (Amplifiers for Fire Protective Signaling Systems).
        5) UL 1971 (Signaling Devices for the Deaf and Hard of Hearing).

6) UL 60950-1 (Information Technology Equipment - Part 1: General Requirements).

2. Provide digital voice command center located with FACU and containing equipment required for audio control, signaling and supervisory functions. This includes speaker zone indication and control, EVACS controller, and master microphone
3. Provide EVACS Controller which is field programmable without requiring return of components to manufacturer and without requiring use of external computers or other programming equipment.
   a. Capable of supporting up to eight channels of simultaneous audio; each identified evacuation zone to allow broadcast of automatic audio or manual paging independent of other evacuation zones.
   b. Provide factory recorded "library" of voice messages and tones in standard .WAV file format, which may be edited and saved on PCs running current Windows operating system.
   c. Capable of control and supervision of 32 distributed digital amplifiers or 16 bulk digital distribution boards.
   d. Provide communication channel which allows connection to digital amplifiers via manufacturer-approved multi-mode fiber optic media. Communications loop to be considered part of fire alarm system network and meet specified requirements for wiring methods and pathway survivability.
   e. Include auxiliary input for external 1 Vrms audio source (e.g., music, and paging), configurable to mute during emergency events and power loss.
4. Provide switch points of command as follows, unless otherwise approved by Engineer and AHJ:
   a. All-Call: Provides manual paging for all zones simultaneously.
   b. Total Evacuation: Provides complete building-wide activation of audio and visual evacuation signals; restore on switch deactivation, signal silence, or system reset command.
   c. Provide minimum of two switch points of manual controls per evacuation zone for manual paging and/or manual evacuation.
      1) Manual Evacuation: Activate audio and visual evacuation signals on selected zone. Restore on switch deactivation, signal silence, or system reset command.
      2) Manual Paging: Where active evacuation zone is selected, pause evacuation signal for manual page. Resume evacuation signal upon completion of paging function unless silence or reset command has been initiated.
   d. In addition to required emergency messaging, provide switch points of command for minimum of three prerecorded messages for nonemergency all-call notifications including "event has cleared", "testing of system", and "clear from testing of system".
   e. Provide minimum of six switch points of command for speaker bypass, visual bypass, elevator recall bypass, door control bypass, HVAC bypass, and auxiliary bypass.
5. Audio Transponders:
   a. Audio hardware, including amplifiers, speaker circuit interfaces, power supplies, supervision hardware, cabinets, and battery backup systems may be configured to support multiple notification zones and packaged as audio transponders.
   b. Transponders to be considered system control equipment and located, installed, and interfaced accordingly.
   c. Components mounted in transponders to be listed and approved for installed configuration.
   d. Provide maximum speaker circuit lengths with minimum signal loss for both current scope and future expansion consideration; maximum signal loss of minus 3 dB per speaker circuit, utilizing 70 Vrms audio for speaker circuits.
6. Distributed Digital Audio Amplifiers:

a. Interface with EVACS controller via individual address to allow for dedicated communication of audio, activation, and fault status.
b. Provide minimum quantity of two integrated speaker circuits per amplifier, each with unique system sub-address to allow for individual activation, control, and fault supervision. Systems that utilize addressable control or relay modules to provide speaker circuits are not permitted.
c. Provide capability to charge or supervise batteries and allow for inherent ground fault detection.
d. Provide capability for local mode alarm trigger for local activation and broadcast of evacuation tone on integrated speaker circuits in event of communication loss with system control hardware.
e. Include auxiliary input for external 1 Vrms audio source (e.g., music, and paging), configurable to mute during emergency events and power loss.
f. Provide capability to communicate detailed status of faults and conditions affecting operation of amplifiers and individual circuits. Systems that combine audio and communication into single points via addressable modules or other hardware are not permitted.
g. Provide dedicated backup amplifier board for each primary amplifier.

7. Basis of Design Products:
   a. Notifier Model DVC-EM; digital multi-channel voice evacuation (EVACS) system integrated with FACU.
      1) Notifier Model DVC-KDB; voice control keypad for DVC-EM with status indicators and 24 user-programmable buttons.
      2) Fiber optic communication modules:
         (a) Notifier Model DS-FM; multi-mode fiber optic module for digital audio communications.
   b. Distributed Digital Audio Amplifiers:
      1) Notifier Model DAA2-5070; 50 W, 70 Vrms amplifier with four Class B or two Class A speaker circuits
      2) Fiber Optic Communication Modules:
         (a) Notifier Model DS-FM; multi-mode fiber optic module for digital audio communications.
      3) Backup Amplifier/Dual Channel Boards:
         (a) Notifier Model BDA-70V; 70 Vrms backup amplifier card.

M. High-Speed Networking:
1. LAN network architecture; peer-to-peer based firmware package, inherently regenerative communication format and protocol.
2. Support of up to 200 network nodes Class B or Class X operation with data communications rate of 12 Mbps (wire) or 100 Mbps (fiber).
3. Support high-speed network communications cards including ability to use multimode fiber optic cable.
4. Networks with Multimode Fiber Media:
   a. Support 62.5/125 micrometer fiber (10 dB limit) or 50/125 micrometer fiber (6.5 dB limit).
   b. Provide terminal box at each node for fiber demarcation.
5. Provide network capable of single channel digital voice and firefighters telephone, as well as panel-to-panel (same network media; wire and/or fiber) communications.
6. Basis of Design Products:
   a. High-Speed Networks with Multimode Fiber Media: Notifier Model HS-NCM-MF high-speed network communications module, fiber optic cable interface. Requires multi-mode 62.5/125 or 50/125 micrometer fiber.

N. Alarm Transmission and Integration:

1. Integrated Gateway:

   a. FCC compliant.
   b. Provide gateway for connection to fire system panel or panel network, serving as interface between FACU, supervising/central station, cloud services and peripheral devices.
   c. Able to read connected device system database for individual FACU or network of panels and automated report creation for supervising/central station.
   d. Enable automatic supervising/central station setup without need for manual transfer of information to associate reporting codes with fire system points.
   e. Reduce transfer times to supervising/central stations, dispatch centers, and emergency responders by eliminating need for additional transmission equipment (e.g., alarm-capture devices, and dialers) and associated processing delays while increasing reliability and accuracy of alarm transmission.
   f. Enable detailed context sharing directly with first responders upon fire event to improve emergency response efficiency.
   g. Capable of alarm transmission over AT&T or Verizon cellular networks. Selection of which cellular network will be user configured using communication modules selected based on strongest cellular signal available at location.
   h. Capable of alarm transmission over Ethernet or Wi-Fi networks.
   i. Enable integration directly to private radio communicator via Ethernet connection
   j. Enable supplementary transmission of real-time data from fire alarm system to cloud service to enable remote monitoring of events via web application or mobile device application.
   k. Support IP-based gateway to enable fire alarm panel or network of panels to be connected to PC-based graphical monitoring workstation via Internet or LAN.
   l. CLSS Gateway: Serves as gateway between workstation software and proprietary fire alarm network, uses that workstation as primary reporting station for proprietary fire alarm network, and translates proprietary fire alarm network's panel and device data into data that can be interpreted proprietary workstation software application.
   m. Proprietary Connection to Cloud-Based Testing and Inspection Platform:
      1) Provide automated reports which comply with:
         (a) NFPA 10 (Standard for Portable Fire Extinguishers).
         (b) NFPA 25 (Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems).
         (c) NFPA 72 (National Fire Alarm and Signaling Code).
         (d) NFPA 2001 (Standard on Clean Agent Fire Extinguishing Systems).
      2) Support ability to generate automated commissioning reports or test and inspection reports for installation or test and inspection personnel via cloud platform.
      3) Reports should be stored in cloud, enabling appropriate stakeholders to retrieve test and inspection report immediately after completion of system commissioning or test and inspection.
      4) Log and report method in which device disposition was captured; either by event received from connected gateway, barcode scan, or manual user entry.
      5) Automatically capture addressable devices connected to system ensuring that each addressable device is accounted for and tested. Include feature to automatically report devices as "passed" upon testing.

6) Allow importing of nonaddressable devices associated with system to ensure system devices are accounted for and tested.
7) Enable mobile service compatible with IOS and Android and have web-based access with Windows and MAC-based platforms without need to install software on dedicated network server.

n. Provide lockable plastic cabinet which is keyed identical to FACU.

2. Basis of Design Products:

a. Integrated Gateway; Honeywell Model HON-CGW-MBB (CLSS gateway with enclosure) with Model 50160636-001 (keylock and cable kit) with support for monitoring via Rapid-Response-enabled supervising/central station.
1) Integrated Gateway Cellular Modules: CCM-ATT-HON; AT&T cellular communication module or CCM-VZ-HON; Verizon cellular communication module.
2) Cloud-Based Testing and Inspection Platform: Honeywell CLSS.

O. PC-Based Graphical Life Safety Monitoring System:

1. System Description:

a. Connect UL 864 listed PC and software (monitoring and control) to Fire Alarm System, include interface devices to enable a fully functional system.
b. System includes, but not limited to, touch screen or LED wide screen monitor, connection to one PC-based graphical workstation(s), input/output devices, network communications media, auxiliary control devices, power supplies, and wire/fiber optic media as indicated on drawings.
c. Support variety of topologies and media, as well as provide industry-standard open architecture transport layer protocol.
d. Provide email functions capability to send graphical system information and real-time off-normal event notifications via email server to designated email accounts.
e. Provide supervised interface to Honeywell FACUs.
1) Electrically supervise system and monitor integrity of conductors.
f. Comply with requirements of NFPA 72 for Proprietary Signaling System Receiving Unit, except as modified and supplemented by this specification.
g. UL listed application software and hardware complete and ready for operation:
1) UL 294 (Access Control System Units).
2) UL 864 (Control Units for Fire Protective Signaling Systems).
3) UL 1076 (Proprietary Burglar Alarm Units and Systems).
4) UL 2017 (General-Purpose Signaling Devices and Systems).
h. Allow mixture of technologies and manufacturers' equipment to operate on same network and provide operator with consistent look and operation for monitored equipment.
i. Using standard RS-232 ports on existing and future monitoring and control systems used by facility, system connects to and interprets status change data transmitted from ports and provides graphic annunciation, control, history logging and reporting.
j. Support Boolean logic for automatic event response.
1) Automated event response application provided to automatically perform actions across entire system based on network activity.
2) Event response application event responses or actions based on predefined user conditions using simplified Boolean logic.

3) Actions configured to be executed immediately or timed required.

k. Capability to page directly from workstation to any DVC installed on network.

l. Include interface to digital alarm communicator receivers for wide area network monitoring.

2. System Performance:

a. Network interface and reporting of individually monitored system's status via user-friendly graphical user interface (GUI) based software workstation.

b. Software to operate under Microsoft Windows 10 Enterprise 64-bit operating system as manufactured by Microsoft Corporation.

c. GUI based software capable of graphically representing each facility being monitored with floor plans and icons depicting actual locations of various systems; and sensors' locations as well as view system events in text mode.

d. Minimum resolution of 1920 X 1080 GUI display capable of showing enlarged floor plan views, key map representative of larger floor or site plan views, relationships of monitored facilities, current operator, number of fire, supervisory, prealarms, troubles, and security events within network as well as outstanding events and acknowledged events.

e. Software capacity of at least 1,000 screens/floor plans or as dictated by hard drive space and installed video and random access memory (RAM) for efficient operation.

f. Provide ability to float and dock windows to support dual monitors display.

g. Support graphic printing of data including graphical floor plans, system activity, history, and guidance text. Windows-compatible printer supported for graphics and report printer options.

h. Workstation software provides automatic navigation to screen containing icon that represents system or sensor in event of off-normal conditions.

i. System/sensor icon to indicate type of off-normal condition, flash, and change to color associated with off-normal condition (e.g., RED for ALARM, and YELLOW for TROUBLE).

j. Allow attachment of text (TXT) files, sound (WAV) files, image (BMP) files, and video (AVI) files to each system or sensor icon allowing additional information to be provided to system operator for responding to off-normal conditions. Software file attachment ability for each major event type, per device.

k. Allow importation of externally developed floor plans in Drawing Exchange Format (DXF), Windows Metafile (WMF), JPEG (JPG), Graphics Interchange Format (GIF) and Bitmap (BMP) format.

l. Provide automatic navigation to screen containing icon of system, sub-system, or individual sensor when events are initially annunciated. Operator navigation to screens containing outstanding events accomplished by selecting events from both acknowledged or unacknowledged events.

m. History Manager: Record system events with time and date stamp as well as current system operator's name.

1) Provide ability to store off-normal events experienced by various sub-systems that are monitored by system.

2) Events recorded with time and date stamp and system operator provided with ability to log predefined response or custom comment for each off-normal event and have that comment stored in history file with time, date, and operator name.

3) Provide ability to conduct searches and generate subsequent reports, based on all events for single system/device address, specific node, specific type of off-normal condition and date range (mm/dd/yy to mm/dd/yy) or combinations of

these search parameters. Number of entries in history file that match determined search criteria will be displayed.
4) Automatically back-up history file at 2.5 million events.
5) Provide ability to preselect data fields for reporting and then save report as template, as well as schedule predefined report to print at designated time.
6) Provide operator ability to select number of days or number of months to back-up history.

n. Alarm Monitoring: Provide for continuous monitoring of off-normal conditions regardless of current activity displayed on screen.
1) If operator is viewing history of sub-system and alarm condition occurs, system automatically navigates to graphic screen showing area where off-normal event is occurring.
2) Prioritize off-normal events defined by NFPA 72 into categories (e.g., fire alarms, troubles, supervisory alarms, prealarms, and security alarms).
3) Display running count of events by type in alarm summary window. Alarm summary window includes at least five counters, defaulted to alarm, prealarm, trouble, security, and supervisory events.
4) Show running list of unacknowledged events and acknowledged events and allow operator to acknowledge event by selecting on that event in unacknowledged events box. Unacknowledged and acknowledged events boxes contain abbreviated description of off-normal condition.
5) Details of condition may be viewed by selecting event in unacknowledged events box.
6) Allow attachment of user-definable text files, image files, video files, and sound files to each device/system monitored (for every event state) to facilitate operators and response personnel's response to off-normal condition.
7) Record events to system's hard drive. Minimum of 2.5 million events may be stored.

o. Provide ability to generate reports based on system history.
p. Allow system operator to enter custom comments up to 255 characters for each event and have those comments recorded in system history files.
q. Password protect software and provide for definition of security profiles for operator access control.
r. Software to contain provision for defining monitoring profiles of preselected nodes for monitoring. This includes provision for status types within selected nodes.
s. Includes configuration tool providing the following features:
1) Create and edit graphics.
2) Set up gateway connections and define their roles.
3) Set system operating mode.
4) Add and edit objects on screens.
5) Configure colors and sounds for status classes.

t. Gateway interfaces to have ability to be constructed in redundant configuration by having multiple Honeywell CLSS gateways on one network, monitored by multiple workstation clients.
u. Support live voice paging for mass notification to fire alarm voice evacuation system over Internet Protocol (IP).
v. Non-Cloud-Connected, Monitor and Control Aspects of System Software:
1) Ability to monitor and control Notifier ONYX and INSPIRE Series fire alarm panels using Honeywell CLSS gateway interface.
2) Sub-system not to rely on network for data processing required to perform their particular function. Each individual sub-system continues operation should disruption in communication with system be experienced.

3. Workstation:

    a. Minimum Requirements: IBM compatible Intel I7 processor on Microsoft Windows 10 OS platform. 16 GB of random access memory (RAM), solid-state hard drive with no less than 240 GB of storage space, minimum of 64 MB of video RAM, internal supervisory CPU watchdog board with audible annunciator, 100 Base-T Ethernet network interface card (NIC), 104-key keyboard, and mouse type pointing device with center wheel.
    b. Support one or more Windows-compatible printers located and connected to each workstation for graphics and report printing.
    c. Fire Alarm System Printers: Support one Notifier Model PRN-7, 80-column dot matrix tractor feed industrial grade printer for event and date-stamped printouts of off-normal events and status changes per workstation.
    d. Workstation industrial-grade computer listed for UL 864 (Control Units for Fire-Protective Signaling Systems). Workstation capable of annunciation of all fire detection points.
    e. Support dual monitors and be supplied with 23-inch flat screen (610 mm) LED monitor(s) with integrated speakers.
    f. Alarm annunciation to appear on all workstations and may be silenced at each local workstation.
    g. System and associated equipment manufactured by single ISO 9001 U.S. manufacturer, or division thereof.
    h. Computer capable of networking to additional computers and these computers capable of operating as workstations and/or gateways for local area or wide area networks.

4. Fire System Monitoring Network:

    a. See "High-Speed Networking" in PART 2 above.

5. Integration Network:

    a. Workstation Network:
        1) Multiple workstation computers networked using Ethernet supporting use of TCP/IP protocol for local area systems.
        2) Network capable of supporting multiple clients (e.g., workstations, configuration applications, and automated response applications), and Honeywell CLSS gateways.
        3) Provide UL listed system components to communicate between clients and gateways over business computer network (shared IP).
        4) Supply UL listed Ethernet hub for connection of multiple workstations, gateways, clients, and network printers.

6. Basis of Design Products:

    a. Notifier ONYXWorks; UL-listed PC and software which connects to peer-to-peer fire alarm system network and provides control and monitoring.
        1) Notifier ONYXWKS-HNMF; UL-listed PC, ONYXWorks View+Ctrl+Paging software, high-speed multi-mode fiber PC card; UL-listed monitor and mic not included.

2) Notifier NOTIFY-IP; UL-listed microphone, audio supervisor board and audio cables.
3) Honeywell MON-23LCDW; 23-inch (610 mm) UL-listed Wide-Screen LED, WSXGA.

P. Addressable Panel Annunciators:

1. Comply with UL 864.
2. Provide plug-in terminal blocks for wiring connections.
3. Buttons and indicators capable of custom programming up to 60 points of annunciation.
4. Provide trichromatic LEDs (RGB) for custom colors as follows: red, green, yellow, white, amber, blue, cyan, or purple.
5. Include 30 pushbuttons with two corresponding LEDs each.
6. Each pushbutton and LED can be programmed independently for different points or grouped with other indicators for cooperative operation.
7. Provide reindication of alarm or trouble by resounding and flashing when new conditions occur.
8. Provide local sounder for alarm and trouble conditions; include programming option to silence/acknowledge by pushbutton.
9. Capable of speaker control mode with integrated voice and FACU, allowing remote control for groups of multi-channels mapped to groups of multi-speakers.
10. Basis of Design Products:
    a. Notifier Model ACM-30 fully customizable annunciator; independently configured buttons; up to 60 points; programmable LEDs.
        1) Notifier Model CAB-4 or CAB-5 dress panel or compatible backbox for mounting.

Q. Lamp Driver Modules:

1. Provide module with 60 LED outputs and 21 switch inputs per module for interface with graphic annunciators.
2. May be located up to 6,000 feet (1828 m) from FACU.
3. Inputs programmable for:
    a. System acknowledge
    b. Signal silence
    c. Reset
    d. Initiate drill
    e. Control or disable panel or SLC output point, software point, or audio control point
    f. Smoke Control Functions
        1) Smoke Control Appliance Control On/Open or Off/Close
        2) Smoke Control Appliance Control Automatic
        3) Smoke Control Zone Purge, Pressurize, Exhaust, or Isolate
        4) Capable of beings assigned one of up to 5 priority levels per module to enable multiple interface panels.
4. Switches configurable as momentary or toggle.
5. Support 5 VDC or 24 VDC LEDs.
    a. Each LED output capable of steady and flashing operation.
6. Basis of Design Products:
    a. Notifier Module LDM2-60 lamp driver module.

R. Remote LCD Display:

1. Comply with UL 864.
2. Capable of mimicking display of either FACU or network control display, based on connection or only information per specific zones.
3. Provide plug-in terminal blocks for wiring connections.
4. Provide 5-inch (127 mm) capacitive full color touchscreen LCD annunciator that displays all system events.
5. Block Acknowledge: Support block acknowledge for trouble and disable conditions.
6. Provide programmer key switch for user authentication, providing ability to enable control inputs for acknowledge, silence, reset, and drill.
7. Provide configurable control buttons that are operational only when keyswitch is unlocked.
8. Provide six programmable buttons, each with descriptor/label, status indicator and configurable action (on/off, disable/enable).
9. Capable of being field programmed using PC configuration software.
    a. Provide standard USB-C connection for software interface.
10. Basis of Design Products:
    a. Notifier Model RLD network control annunciator, 5-inch (127 mm) color touch screen display; mounts in standard 3-gang backbox.

S. Network Control Display:

1. Comply with UL 864.
2. Capable of displaying information and controls similar to main FACU primary display (i.e., device type identifiers, individual point alarm, trouble or supervisory, zone, and custom alpha labels).
3. Provide plug-in terminal blocks for wiring connections.
4. Logical Operators:
    a. Support logical functions, including at minimum: AND (ALL), OR (ANY), NOT, ONLY1, COUNT (one-nine), and TIMERS.
    b. Inputs for Operators: Time of day, addressable devices, software points, and trouble codes.
    c. Capable of differentiating operator inputs by specific device status (i.e., fire alarm, prealarm, nonalarm, disable, supervisory, and security).
5. Support up to 80 addressable panel annunciators. See "Addressable Panel Annunciators" above.
6. Support up to five remote LCD displays. See "Remote LCD Display" above.
7. Fully field-programmable to display specific panels or all nodes on fire system network.
8. Capable of manually requesting point status information, disabling system inputs, and altering state of system outputs.
9. Provide high-definition 10-inch (254 mm) 1024 X 600 color touchscreen display.
10. Capable of displaying all events from all INSPIRE nodes in fire system network.
11. Capacity to display intelligent system points and information for all events on fully utilized network of at least 300,000 points.
12. Provide history buffer capable of storing up to 10,000 events.
13. Provide color-coded notification icons based on event type.
14. Include audible and visible feedback with adjustable brightness solid-state LCD.
15. Include graphical QWERTY-style keypad on color, touchscreen display when alfa-numeric input is required.
16. Provide capability to scroll events by type using touchscreen (i.e., fire alarm, supervisory alarm, and trouble).
17. Permit uploading of custom background image.

18. Provide event counters to indicate total number of events by type.
19. Provide standard USB connections for interfacing with PC-based software or USB devices, including USB-C, USB-Micro, and USB-A.
20. Passwords and Users:
    a. Support five access levels (e.g., system operator, building maintenance user, technician user, admin user, master user) and up to 50 usernames and passwords.
    b. Each role level access has default customizable permissions.
    c. Only master password access password change screens.
21. Custom Buttons: Support up to 32 programmable custom action buttons on LCD touchscreen display used to enable/disable or control outputs without use of additional hardware.
22. Basis of Design Products:
    a. Notifier Model NCD network control display 1024 X 600 10-inch (254 mm) color touch screen display.
        1) Notifier Model NBB-2 backbox (recessed- or surface-mounting capability).

T. Notification Appliance Circuit (NAC) Expansion:

1. Comply with UL 864.
2. Where NAC requirements exceed capacity of FACU, provide accessories as required for expansion.
3. Cabinet-mounted with capacity for providing 10 A 24 VDC notification appliance power and 7 Class B NAC outputs.
    a. Include self-contained, lockable cabinet capable of storing 7 or 18 AH batteries.
    b. Battery charger capacity capable of charging 7 AH to 33 AH sealed lead acid batteries.
    c. Provide three activation inputs which allow for synchronization pass-through and can be associated with any combination of NAC outputs.
4. Where Class A NACs are required, provide Class A module to enable each NAC to be configured as Class A.
5. Provide integral synchronization of both audio and visual circuits to match protocol assigned by FACU.
6. Basis of Design Products:
    a. Honeywell Model HPF-PS10; 10 A notification power expander with seven 24 VDC individually configurable outputs, red metal enclosure.
        1) ZNAC-PS Class A output converter module.

U. Electromagnetic Door Holders:
1. Select according to door type and associated installation conditions.
2. Basis of Design Products:
    a. Honeywell Model FM Series; model number selected according to application.

2.04 FIRE ALARM SYSTEM INITIATING DEVICES

V. General Requirements:

1. Addressable Devices: Individually identifiable by addressable FACU; suitable for connection to FACU SLCs. Provide address-setting means on device using rotary

switches with simple numerical indicators. Devices which require proprietary tools or dip switches to address device will not be accepted.

2. Conventional (Nonaddressable) Devices: Provide addressable monitor modules or two-wire detector zone modules (See "Addressable Interface Modules" article for Basis of Design Products) as indicated or as required for connection to addressable FACU. Unless devices are explicitly permitted to be connected together as one zone, provide separate addressable monitoring point for each device in order to be individually identifiable by addressable FACU.
3. Provide devices and associated accessories suitable for intended application and location to be installed. Unless otherwise indicated, use addressable devices and addressable monitor modules only in clean, dry, indoor, nonhazardous locations.
4. Surface-Mounted Devices: Provide manufacturer's accessory surface mount backboxes or suitable outlet/device box.
5. Devices for Outdoor and Damp/Wet Locations: Weatherproof, suitable for outdoor use; provide manufacturer's accessory backboxes and enclosures in accordance with product listing.
6. Devices for Hazardous (Classified) Locations: Listed and labeled as suitable for classification of installed location.

W. Self-Testing Devices:

1. Capable of CLSS identifying issues associated with integrity or ability for smoke detector to properly detect smoke (e.g., dust cap not removed or tampering with detector by obstructing smoke chamber.
2. Capable of providing functional and smoke entry tests using self-test function.
   a. Detector transmits 'wireless beacon activated' only during self-test mode.
   b. Designed to communicate with CLSS app to prove successful completion of visual inspection.

X. Manual Fire Alarm Boxes (Pull Stations):

1. Description: Noncoded manual signaling boxes listed and labeled as complying with UL 38.
2. Alarm Initiation: Configured for general alarm initiation unless otherwise indicated; presignal stations (where indicated) require use of key to initiate general alarm.
3. Operation: Dual-action unless otherwise indicated; first requires pushing in then pulling down of lever.
4. Color: Red, in accordance with NFPA 72.
5. Station Reset: Requires use of key or tool.
6. Basis of Design Products:
   a. Manual Pull Stations:
      1) Notifier Model NBG-12LX addressable manual pull station, indoor rated, dual-action, key lock.

Y. Spot-Type Detectors:

1. Addressable Detectors:
   a. Comply with "General Requirements for Addressable Devices."
   b. Provide LED indication of normal operation/regular communication with FACU condition.

c. Furnished with output for remote LED alarm indicator.
d. Utilizes plug-in mounting to separate base with tamper-resistant feature; compatible with available sounder, relay, and isolator bases; provide base as indicated or as required.

2. Smoke Detectors:
   a. Listed and labeled as complying with UL 268.
   b. Use photoelectric (light-scattering) principal to measure smoke density.
   c. Provide data to FACU representing analog level of smoke density.
   d. Self-Testing Smoke Detectors:
      1) Self-generate controlled amount of smoke into chamber, testing optic response to real smoke simulation.
      2) Detector measures dilution of smoke within set time limits to determine if there is masking preventing smoke from entering chamber.
      3) Generate detector alarm condition upon smoke entering chamber.
      4) Detector generates trouble condition if testing chamber is blocked.
3. Thermal (Heat) Detectors:
   a. Listed and labeled as complying with UL 521.
   b. Listed for tenability monitoring when used with FSAE applications.
   c. Self-Testing Thermal (Heat) Detectors:
      1) Self-generate energy into internal thermistor, allowing register heat identification.
      2) Detector measure cooling of heating element after cycle complete.
      3) Generate detector alarm condition upon introduction of heat from thermistor.
      4) Detector generates trouble condition if thermistor does not detect heat.
4. Carbon Monoxide Detectors:
   a. Listed and labeled as complying with UL 2075.
   b. Comply with requirements for addressable detectors unless otherwise noted for areas where addressable devices are not feasible.
   c. Furnished with end-of-life notification.
5. Combination and Multi-Criteria Detectors:
   a. Comply with respective requirements for each detection method.
   b. Capable of generating unique events per detection method.
   c. Self-Testing Multi-Criteria Detectors: Comply with respective self-testing requirements.
6. Detector/Base Color: White, unless otherwise indicated.
7. Basis of Design Products:
   a. Smoke Detectors:
      1) Notifier Model FSV-951R addressable high-sensitivity smoke detector, photoelectric; very early warning fire detection (VEWFD) capability; integral drift compensation, self-diagnostics, transient rejection, local test via application of external magnet.
      2) Notifier Model FSP-951-SELFT self-test addressable smoke detector, indoor rated, photoelectric.
   b. Thermal (Heat) Detectors:
      1) Notifier Model FST-951H addressable thermal detector, indoor rated, fixed temperature, 190 degrees F (88 degrees C), RTI rating of QUICK or better, local test via application of external magnet.
      2) Notifier Model FST-951R addressable thermal detector, indoor rated, fixed temperature 135 degrees F (57 degrees C) and rate-of-rise, 15 degrees F (8.3 degrees C) per minute, local test via application of external magnet.
      3) Notifier Model FST-951-SELFT self-test addressable thermal detector, indoor rated.

c. Carbon Monoxide Detectors:
d. Combination/Multi-Criteria Detectors:
    1) Notifier Model FSP-951T-SELFT self-test addressable smoke/thermal detector, indoor rated.
e. Bases for Addressable Detectors:
    1) Notifier Model B300-6 Series standard base, flanged low-profile.

Z. Duct Smoke Detectors:

1. Listed and labeled as complying with UL 268A.
2. Sampling Tubes: Select as required for installation in duct to be monitored.
3. Remote Test Stations: Provide remote test station for each duct smoke detector unless explicitly indicated as not required. Unless otherwise indicated, use remote test stations only in clean, dry, indoor, nonhazardous locations.
4. Basis of Design Products:
    a. Addressable duct smoke detector assembly for indoor applications consisting of the following:
        1) Notifier Model DNR duct smoke detector housing, indoor rated.
            (a) Notifier Model FSP-951R addressable smoke detector, indoor rated, photoelectric, remote test capable.
            (b) Notifier DST Series sampling tube of appropriate length.
    b. Addressable duct smoke detector assembly for outdoor applications consisting of the following:
        1) Notifier Model DNRW duct smoke detector housing, weatherproof.
            (a) Notifier Model FSP-951R addressable smoke detector, indoor rated, photoelectric, remote test capable.
            (b) Notifier DST Series sampling tube of appropriate length.
            (c) Notifier Model DH400OE-1 weatherproof enclosure for housing components listed above. Fill interior of enclosure with appropriate insulation media to minimize condensation.
    c. Notifier Model RTS151KEY remote test station for addressable detectors; allows for detector test (via external magnet application) and key reset; provides LED indication of alarm condition.

AA. Beam Smoke Detectors:

1. Listed and labeled as complying with UL 268.
2. Provide coverage for 16 to 328 feet (5 to 100 m) standard.
3. Use advanced smoke imaging techniques to avoid false alarms from partial and sudden blockage from foreign object intrusion.
4. Provide automatic drift compensation and sensitivity threshold level settings.
5. Provide four automatic sensitivity levels (25, 30, 40, and 50 percent).
6. UL listed operating temperature from 32 degrees F (100 degrees F).
7. Provide paintable cover.
8. Basis of Design Products:
    a. Notifier Model FS-OSI-RI addressable beam video-imaging detector, single-ended reflected beam type with transmitter unit and reflector; protection range of 16 to 328 feet (5 to 100 m) with standard reflector; beam adjustment angle of plus/minus 10 degrees. Furnish accessories as indicated or as required.

b. Notifier Model RTS151KEY remote test station for addressable detectors; allows for detector test (via external magnet application) and key reset; provides LED indication of alarm condition.

BB. Air-Sampling Smoke Detection Systems:

1. Design and provide smoke detection system suitable for application and coverage area indicated, consisting of smoke detector unit with aspirator/fan that continuously draws air into sensing chamber through connected sampling pipe network and associated sampling ports.
2. Comply with NFPA 72 and list and label as complying with UL 268.
3. Comply with applicable requirements of NFPA 76 for very early warning fire detection (VEWFD).
4. Detector Unit:
   a. Sensitivity: Programmable; capable of meeting NFPA 76 requirements for Very Early Warning Fire Detection (VEWFD) even if system is designed and programmed for to be less stringent.
   b. Smoke Detection Method: Laser-based light scattering mass detection.
   c. Alarm Levels: Programmable; as indicated or as required to perform alert, prealarm action, and alarm functions; minimum of four.
   d. Allow aspirated detector and SLC module firmware upgrade in field lowering maintenance and upgrade cost during potential field issues.
   e. Display: Provides local annunciation of detector trouble and alarm status.
5. Sampling Pipe Network:
   a. Use manufacturer's recommended sampling pipe and fittings; plenum rated; identified in accordance with NFPA 72.
   b. Designed using manufacturer's product-specific design software or based on manufacturer's pre-engineered design suitable for intended application.
6. FACU Interface:
   a. Communicates up to five levels of events to FACU via SLC interface for display and use in control-by-event system programming.
   b. Allows access to real-time status information at FACU including alarms and faults.
7. Basis of Design: Xtralis VESDA-E Aspirating Smoke Detection.
   a. Xtralis VESDA-E VEP Series; Model VEP-A00-1P-NTF-VN: Addressable, single pipe, coverage up to 10,760 sq feet (1,000 sq m).
   b. Xtralis VESDA-E VEP Series; Model VEP-A10-P-NTF-VN: Addressable, four pipes, 3.5-inch (89 mm) LCD display, coverage up to 21,520 sq feet (2,000 sq m).
   c. Xtralis VESDA-E VEP Series; Model VEP-A00-P-NTF-VN: Addressable, four pipes, coverage up to 21,520 sq feet (2,000 sq m).
   d. Xtralis VESDA-E VEU Series; Model VEU-A10-NTF-VN: Addressable, four pipes, 3.5-inch (89 mm) LCD display, coverage up to 69,965 sq feet (6,500 sq m).
   e. Xtralis VESDA-E VEU Series; Model VEU-A11-NTF-VN: Addressable, four pipes, coverage up to 69,965 sq feet (6,500 sq m).
   f. Xtralis VESDA-E VEA Series; Model VEA-040-A00-NTF-UL: Addressable, four pipes, coverage up to 36,000 sq feet (3,345 sq m) .
   g. Xtralis VESDA-E VEA Series; Model VEA-040-A10-NTF-UL: Addressable, four pipes, 3.5-inch (89 mm) LCD display, coverage up to 36,000 sq feet (3,345 sq m).
   h. Xtralis VESDA-E VES Series; Model VES-A00-P-NTF-VN: Addressable, four pipes, increased alarm thresholds and relay outputs, autoLearn (smoke/flow), coverage up to 21,520 sq feet (2,000 sq m).

i. Xtralis VESDA-E VES Series; Model VES-A10-P-NTF-VN: Addressable, four pipes, 3.5-inch (89 mm) LCD display, increased alarm thresholds and relay outputs, autoLearn (smoke/flow), coverage up to 21,520 sq feet (2,000 sq m).

2.05 FIRE ALARM SYSTEM INTERFACE MODULES

CC. Fire alarm system accessory equipment listed and labeled as complying with UL 864.

DD. Provide addressable interface modules as indicated or required for fire alarm and nonfire alarm interfaced systems.

EE. Individually identifiable by addressable FACU; suitable for connection to FACU SLCs. Provide address-setting means on device using rotary switches with simple numerical indicators. Devices which require proprietary tools or dip switches to address device will not be accepted.

FF. Provide addressable modules suitable for connection to FACU SLCs.

GG. Unless otherwise indicated, use addressable modules only in clean, dry, indoor, nonhazardous locations.

HH. Addressable Monitor Modules: Unless devices are explicitly permitted to be connected together as one zone, provide separate addressable monitor module for each conventional dry-contact input device in order to be individually identifiable by addressable FACU.

II. Addressable Control Modules: Provide as indicated or as required for selective control of notification appliances.

JJ. Addressable Releasing Control Modules: Provide as indicated or as required for control of listed solenoids in releasing applications.

KK. Addressable Relay Modules: Provide as indicated or as required to perform necessary functions via dry-contact interface. Where load exceeds module contact rating, provide accessory power isolation relays suitable for load as required.

LL. Addressable Signaling Line Circuit (SLC) Isolating Modules: Provide as indicated or as required to automatically isolate short circuits on connected sections of SLC loops and allow other sections to continue to function normally. Provide automatic reset upon correction of short circuit.

MM. Basis of Design Products:

1. Addressable Monitor Modules:

a. Notifier Model FMM-1 addressable monitor module; single monitoring point, supervises one Class A or Class B circuit of conventional dry-contact input devices; uses single module address on SLC; mounts to nominal 4-inch (102 mm) square or 2-gang box, includes white finish cover.
b. Notifier Model FDM-1 addressable monitor module; two monitoring points, supervises two Class B circuits of dry-contact input devices; uses two module addresses on SLC; mounts to nominal 4-inch (102 mm) square or 2-gang box, includes white finish cover.
c. Notifier Model FMM-101 addressable monitor module, miniature; single monitoring point, supervises one Class B circuit of conventional dry-contact input devices; suitable for installation within appropriately sized device box behind monitored unit; uses single module address on SLC.
d. Notifier Model FZM-1 addressable two-wire detector zone module; single zone monitoring point, supervises one Class A or Class B zone of compatible two-wire

conventional smoke detectors; requires separate 24 VDC power; uses single module address on SLC; mounts to nominal 4-inch (102 mm) square or 2-gang box, includes white finish cover.

e. Notifier Model XP10-M addressable multi-monitor module; ten monitoring points, supervises ten Class B circuits of dry-contact input devices; uses ten module addresses on SLC; mounts to CHS-6 chassis within enclosure.
f. Notifier Model XP6-MA addressable multi-monitor module; six zone monitoring points, supervises six Class A or three Class B zones of compatible two-wire conventional smoke detectors; requires separate 24 VDC power; uses six module address on SLC; mounts to CHS-6 chassis within enclosure.

2. Addressable Control Modules:

   a. Notifier Model FCM-1 addressable control module; single supervised control output, Class A or Class B, suitable for controlling 24 VDC NAC and speakers up to 70.7 Vrms; requires separate power; uses single module address on SLC; mounts to nominal 4-inch (102 mm) square or 2-gang box, includes white finish cover.
   b. Notifier Model XP6-C addressable multi-control module; six Class B or three Class A supervised control outputs, suitable for controlling 24 VDC NAC and speakers up to 70.7 Vrms; requires separate power; uses six module addresses on SLC; mounts to CHS-6 chassis within enclosure.
3. Addressable Releasing Control Module:
   a. Notifier Model FCM-1-REL addressable releasing control module; single supervised solenoid release output, Class A or Class B, suitable for connection to one 24 VDC solenoid or up to two 12 VDC solenoids (in series) listed for releasing service; utilizes redundant protocol; requires separate 24 VDC power; uses single module address on SLC; mounts to nominal 4-inch (102 mm) square or 2-gang box, includes white finish cover.
4. Addressable Relay Modules:
   a. Notifier Model FRM-1 addressable relay module; two Form C dry contacts that switch together; uses single module address on SLC; mounts to nominal 4-inch (102 mm) square or 2-gang box, includes white finish cover.
   b. Notifier Model XP6-R addressable multi-relay module; Six individually programmable Form C dry contacts; uses six module addresses on SLC; mounts to CHS-6 chassis within enclosure.
5. Addressable Multi-Input/Output Modules:
   a. Notifier Model FDRM-1 addressable multi-input/output module; two monitoring points, supervises two Class B circuits of dry-contact input devices; two Form C dry contacts that operate independently; uses up to four module addresses on SLC; mounts to nominal 4-inch (102 mm) square or 2-gang box, includes white finish cover.
6. Addressable Signaling Line Circuit (SLC) Isolating Modules:
   a. Notifier Model ISO-X addressable signaling loop circuit (SLC) isolating module; does not use any module addresses on SLC; mounts to nominal 4-inch (102 mm) square or 2-gang box, includes white finish cover.
   b. Notifier Model ISO-6 addressable signaling loop circuit (SLC) isolating module; does not use any module addresses on SLC; mounts on CHS-6 chassis within enclosure.
7. Accessories:
   a. Notifier Model PR-1 power isolation relay for loads exceeding relay module contact ratings; operating voltage of 18-35 VDC, 18-35 VAC, or 120 VAC; LED visible indication of relay coil energization.

2.06 FIRE ALARM SYSTEM NOTIFICATION APPLIANCES

NN. Notification Appliances - General Requirements:

1. Provide signaling devices listed for fire-protective service and intended operating mode (public or private); suitable for connection to FACU notification NAC.
2. Provide addressable control modules as indicated or as required for selective control of notification appliances.
3. Provide notification appliances and associated accessories suitable for intended application and location to be installed. Use notification appliances only according to listed mounting (i.e., ceiling or wall mounted).
4. Surface-Mounted Notification Appliances: Provide manufacturer's accessory surface mount backboxes or suitable outlet/device box.
5. Notification Appliances for Outdoor and Damp/Wet Locations: Weatherproof, suitable for outdoor use; provide manufacturer's accessory backboxes and enclosures in accordance with product listing.
6. Notification Appliance Derating: Account for device derating adjustments in accordance with listing where applicable, including but not limited to the following.
   a. Where accessory protective guards, and enclosures are utilized.
   b. Where required by field conditions (e.g., ambient temperature).
7. Notification Appliances Colors:
   a. See mounting configuration indicated by floor plan drawing symbols.
   b. Wall-Mounted: White.
   c. Ceiling-Mounted: White.

OO. Visible Notification Appliances:

1. Public Mode Operation: Listed and labeled as complying with UL 1971.
2. Strobes: Clear or nominal white lens with flash rate of 1 Hz unless otherwise indicated or required; xenon light source with maximum pulse duration of 0.2 seconds; candela rating as indicated.

PP. Audible Notification Appliances:

1. Listed and labeled as complying with UL 464.
2. Rated Sound Pressure Level: As required to achieve design sound pressure levels, but not less than 75 dB(A) at 10 feet (3.1 m) for public mode operation or 45 dB(A) at 10 feet (3.1 m) for private mode operation in accordance with UL 464.
3. Low-Frequency Sounders: Listed for producing low frequency (520 Hz) alarm signal for sleeping areas in accordance with NFPA 72; selectable tone, including at minimum NFPA 72-compliant temporal 3 pattern and continuous.

QQ. Speakers for Emergency Voice/Alarm Communications Systems (EVACS):

1. Listed and labeled as complying with UL 1480.
2. Rated Sound Pressure Level: As required to achieve design sound pressure levels, but not less than 75 dB(A) at 10 feet (3.1 m) in accordance with UL 1480.

3. Frequency Range: 400 to 4,000 Hz minimum in accordance with UL 1480; listed for producing 520 Hz low frequency alarm signal for sleeping areas in accordance with NFPA 72.
4. Speaker Voltage: Field-selectable (25 Vrms, 70.7 Vrms); matched to audio distribution circuit.
5. Furnished with minimum of four field-selectable power taps.

RR. Combination Notification Appliances: Comply with respective requirements for each signaling method.

SS. Basis of Design Products:

1. Strobes:
   a. Notifier Model SWLED strobe, indoor rated, wall-mounted, white, selectable candela output (15, 30, 75, 95, 110, 135, 185 at 24 VDC nominal).
   b. Notifier Model SGWLED strobe, compact, indoor rated, wall-mounted, white, selectable candela output (15, 30, 75, 95, 110, 135, 185 at 24 VDC nominal).
   c. Notifier Model SWK strobe, weatherproof (includes backbox), wall-mounted, white, selectable candela output (15, 15/75, 30, 75, 95, 110, 115 at 24 VDC nominal).
   d. Notifier Model SCWLED strobe, indoor rated, ceiling-mounted, white, selectable candela output (15, 30, 75, 95, 115, 150, 177 at 24 VDC nominal).
   e. Notifier Model SCWKLED strobe, weatherproof (includes backbox), ceiling-mounted, white, selectable candela output (15, 15/75, 30, 75, 95, 110, 115 at 24 VDC nominal).
   f. Notifier Model SCWHKLED-P strobe, plain, weatherproof (includes backbox), wall-mounted, white, selectable candela output (135, 150, 177, 185 at 24 VDC nominal).

2. Low-Frequency Sounders:
   a. Notifier Model HWL-LF low-frequency sounder, indoor rated, wall-mounted, white.
   b. Notifier Model HGWL-LF low-frequency sounder, compact, indoor rated, wall-mounted, white.
   c. Notifier Model HCWL-LF low-frequency sounder, compact, indoor rated, ceiling-mounted, white.

3. Speakers:
   a. Notifier Model SPWL speaker, indoor rated, wall-mounted, white.
   b. Notifier Model SPWK speaker, weatherproof (includes backbox), wall-mounted, white.
   c. Notifier Model SPCW8 speaker, dual-voltage, indoor rated, ceiling-mounted, white.
   d. Notifier Model SPCWK speaker, weatherproof (includes backbox), ceiling-mounted, white.

4. Speaker/Strobes:
   a. Notifier Model SPSWL speaker/strobe, indoor rated, wall-mounted, white, selectable candela output (15, 30, 75, 95, 110, 135, 185 at 24 VDC nominal).
   b. Notifier Model SPSWK speaker/strobe, weatherproof (includes backbox), wall-mounted, white, selectable candela output (15, 15/75, 30, 75, 95, 110, 115 at 24 VDC nominal).
   c. Notifier Model SPSCWL speaker/strobe, indoor rated, ceiling-mounted, white, selectable candela output (15, 30, 75, 95, 115, 150, 177 at 24 VDC nominal).

d. Notifier Model SPSCWK speaker/strobe, weatherproof (includes backbox), ceiling-mounted, white, selectable candela output (15, 15/75, 30, 50, 75, 95, 110, 115 at 24 VDC nominal).

2.07 FIRE ALARM SYSTEM ACCESSORIES

TT. Cables for Network Connections:
1. Comply with manufacturer's minimum requirements.

UU. Fire Alarm System Documents and Software Cabinet:
1. Provide fire alarm document (FAD) cabinet with size as indicated or as required.
2. Cabinet: Steel with red finish; permanently identified with text "FIRE ALARM SYSTEM DOCUMENTS"; keyed to match fire alarm system equipment; include fixed integral minimum 2 GB flash drive for electronic storage of system documents and system database program

VV. Terminal Cabinets:
1. Provide terminal cabinets with quantity of termination points as indicated or as required for application.
2. Cabinet: Steel, with red finish; permanently identified with text "FIRE ALARM TERMINAL CABINET"; keyed to match fire alarm system equipment.
3. Terminal Strips: Rated for 20 A at 250 VAC; terminal points rated for 12 AWG conductors.

WW. As-Built Document Cabinets:
1. Provide as-built document cabinet with size as indicated or as required.
2. Cabinet: Steel with red finish; permanently identified with text "AS-BUILT DRAWINGS"; keyed to match fire alarm system equipment.

XX. Framed Passive Graphic Maps:
1. Provide appropriately-sized passive graphic map of protected premises that identifies:
   a. Location and address of system addressable input devices.
   b. Room numbers or descriptions for rooms with addressable devices or notification appliances, matching field applied labels.
   c. Current location (labeled "YOU ARE HERE").
   d. North reference.
2. Provide concealed mounting hardware.

YY. Emergency Access Key Vaults:
1. Listed; complying with requirements of AHJ.
2. Unless otherwise indicated, utilize recess mounting for new construction and surface-mounting for existing structures.
3. Color: Black, unless otherwise indicated or directed by Engineer.

ZZ. Surge Protection:
1. Line Voltage Surge Protection: UL 1449 listed; provide for each line voltage circuit that supplies operating power for fire alarm system control equipment (e.g., FACU, field booster panels, nodes, and transponders).
2. Low Voltage Surge Protection: Listed, voltage/current ratings suitable for circuit to be protected; provide for each power limited low voltage circuit that exits protected premises.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that characteristics of system components are consistent with indicated requirements.

C. Verify that mounting surfaces are ready to receive system components.

D. Verify that circuit wiring installation is completed, tested, and ready for connection to system where applicable per conductor requirements of NFPA 72 tables located in chapter "Inspection, Testing, and Maintenance."

E. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

F. Install products in accordance with NFPA 72, CEC, state and local codes, manufacturer's instructions, and as indicate on drawings.

G. Install products in accordance with applicable requirements of NECA 1 (general workmanship).

H. Adjust selectable candela strobes to rating indicated on design documents.

I. Provide grounding and bonding in accordance with manufacturer's recommendations; see Section 260526.

J. Install firestopping to preserve fire resistance rating of partitions and other elements; see Section 078400.

K. Identify system wiring, components, and overcurrent protective devices for branch circuits serving fire alarm system; see Section 260553.

L. Conceal conduit, junction boxes, and conduit supports and hangers in finished areas. Conceal or expose conduit, junction boxes, and conduit supports and hangers in unfinished areas; maintain code required access.

M. Do not install smoke detectors before system programming and test period. If construction is ongoing during this period, take measures to protect smoke detectors from contamination and physical damage.

N. Mount fire detection and alarm system devices, control panels, and remote annunciators flush or surface as indicated.

O. Ensure installation locations of devices and notification appliances are in accordance with local codes, standards, and ensure manual stations are suitable for surface mounting or semi-flush mounting as indicated on drawings. Install not less than 42-inches (1.07 m), nor more than 48-inches (1.22 m), above finished floor measured to operating handle.

END OF SECTION

SECTION 31 10 00
SITE CLEARING

PART 1 - GENERAL

1.01 SUMMARY

A. Contractor shall furnish all labor, materials, services, testing, transportation and equipment necessary for the completion of all site clearing work as required and as indicated on drawings and specified herein. Work materials and equipment not indicated or specified which is necessary for the complete and proper operation of the work of this Section in accordance with the true intent and meaning of the contract documents shall be provided and incorporated at no additional cost to the Owner.

B. Removal of surface debris; removal of paving and curbs; removal of trees, shrubs, and other plant life; topsoil excavation; and repair of damaged vegetation and/or irrigation systems/system components.

C. Removal of concrete and bituminous surfacing.

1.02 RELATED SECTIONS

A. Section 31 20 00: Earthwork.

1.03 REFERENCE STANDARDS

A. The work provided herein shall conform to and be in accordance with the Contract Plans, General Conditions/Specifications and Special Provisions, as well as the Standard Specifications for Public Works Construction ("GREENBOOK"), 2024 Edition, adopted by the Southern California Chapter, American Public Works Association; herein referred to as the "Standard Specifications".

1.04 REGULATORY REQUIREMENTS

A. The Contractor shall obtain all necessary permits, licenses, or agreements required by any legally constituted agency, pay for all fees and give all necessary notices required for the construction of the work. The School District shall reimburse the contractor for all necessary permits or inspection fees by any legally constituted agency.

B. Perform all work of this Section in strict accordance with applicable Government Codes and Regulations especially meeting all safety standards and requirements of CAL/OSHA, and the City of Lake Elsinore. Provide additional measures, added materials and devices as may be needed as directed by the District Representative at no added cost to the Owner.

C. Comply strictly to Rule 1404, South Coast Air Quality Management District.

B. Coordinate clearing Work with utility companies.

PART 2 – PRODUCTS

2.01 Satisfactory Soil Materials: Requirements for satisfactory soil materials are specified in Section 31 20 00 – Earthwork.

A. Obtain approved borrow soil materials off-site when satisfactory soil materials are not available on-site.

PART 3 - EXECUTION

3.01 PREPARATION

A. Verify that existing plant life designated to remain is tagged or identified.

B. Identify a waste area for placing removed materials.

3.02 PROTECTION

A. Protect existing structures and site improvements indicated to remain, from damage by approved methods and/or as authorized by the District Representative. Removal of all protections shall be when work of this Section is completed or when so authorized by the District Representative.

B. Protect Existing Utilities indicated or made known to remain traversing the job-site and serving existing adjacent facilities.

C. Protect Existing Trees and Shrubs indicated to remain by providing temporary surrounding fencing so located a sufficient distance away so that trees and shrubs will not be damaged by site-clearing operations.

1. Protection Barrier: A protection barrier shall be installed around the shrubs or trees to be preserved. The barrier shall be constructed of a durable fencing material, such as plastic construction fencing, snow fence, or chain link. The barrier shall be placed at or beyond the drip line. "Drip line" as referred to herein means a line which may be drawn on the ground around the tree directly under its outermost branch tips and which identifies that location where rainwater tends to drip from the tree. Placement of barrier to be approved by District Representative (Grounds Supervisor). If barrier is placed inside the drip line, then 3/4 inch plywood must be placed over the root zone up to the drip line. The fencing shall be maintained in good repair throughout the duration of

the project, and shall not be removed, relocated, or encroached upon without permission of the District Representative (Grounds Supervisor).

2. Storage of Materials: There shall be NO storage of materials or supplies of any kind within the area of the protection barriers. Concrete, cement, asphalt materials, block, stone, sand and soil shall not be placed within the drip line of the tree(s).

3. Fuel Storage: Fuel storage shall NOT be permitted within 150 feet of any tree to be preserved. Refueling, servicing and maintenance of equipment and machinery shall NOT be permitted within 150 feet of protected trees.

4. Vehicles/equipment: NO parking or driving of vehicles or storage of equipment shall be permitted within the drip line of any tree to be preserved.

5. Debris and Waste Materials: Debris and waste from construction or other activities shall NOT be permitted within protected areas. Wash down of Concrete, cement or asphalt handling equipment, in particular shall NOT be permitted within 150 feet of protected areas.

6. Grade Changes: Grade changes can be particularly damaging to trees. Any grade changes should be approved by the District Representative (Grounds Supervisor) before construction begins and precautions taken to mitigate potential injuries.

7. Damages: Any damages or injuries to the preserved trees (including pruning or cutting of such trees not in conformity with the International Society of Arboricultural Pruning Guidelines and ANSI A300 Pruning Standards) shall be reported immediately to the District Representative (Grounds Supervisor). Severed roots shall be pruned cleanly to healthy tissue, using proper pruning tools. Broken branches/limbs shall be pruned according to International Society of Arboricultural Pruning Guidelines and ANSI A300 Pruning Standards. In the event that any damage, injury, improper pruning or cutting of a protected tree is deemed to be so substantial as to require its replacement (such determination to be made in the sole discretion of the District Representative), Contractor shall replace such tree with the same species and variety of tree, up to a box size of 48 inches, or if no such replacement is available, with a substitute species or variety as determined in the sole discretion of the District Representative. Any replacement tree shall be approved in advance by the District Representative. The value of the tree to be replaced shall be determined by a Certified Arborist selected by Contractor from the District's approved list of Registered Consulting Arborists. To the extent that the value of the replaced tree as determined by the Certified Arborist exceeds the cost of the replacement tree, Contractor shall be liable to District for such difference in value in addition to all costs associated with replacement of the damaged tree.

8. Removal of Existing Tree or Shrub: Prior to removing or cutting any trees designated for removal, the contractor shall coordinate with the District's Ground Supervisor. In the event that Contractor, a Subcontractor, Sub-Subcontractor, material supplier or anyone else performing the Work of the Contract willfully, negligently or mistakenly removes any tree or shrub not designated for removal, Contractor shall immediately report such removal to the District Representative (Grounds Supervisor). Contractor shall replace such tree with the same species and variety of tree, up to a box size of 48 inches, or if no such replacement is available, with a substitute species or variety as determined in the sole discretion of the District Representative. Any replacement tree shall be approved in advance by the District Representative. The value of the tree to be replaced shall be determined by a Certified Arborist selected by Contractor from the District's approved list of Registered Consulting Arborists. To the extent that the value of the replaced tree as determined by the Certified Arborist exceeds the cost of the replacement tree, Contractor shall be liable to District for such difference in value in addition to all costs associated with replacement of the damaged tree.

9. Unauthorized Tree Removal or Injury: Criminal Penalties: Reference is made to California Penal Code §384a which provides that any person who willfully or negligently cuts, destroys, mutilates or removes any tree or shrub or portion thereof growing on public land without a written permit from the owner of said public land is guilty of a misdemeanor, subject to a fine of up to $1,000, imprisonment in county jail for up to 6 months, or both. Contractor is advised that, in addition to all remedies provided herein and in the Contract Documents, the District shall cooperate with appropriate authorities in prosecuting and enforcing Penal Code §384a and other criminal sanctions as appropriate concerning trees and shrubs located on District property.

10. Preventive Measures: Before construction begins fertilization of the affected areas to be applied at a rate to be determined by the District Representative (Grounds Supervisor).

D. Protect bench marks, survey control points, and existing structures from damage or displacement.

E. Protection of Persons and Property (existing structures and site improvements):

1. Provide barricades, warning signs at open depressions and holes on adjacent property and public accesses.

2. Provide operating warning lights during hours from dusk to dawn each day or as otherwise required.

3. Protect existing remaining structures, utilities, sidewalks, pavements other facilities from damage as caused by settlement, undermining, washout or other hazards created by site-clearing operations of this Section.

F. Use means necessary to prevent dust from becoming a nuisance to the public, to neighbors and to others performing work on or near the job-site.

G. Maintain access to the job-site at all times.

3.03 CLEARING

A. Clear areas required for access to site and execution of Work.

B. Remove all rubbish and debris existing and resulting from work operations of this Section as soon as possible, do not allow to pile up. Do not burn rubbish and debris on the job-site.

C. Where active utility lines need to be capped or plugged, perform such work in accordance with requirements of the Utility Company.

3.04 REMOVAL

A. Remove debris, rock, and extracted plant life from site.

B. Excavate and remove associated plumbing piping.

C. Prior to demolition work, the Contractor shall notify the District Representative to identify the existing items for salvage purposes. The materials identified for salvage shall be returned to the District in a timely manner agreed upon by the District Representative.

3.05 CONCRETE AND BITUMINOUS SURFACE REMOVAL

A. Where noted on the construction drawings, break up and completely remove all existing concrete surfacing, curbs, gutters, walks and bituminous surfacing to limits indicated to be removed. All cutting shall be done to a neat and even line with proper tools or a concrete cutting saw. Minimum depth of cut shall be 1-1/2", unless otherwise specified. Remove any concrete broken beyond the indicated limits to the nearest joint or score line and replace with new concrete to match the existing.

B. Removed concrete and bituminous materials shall be disposed of off-site unless otherwise noted on the construction drawings. All such items to be removed shall be disposed of off the property in a legal manner.

C. Bituminous pavement saw cutting shall conform to the provisions of Section 300-1.3.2 (a) of the Standard Specifications. The residue resulting from the saw cutting operations shall not be permitted to flow beyond the specific work location and shall be removed the same day.

D. Removal of concrete curb / curb & gutter covered by this section shall include saw-cutting and removal of a twelve (12") inch wide section of the adjacent bituminous pavement.

E. When saw cutting concrete curb / curb & gutter, the cuttings shall be continuously wet vacuumed to prevent the materials from entering catch basins, storm water conveyances, or waters of the State. Vacuumed cuttings shall be disposed of according to applicable regulations.

F. Concrete curb and concrete curb and gutter shall be removed to the lines, grades and locations shown on the plans in accordance with Section 300-1.3.2 of the Standard Specifications.

G. Concrete removal in sidewalk and driveway areas shall extend to existing score lines unless specifically indicated otherwise on the Plans or in the Project Special Provisions, or unless otherwise approved by the Engineer.

H. Reinforcing or other steel may be encountered in portions of concrete to be removed. No additional compensation will be allowed for the removal of concrete containing reinforcing or other steel.

I. In those areas where existing bituminous surfacing is removed to make way for new planting or lawn areas, remove soil 6” below existing exposed soil surface. Removed soil may be used only as fill under buildings or other areas to be paved, only if approved by the District Inspector. Legally dispose of off site, if material is not approved as fill material.

3.06 REPAIRS

A. During demolition and construction, ensure that trees, shrubs and other plant material and vegetation are protected inside and outside of the work zone and that the vegetation is being watered, maintaining the proper moisture content according to the season. Failed vegetation, including sod, due to lack of water, and/or plant material destroyed during construction period are to be replaced to equal or better size and condition at no additional cost to the District.

B. If the irrigation system is damaged or modified during construction, it shall be repaired to the Districts standards, and shall be in equal or better condition than prior to damage or modification. All repairs shall be, inspected and approved by the District Representative (Grounds Supervisor) prior to backfilling or covering of said repairs. The

District representative requires forty-eight hours prior notice, when contractor requests inspection of completed repairs. All repairs shall be made so as to ensure proper operation prior to the close of the contract at no additional cost to the District.

C. Controller Wires: If damaged, cut or removed, repair by splicing, soldering and silicone sealing. To ensure proper operation, reconnect the wires to the valve to correspond with the map on the controller to the correct station.

D. Hydraulic Tubes: If damaged/cut or removed, repair by replacing the tubing using equal or better material.

E. Valves: If damaged, repair/replace with equal or better material. All valves are to be flushed/cleaned thoroughly.

F. Mainlines: If damaged, repair/replace with equal or better material. All lines are to be flushed/cleaned thoroughly.

G. Lateral Lines: If damaged, repair/replace with equal or better material. All lines are to be flushed/cleaned thoroughly.

H. Irrigation Heads: If damaged, repair/replace with equal or better material. All heads are to be flushed and filters cleaned thoroughly.

I. Controllers: If damaged repair/replace with equal or better material.

J. Backflow Prevention Devices: If damaged, repair/replace with equal or better material.

K. Gate/Ball/Quick Coupler Valves: If damaged repair/replace with equal or better material.

L. Valve Boxes: If damaged, repair/replace with equal or better material. Concrete boxes and concrete lids with the appropriate markings for identification shall be used. The top of the box shall be buried below finish grade, equal to existing depth or deeper. The top of the valve stems shall be 6" below the underside of the top of the box.

M. Construction in grass areas: Sod shall be removed by sod cutting at a soil depth of 2", stored on site, and watered on a daily basis. Upon completion of work, stored sod shall be reinstalled over the areas disrupted due to construction. An option may be to bypass cutting the sod, however at the completion of the project, finish grading and installation of new Hybrid Bermuda GN -1 sod over the areas disrupted by construction shall be required.

3.07 EXCESS MATERIALS DISPOSAL

A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials, including trash and debris, and legally dispose of them off Owner's property.

3.08 SITE CLEANUP

A. Cleanup of branches, limbs, logs, or any other debris resulting from any operations shall be promptly and properly accomplished. The work area shall be kept safe at all times until all operations are completed. Under no circumstances shall the accumulation of brush, limbs, logs, or other debris be allowed in such a manner as to result in a hazard to the public. All debris shall be cleaned up each day before the work clew leaves the site, unless permission is given by the Owner to do otherwise. All lawn areas shall be raked, all streets and sidewalks shall be swept, and all brush, branches, rocks or other debris shall be removed from the site. Areas are to be left in a condition equal to or better than that which existed prior to the commencement of operations.

END OF SECTION

SECTION 31 20 00
EARTHWORK

PART 1 - GENERAL

1.01 SUMMARY

A. The work of this section shall include excavation, unclassified cut, unclassified fill, removing existing unsatisfactory material, preparing areas to be filled, spreading and compacting of fill in the areas to be filled, and all other work necessary to complete the grading of the site. It shall be the Contractor's responsibility to place, spread, moisten or dry, and compact the fill in strict accordance with these specifications to the lines and grades indicated on project plans or as directed in writing by the Geotechnical Engineer. Included with this Work are the following:

1. General exterior grading, cutting and filling, including grading for building area, paving, planting areas, banks and hillsides.

2. Excavating, filling, backfilling, and compacting for Project site pavement, planting areas, buildings, and other structures.

3. Subgrade preparation for hardscape.

4. Excavating and backfilling trenches.

5. Shoring plan guidelines.

B. Related Sections: The following Sections contain requirements that relate to this Section.

1. Section 01 71 23 - Field Engineering.

2. Section 32 12 16 - Asphalt Paving.

3. Section 32 13 13 – Concrete Paving.

1.02 DEFINITIONS

A. Excavation consists of the removal of material encountered to subgrade elevations and the reuse or disposal of materials removed.

B. Subgrade: The uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.

C. Borrow: Soil material obtained off site when sufficient approved soil material is not available from excavations.

D. Base Course: The layer placed between the subgrade and surface pavement in a paving system.

E. Drainage Fill: Course of washed granular material supporting slab on grade placed to cut off upward capillary flow of pore water.

F. Permeable Backfill: Provide permeable backfill material behind retaining structures consisting of gravel, crushed gravel, crushed rock, natural sands, manufactured sand, or combinations.

G. Unauthorized excavation consists of removing materials beyond indicated subgrade elevations or dimensions without direction by the Architect. Unauthorized excavation, as well as remedial work directed by the Architect, shall be at the Contractor's expense.

H. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man made stationary features constructed above or below ground surface.

I. Utilities include underground pipes, conduits, ducts, and cables, as well as underground services within building lines.

1.03 SUBMITTALS TO CONSTRUCTION MANAGER

A. General: Submit the following according to the Conditions of the Contract and Division 1 Specification Sections.

B. Product data for the following:

1. Each type of plastic warning tape.

2. Filter fabric.

C. Samples of the following:

1. 12 by 12 inch sample of filter fabric.

D. Test Reports: In addition to test reports required under field quality control, submit the following:

1. One optimum moisture-maximum density curve for each soil sample.

2. Laboratory analysis of each soil material proposed for fill or backfill from borrow sources.

E. Excavation support & protection (shoring) shop drawings for informational purposes: Prepared by or under the supervision of a qualified professional engineer for excavation support and protection systems.

1.04 QUALITY ASSURANCE

A. Codes and Standards:

1. 2025 California Building Code, Title 24, Part 2, Volume 2 of 2, Appendix J, Grading.

2. ASTM D422 - Method for Particle Size Analysis of Soils

3. ASTM D1556 - Test Method for Density of Soil in Place by the Sand-Cone Method.

4. ASTM D1557 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10-lb (4.54 kg) and 18-inch (457-mm) Drop.

5. ASTM D2216 - Method for Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil Aggregate Mixtures.

6. ASTM D2922 - Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depths).

7. ASTM D3017 - Test Method for Moisture Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depths).

8. ASTM D4318 - Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils.

9. AASHTO T217 - Determination of Moisture in Soils by Means of a Calcium Carbide Gas Pressure Meter.

10. ASTM D4829 - Expansion Index Test.

B. Conditions/Specifications and Special Provisions, as well as the Standard Specifications for Public Works Construction ("GREENBOOK"), 2024 Edition, adopted by the Southern California Chapter, American Public Works Association; herein referred to as the "Standard Specifications".

C. Comply with all requirements of permit for export of soil from site. Permit is to be obtained and paid for by Contractor. Furnish copies of all permits and licenses required by the City of Lake Elsinore to Owner's representative.

D. Professional Observation: A soils engineer will be retained by the Owner for purposes of inspection, testing and approval of all work under this section. Perform work of this Section under inspection and approval of the soils engineer. Give soils engineer not less than 48 hours advance notice of readiness for inspection.

E. The soils engineer will have the authority over all filling, grading, and compaction operations, including interruption of work if deemed necessary due to improper work

F. Pre-Grading Conference: Conduct conference at Project site to comply with requirements of Division 1 Section "Project Meetings."

1. Before commencing earthwork operations, meet with representatives of the governing authorities, Owner, Architect, consultants, Geotechnical Engineer, independent testing agency, and other concerned entities. Review earthwork procedures and responsibilities including testing and inspection procedures and requirements. Notify participants at least 3 working days prior to convening conference. Record discussions and agreements and furnish a copy to each participant.

1.05 CONSTRUCTION MONITORING

A. All earthwork and foundation construction should be monitored by a qualified engineer/technician under the supervision of a Geotechnical Engineer, including;

1. Observation of all site preparations;

2. Observation of shoring installation, if needed:

3. Observation of all site excavations;

4. Test and approval of all import soil;

5. Observation of placement of all compacted fills and backfills;

6. Observation of all surface and subsurface drainage systems;

7. Observation of all foundation and pile excavations;

8. Observation of subgrade preparation for paved and building areas.

B. The Geotechnical Engineer of Record should be notified at least three (3) days in advance of the start of construction. A joint meeting between the Contractor and Geotechnical Engineer is recommended prior to the start of construction to discuss specific procedures and scheduling. The Geotechnical Engineer should be present to observe the soil conditions encountered during construction, to evaluate the applicability of the recommendations presented in the Soils Report to the soil conditions encountered, and to recommend appropriate changes in design or construction if conditions differ from those described herein. The Geotechnical Engineer of Record should inspect and approval all imported backfill material prior to its placement as backfill, approve the subgrade beneath all fills, fill placement and bottom of all foundation excavations before concrete or steel is placed.

C. The Geotechnical Engineer shall submit compaction reports to the Construction Manager and the Civil Engineer at the completion of the work, including test results and plot plans indicating the locations from which the tested samples of fill were taken. The Geotechnical Engineer shall keep the Construction Manager informed on the progress of the grading work.

1.06 IMPORT AND EXPORT OF EARTH MATERIALS

A. Fees: Pay as required by government authority having jurisdiction over the area.

B. Bonds: Post as required by government authority having jurisdiction over the area.

C. Hauling Routes and Restrictions: Comply with requirements of authorities having jurisdiction over the area.

1.07 DIG ALERT NOTIFICATION

A. Before any excavation in or near the public right-of-way, the Contractor must contact the Underground Service Alert of Southern California (Dig Alert) at 811 for information on buried utilities and pipelines.

B. Delineation of the proposed excavation site is mandatory. Mark the area to be excavated with water soluble or chalk based white paint on paved surfaces or with other suitable markings such as flags or stakes on unpaved areas.

C. Call at least Two (2) full working days prior to digging.

D. If the members (utility companies) have facilities within the work area, they will mark them prior to the start of your excavation and if not, they will let you know there is no conflict. A different color is used for each utility type (electricity is marked in red, gas in yellow, water in blue, sewer in green, telephone and cable TV in orange).

E. The Law requires you to hand expose to the point of no conflict 24" (inches) on either side of the underground facility, so you know its exact location before using power equipment.

F. If caught digging without a Dig Alert ticket you can be fined as much as $50,000 per California government code 4216.

1.08 SUBSURFACE CONDITIONS

A. Where investigations of subsurface conditions have been made by the Owner with respect to subsurface conditions, utilities, foundation, or other structural designs, and that information is shown in the Plans, it represents only a statement by the Owner as to the character of materials which have actually been encountered by the Owner's investigation. This information is only included for the convenience of Bidders.

B. Investigations of subsurface conditions are made for the purpose of design only. The Owner assumes no responsibility with respect to the sufficiency or accuracy of borings or of the log of test borings or other preliminary investigations or of the interpretation thereof. There is no guaranty, either expressed or implied, that the conditions indicated are representative of those existing throughout the Work, or any part of it, or that unanticipated conditions may not occur. When a log of test borings is included in the Plans, it is expressly understood and agreed that said log of test borings does not

constitute a part of the Contract. The log of test borings represents only an opinion of the Owner as to the character of the materials to be encountered, and is included in the Plans only for the convenience of the Bidders. Making information available to Bidders is not to be construed in any way as a waiver of the provisions of the first paragraph of this Section, and Bidders must satisfy themselves through their own investigations as to conditions to be encountered

1.09 GRADING

A. If the Contractor encounters any suspected cultural resource, or unique archaeological or paleontological resource, during the course of construction, the Contractor shall halt or divert work and notify the District Representative immediately. The District will evaluate the situation and if warranted, will consult with a qualified archeologist or paleontologist to determine further actions.

B. If human remains are encountered unexpectedly during construction excavation and grading activities, the State Health and Safety Code Section 7050.5 requires that no further disturbance shall occur until the County Coroner has made the necessary findings as to origin and disposition pursuant to PRC Section 5097.98, and the Contractor will notify the District Representative immediately. If the remains are determined to be of Native American descent, the coroner has 24 hours to notify the Native American Heritage Commission.

1.10 PROJECT CONDITIONS

A. Data: Maps, boring logs, geotechnical and foundation investigation reports, and like reference data, not included in Contract Documents but made available to Contractor by Architect or Owner are for information only, and the Architect and Owner assume no responsibility for any conclusions Contractor may draw from such information. Should questions or issues arise, contact Architect or Owner for clarification.

B. Contractor shall determine existing conditions under which the Contractor will operate in performing the Work.

C. Information on Drawings does not constitute a guarantee of accuracy or uniformity of soil conditions over the Project site.

D. Existing utilities: Locate existing underground utilities in all areas of work prior to excavation or commencement of work. If utilities are to remain in place provide adequate means of protection during earthwork operations.

1. Should uncharted, or incorrectly charted piping or other utilities be encountered during excavation, consult Utility Owner immediately for direction. Cooperate with Owner and Utility companies in keeping respective services and facilities in operation. Repair damaged utilities to the satisfaction of Utility Company.

2. Do not interrupt existing utilities serving facilities occupied or used by Owner, or others, except when permitted in writing by Owner's Representative, and then only after acceptable temporary services have been provided.

3. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies for shut off of services if lines are active.

E. Noise and Dust Abatement: Exercise all reasonable and necessary means to abate dust, dirt rising and undue noise. Perform necessary sprinkling and wetting of construction site to allay dust as required by applicable codes and ordinances.

F. Water for Grading: Contractor shall obtain and pay for all water required for his grading operation. This may include, but is not limited to, payment of deposits to utility for construction meter, and payment of all monthly service and water charges. Construction meter shall be in place throughout construction period unless alternative arrangements are made with the local water purveyor to provide construction water for all purposes. Contractor shall be aware of water moratoriums and restrictions, and shall immediately advise Owner of effects on construction schedules.

G. Existing Conditions: Prior to commencing work at site, verify agreement of existing conditions with indicated conditions. Notify Owner's Representative in writing of discrepancies found. Start of work without notification constitutes acceptance of conditions, without cause for extra compensation.

H. Field obstructions, grade differences or differences in dimensions may exist that might not have been considered or observed during design of this project. Contractor shall promptly notify the Engineer and the Owner in writing upon discovery of and before disturbing, any physical conditions differing from those represented by approved plans and specifications. In the event this notification is not performed, the Contractor shall assume full responsibility for necessary revisions.

PART 2 - PRODUCTS

2.01 SOIL MATERIALS

A. General: All soils materials to be used throughout the site shall be approved for use by the Geotechnical testing engineer. Provide approved borrow soil materials from off-site when sufficient approved soil materials are not available from excavations.

B. No earthwork analysis has been completed with respect to the volumes of soils to be excavated, placed, or imported in order to provide the finished grades shown on the plans. **The Contractor is solely responsible for verifying the earthwork quantities necessary to complete the project.**

C. Satisfactory Soil Materials:

1. Satisfactory Soil Materials: The on-site soils should provide adequate quality fill material provided they are free from significant organic matter and other deleterious materials, and are at acceptable moisture contents.

D. Borrow / Imported Fill Material: Soil excavated from site or imported conforming to requirements for fill material.

1. Imported soils should be equal to, or better than, the on-site soils in strength, expansion, compressibility, and soil chemistry characteristics. In general, imported material should be free of organic matter and deleterious substances, have 100% passing a 2-inch sieve and an Expansion Index less than 20. Imported soils can be evaluated prior to their use but will not be prequalified by the geotechnical consultant. Approval of import soils will be given only after the material is on the project, either in-place, or stockpiled in adequate quantity to complete the project.

E. Base Course Material For Use Under Asphalt Pavement: Crushed base material shall consist of materials that meet the provisions listed below.

1. Crushed Aggregate Base (CAB) per Section 200-2.2, 3/4" maximum of the Standard Specifications for Public Works Construction (Green Book).

2. Crushed aggregate base (CAB) shall consist of native rock without naturally occurring asbestos or recycled materials. The Contractor shall submit written documentation, which identifies the source, volume, and proposed transport date of the material for review and approval by the Owner's Construction Manager prior to importing the material. A statement on company letterhead from the source, stamped by either a California Professional Geologist or Engineer, which states that the subject materials are native rock, do not contain any recycled materials and that the source does not mine ultramafic materials, a source of natural occurring asbestos shall be included in the submittal to Owner's Construction Manager.

3. Crushed Miscellaneous Base (CMB) per Section 200-2.4, fine sieve, of the Standard Specifications for Public Works Construction (Green Book). Prior to import, submit written certification to OAR that crushed Miscellaneous Base (CMB) does not contain Polychlorinated biphenyls (PCB) above laboratory detection limits when tested in accordance with EPA Method 8082.

F. Bedding Material for Trenches:

1. Bedding sand shall be as defined by Standard Specifications, Section 200-1.5, and shall be free of expansive material and organic matter. Bedding material for utility lines outside the property lines shall be as required by the agency having jurisdiction. <u>On-site soils are not considered suitable for bedding or shading of utilities</u>.

2. Sand providing a sand equivalent of at least 30. All of the sand bedding shall be compacted to a minimum 90 percent of maximum density as indicated in the Contract Documents by mechanical means. Flooding and jetting shall not be permitted without prior written approval from the Geotechnical Engineer. Where sheeting or shoring is used densification of the bedding shall be accomplished after the sheeting or shoring has been removed from the bedding zone, unless the sheeting or shoring is to be cut off or left in place. Pipe bedding material shall be placed in horizontal layers not exceeding (8) eight inches.

3. The use of gravel is not acceptable unless approved by the civil engineer of record.

G. Backfill Material for Trenches:

1. The on-site soils have been determined to be suitable for being used for backfilling purposes in trenches. Utility trenches should be backfilled with granular materials and mechanically compacted. Fill materials should be compacted to a minimum relative compaction of 90 percent, unless indicated otherwise. The relative compaction should be determined by ASTM D1557.

2.02 ACCESSORIES

A. Detectable Warning Tape: Acid and alkali-resistant polyethylene film metallic warning tape manufactured for marking and identifying underground utilities, 6 inches wide and 4 mils thick minimum, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep.

1. Tape Colors: Provide tape colors to utilities as follows:

a. Red: Electric, Fire Water.

b. Yellow: Gas, oil, steam, and dangerous materials.

c. Orange: Telephone and other communications.

d. Blue: Water systems, with “Caution: Water Line Below.”

e. Green: Sewer systems, with “Caution: Sewer Line Below.”

f. Green: Storm systems, with “Caution; Storm Drain Line Below.”

2.03 EXCAVATION SUPPORT & PROTECTION – SHORING PLAN

A. The CONTRACTOR shall have at the Worksite, copies or suitable extracts of: Construction Safety Orders, Tunnel Safety Orders and General Industry Safety Orders issued by the State Division of Industrial Safety. The CONTRACTOR shall comply with provisions of these and all other applicable laws, ordinances, and regulations.

B. Before excavating any trench 5 feet or more in depth, the CONTRACTOR shall submit a detailed plan to the Owner showing the design of shoring, bracing, sloping, or other revisions to be made for the Workers' protection from the hazard of caving ground during the excavation of such trench. If the plan varies from the shoring system standards, the plan shall be prepared by a registered Civil Engineer. No excavation shall start until the DISTRICT has accepted the plan and the CONTRACTOR has obtained a permit from the State Division of Industrial Safety. A copy of the permit shall be submitted to the DISTRICT.

C. The INSPECTOR will provide a competent person trench/excavation certification form to the CONTRACTOR. It shall be completely filled out before any worker has access to trench or excavation and returned to the INSPECTOR before the end of the first working day. The CONTRACTOR shall certify by this form the name of the competent person administering the Work, the soil classification, and the type of excavation protective system provided and/or installed.

D. The CONTRACTOR shall completely fence all excavations to provided protection against anyone falling into the excavation and to the satisfaction of the INSPECTOR. The fencing shall be in place at all times except when workers are present and actual construction operations are in progress.

E. The fencing material shall be chain link fabric or welded wire fabric (6x6-W9xW9 minimum) and 6 feet high, constructed according to one of the following:

1. Tensioned fencing material and have top and bottom tension wires securely fastened to driven steel posts or other equally rigid elements at a maximum spacing of 12 feet; or

2. Untensioned fencing materials securely fastened to extended trench shoring elements at a maximum spacing of 8 feet and fastened to continuous top and bottom rails constructed of nominal 2 in x 4 in lumber or equally rigid material. Framed panels with suitable supporting elements fastened together to form a continuous fence may also be used.

F. Payment for performing all work necessary to provide safety measures shall be included in the prices bid for other items of work except where separate bid items for excavation safety are provided, or required by law.

PART 3 - EXECUTION

3.01 PREPARATION

A. Protect adjacent property and existing improvements and structures as necessary to prevent undermining, caving of cuts, and miscellaneous damage.

B. Provide cribbing, sheeting, and shoring necessary to safely retain the earth banks and protect excavations and adjoining grades from caving and other damage resulting from

excavating together with suitable forms of protection against bodily injury to personnel employed on the work and the general public. Be responsible for the design, installation, and maintenance of required cribbing and shoring and shall meet the approval of the State Division of Industrial Safety and local governing agencies requirements.

C. Utility lines and structures shown shall be protected and treated as indicated. Where work not shown is encountered, report it to the Architect before proceeding with excavation. Encase active lines in sleeves where they pass through concrete; remove inactive lines as directed, and plug the remaining ends. Bear the costs for repairs to damaged or broken utilities and any damages related thereto.

D. Protect existing improvements and adjacent properties from storm damage and flood hazard originating on this project until final acceptance by the Owner. Prevent silt run-off from the limits of work in accordance with governmental requirements.

E. A minimum 6-foot high, temporary chain link fence and gates, (pair 26' wide, minimum) shall be erected prior to any grading operations at the construction limits perimeter. Coordinate the exact location with Architect and Inspector.

3.02 DEWATERING

A. Prevent surface water and subsurface or ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area. Any water entering an excavation shall be immediately pumped out and the exposed excavation allowed to dry.

B. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.

3.03 GRADE STAKES

A. The Contractor's Surveyor will set grade stakes. The Surveyor shall be a California registered land surveyor or licensed Civil Engineer. The Surveyor shall be hired and paid by the Contractor, and shall be subject to the approval of the District. Contractor shall notify the District at least 48 hours before staking is to be started. The District will determine if work is ready for staking.

B. All work shall conform to the lines, elevations, and grades shown on the Construction Plans. Three consecutive points set on the same slope shall be used together so that any variation from a straight grade can be detected. Any such variation shall be reported to the Engineer. In the absence of such report, the Contractor shall be responsible for any error in the grade of the finished work.

C. Protect and maintain stakes in place until their removal is approved by the District. Grade or location stakes lost or disturbed by Contractor, shall be reset by the Surveyor at the expense of Contractor.

D. Grades for underground conduits will be set at the surface of the ground. The Contractor shall transfer them to the bottom of the trench.

3.04 EXCAVATION

A. Unclassified Excavations: Comply with the Standard Specifications for Public Works Construction, Section 300: "Earthwork", except as modified herein.

B. In preparation for grading, the construction areas should be cleared of surface vegetation, concrete, pavement and any loose surficial soils. Any unsuitable material encountered should be properly disposed of and not incorporated into any new fill.

C. Excavate to the depths, lines and grades indicated on the approved Grading Plan. Excavate sufficiently over-size to permit installation and removal of concrete forms and other required work. Should soil of inadequate density and bearing capability be encountered at the elevations indicated on the drawings, or where new fill is to be placed upon existing loose fill material exposed by excavation, the excavation shall be carried to the depth required to attain soil of bearing quality as determined by the Geotechnical Engineer.

D. A California Licensed Surveyor (LS) must provide grade stakes and elevations for the Geotechnical Engineer to verify that the over-excavation depths, shown on the construction drawings for asphalt concrete pavement and concrete pavement structural sections, have been achieved prior to re-compaction.

E. Should footing excavations exceed required dimensions or should sloughing occur, fill such extra space with concrete at no additional cost to the contract. If unsuitable material is found at the indicated depths, immediately notify the Inspector.

F. Notify the Inspector 48 hours before foundation excavations are ready for inspection.

G. The bottoms of footings shall be free of loose material, debris, and water before concrete is placed.

H. Cut banks shall be neatly trimmed to the required finish surface as the cut progresses, or the Contractor shall have the option of leaving the cuts full and finish grading by mechanical equipment which shall produce the finish surfaces as shown on the Drawings.

I. Surplus earth not needed for filling and grading shall be disposed of in a legal manner off the site.

J. All applicable requirements of the California Construction and General Industry Safety Orders, the Occupational Safety and Health Act of 1970, and the Construction Safety Act should also be followed.

K. Bills of lading or equivalent documentation will be submitted to the IOR on a daily basis.

L. Upon completion of import operations, provide the OAR a certification statement attesting that all imported material has been obtained from the identified source site.

3.05 EXCAVATION FOR HARDSCAPE

A. Refer to sheet C3.00, Asphalt Pavement & Concrete Pavement details, in the construction documents for subgrade preparation requirements under hardscape.

B. The subgrade preparation recommendations are based on the assumption that soils encountered during field exploration are representative of soils throughout the site. However, there can be unforeseen and unanticipated variations in soils between points of subsurface exploration. For this reason, the actual scarification and over-excavation depths will have to be determined on the basis of in-grading observations and testing performed by representatives of the Owner's geotechnical consultant.

C. Whenever batch trucks or other paving equipment cause rutting of the subgrade or subbase in asphalt or concrete placement areas, inspectors shall immediately stop construction. Construction shall not be allowed to resume until distorted subgrade or subbase is repaired. Contractors and inspectors should locate by proof rolling, any questionable unstable areas in advance to avoid distortion under equipment. Wet, unstable areas must be dried out or replaced before starting placement of asphalt. Locating wet or soft areas in advance can be accomplished by testing finished subgrade or subbase with a loaded truck. Construction of asphalt or concrete pavement should not proceed unless testing gives a reasonable indication that distortions will not occur during construction of overlying pavement. When repair, aeration, and recompaction are required to correct damage from Contractor's operation, all necessary repair will be done at Contractor's expense. However, if the Engineer determines that additional depth of aeration and recompaction are needed, that should be paid by change order.

D. A California Licensed Surveyor (LS) must provide grade stakes and elevations for the Geotechnical Engineer to verify that the over-excavation depths, shown on the construction drawings for asphalt concrete pavement structural sections, have been achieved prior to re-compaction.

E. Subgrade tolerances: Subgrade for pavement shall not vary more than 0.02' from the specified grade and cross section established by the Engineer. Subgrade for base material shall not vary more than 0.04' from the specified grade and cross section. Variations within the above specified tolerances shall be compensating so that the average grade and cross section specified are met.

3.06 EXCAVATION, BACKFILL & COMPACTION FOR UTILITIES

A. Field conditions may require deviations from information indicated on Drawings. Such changes in work shall be covered by a Change Order, indicating an increase or decrease in the Contract sum.

B. Before excavation, Contractor shall contact the "Underground Service Alert of Southern California" (USASC) for information on buried utilities and pipelines.

C. When connections are to be made to any existing pipe, conduit, or other appurtenances, the actual elevation or position of which cannot be determined without excavation, the Contractor shall excavate for, and expose, the existing improvement before laying any pipe or conduit. The Engineer shall be given the opportunity to inspect the existing pipe or conduit before connection is made. Any adjustments in line or grade which may be necessary to accomplish the intent of the plans will be made, and the Contractor will be paid for any additional work resulting from such change in line or grade.

D. Trenches, ditches, pits, sumps, and similar items which are outside the barricaded working area shall be barricaded to conform to Cal OSHA standards.

E. Trenches over 5'-0" in depth shall conform to the Construction Safety Orders of the California Division of Industrial Safety, see Section 2.3 EXCAVATION SUPPORT & PROTECTION – SHORING PLAN.

F. Safe and suitable ladders which project 2 feet above the top of the trench shall be provided for all trenches over 4 feet in depth. One ladder shall be provided for each 50 feet of open trench, or fraction thereof, and be so located that workers in the trench need not move more than 25 feet to a ladder.

G. Where indicated and/or required to excavate in lawn areas, protect adjoining lawn areas outside of the Work area. Replace or install removed sod upon completion of backfill by installing sod level with adjacent lawns. If installation of removed sod fails, furnish sod and install to match existing lawns.

H. Backfill over excavations to the required elevations with earth, gravel, sand, or concrete and compact as required. Provide excavations free from standing water by pumping, draining, or providing protection against water intrusion. Slope adjacent grades away from excavations to minimize entry of water.

I. Do not excavate trenches parallel to footings closer than 18" from the face of the footing or below a plane having a downward slope of 2 horizontal to one vertical, from a line 9" above bottom of footings.

J. If soft, spongy, unstable, or other unsuitable material is encountered upon which the bedding material or pipe is to be placed, this material shall be removed to a depth ordered by the Engineer and replaced with bedding material suitably densified. Additional bedding so ordered, over the amount required by the Plans or Specifications, will be paid for as provided in the Bid. If the necessity for such additional bedding material has been caused by an act of failure on the part of the Contractor or is required for control of groundwater, the Contractor shall bear the expense of the additional excavation and bedding.

K. Unless indicated otherwise on the plans are within this specification, excavate trenches to the required depths for utilities, such as pipes, conduit and tanks, with minimum allowances of 6 inches at the bottom and 6 inches at the sides for bedding of unprotected piping or as required for concrete encasement of conduits as indicated on Drawings. Maximum allowances at the sides for trenching shall be 12 inches. Grade bottom of trenches to a uniform smooth surface. Remove loose soil from the excavation before installing sand bedding or concrete encasement.

L. Where portions of existing structures, walks, paving, etc. must be removed or cut for pipe or conduit installation, replace the material with equal quality, finished to match adjacent work.

M. Provide a minimum clear dimension of 6 inches from sides of wall excavation to outer surfaces of buried pipes or conduits installed in the same trench or outside surfaces of containers and/or tanks.

N. DO NOT place backfill until the bedding and pipe work installed has been inspected, tested and approved by the Inspector. Remove excavated rocky material unsuitable for backfill from the site prior to final backfilling.

O. Bedding material immediately around a utility line and to a point 12 inches above the line should consist of sand, fine-grained gravel, or cement slurry to support the line and protect it.

P. Bedding zone shall be defined as the area containing the material specified that is supporting, surrounding, and extending to 12” (inches) above the top of pipe.

Q. Bedding material shall first be placed on a firm and unyielding subgrade so that the pipe is supported for the full length of the barrel. There shall be 6” (inch) minimum of bedding below the pipe barrel and 1” (inch) clearance below a projecting bell for sewer, storm drain and water pipe. The material in the bedding zone shall be placed and densified by mechanical compaction only.

R. Mechanically compacted backfill shall comply with section 306-1.3.2 of the Standard Specifications for Public Works Construction.

S. Concrete backfill trenches that carry below or pass under footings and that are excavated within 18 inches of footings. Place concrete to level of bottom of footings.

T. Fill voids with approved backfill materials as shoring bracing and sheeting is removed.

3.07 INSPECTION & TESTING AT TRENCHES

A. Pipe will be inspected in the field before and after laying. If any cause for rejection is discovered in a pipe after it has been laid, it shall be subject to rejection. Any corrective work shall be approved by the Engineer and shall be at NO cost to the Owner.

B. The Inspector or Geotechnical Engineer will inspect all subgrades and excavations prior to placing bedding & backfill materials.

C. DO NOT place backfill until the bedding and pipe work installed has been inspected, tested and approved by the Inspector. Remove excavated rocky material unsuitable for backfill from the site prior to final backfilling.

D. Utility backfill compaction test shall be performed in accordance with ASTM D1557, method "C".

E. Utility backfill in place density test per ASTM D 1556 (sand cone) or other test method as considered appropriate by the Geotechnical Engineer.

F. Hydrostatic pressure tests shall be done only after backfill has been placed and final compaction has been achieved.

3.08 APPROVAL OF SUBGRADE

A. Notify Geotechnical Engineer when excavations have reached required over-excavation subgrade.

B. When Geotechnical Engineer determines that unforeseen unsatisfactory soil is present, continue work only after receiving direction from the Contracting Officer.

C. Reconstruct subgrades damaged by rain, accumulated water or construction activities as directed by the Soils Engineer.

3.09 UNAUTHORIZED EXCAVATION

A. Fill of unauthorized excavation below bottoms of foundations or wall footings will be engineered fill.

B. Fill unauthorized excavations under other construction as directed by the Soils Engineer.

C. Where indicated widths of utility trenches are exceeded, provide stronger pipe, or special installation procedures, as required by the Geotechnical Engineer.

3.10 STORAGE OF SOIL MATERIALS

A. After the site has been stripped of all debris, vegetation and organic materials, excavated on site soils may be reused as engineered fill provided they meet the satisfactory soils material conditions in Section 2.01, part C. High in-site moisture contents will require aeration prior to placement as engineered fill.

B. Stockpile excavated materials acceptable for backfill and fill soil materials, including acceptable borrow materials. Stockpile soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees. Cover to prevent wind-blown dust.

3.11 PLACEMENT OF ENGINEERED FILL

A. Spreading and Compacting Fill Material:

1. Fill soils placed should be compacted in horizontal lifts to a relative compaction of 90 percent or more as evaluated by ASTM D 1557. The lift thickness for fill soils will vary depending on the type of compaction equipment used but should generally be placed in horizontal lifts not exceeding 8 inches in loose thickness. Fill soils should be placed at slightly above the optimum moisture content as evaluated by ASTM D 1557. Special care should be taken to avoid damage to utility lines and foundations when compacting fill and subgrade materials.

B. Compaction Testing:

1. The Geotechnical Engineer's representative shall observe the excavation, filling, and compacting operations and shall make density tests in the fill material so that he can state his opinion as to whether or not the fill was constructed in accordance with the specifications. If the surface is disturbed, the density tests shall be made in the compacted materials below the disturbed zone. When these tests indicate that the density or moisture content of any layer of fill or portion thereof does not meet the specified density or moisture content, the particular layer or portions shall be reworked until the specified density and moisture content have been obtained.

2. Sampling and testing of materials for determination of compliance with the specified compaction requirements will be conducted by the Geotechnical Engineer's representative at any location and time as the Owner may determine.

3. The Contractor shall be responsible for excavation of the test pits and for providing and installing any shoring, ladders, or other equipment necessary to protect the testing personnel. The Contractor shall also suspend operations as necessary and at no cost to the owner for the purpose of conducting such testing.

4. Test pits shall be excavated in the backfill by the Contractor as directed by the Engineer for the purpose of testing the backfill compaction. At the option of Engineer, density tests may be taken on a lift of compacted backfill immediately before placing the next lift.

5. Any settlement noted in backfill, fill, or in structures built over the backfill or fill within the one-year warranty period will be considered to be caused by improper compaction methods and shall be corrected at the Contractor's expense. Structures damaged by settlement shall be restored to their original condition by the Contractor at the Contractor's expense.

6. When initial compaction testing performed by the Engineer indicates the required density has not been obtained, the Contractor shall re-compact or replace the backfill as necessary to meet the specified minimum density.

7. The Contractor shall be responsible for rescheduling compaction testing with the Engineer and shall bear all costs for subsequent retesting in the areas of noncompliance. Costs associated with retesting and scheduling delays shall be the sole responsibility of the Contractor. The Engineer will deduct the costs for testing of materials and work found to be unacceptable, as determined by the tests performed by the Owner and the costs for testing of material sources identified by the Contractor which are not used for the work, from moneys due or to become due to the Contractor. The amount deducted will be determined by the Engineer.

3.12 BACKFILL - GENERAL

A. Backfill excavations promptly, but not before completing the following:

1. Acceptance of construction below finish grade including, where applicable, dampproofing, waterproofing, and perimeter insulation.

2. Surveying locations of underground utilities for record documents.

3. Testing, inspecting, and approval of underground utilities.

4. Concrete formwork removal.

5. Removal of trash and debris from excavation.

6. Removal of temporary shoring and bracing, and sheeting.

7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

3.13 GRADING

A. Rough & Fine Grading: Rough grade area sufficiently high to require cutting by fine grading.

B. General: Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

1. Provide a smooth transition between existing adjacent grades and new grades.
2. Cut out soft spots, fill low spots, and trim high spots to conform to required surface tolerances.
3. Grade area for paving to a depth below finish grades indicated, equal to base and pavement thickness to be constructed.

4. Cut banks neatly to required finish grades as cut progresses, or leave cuts full and finish grading by mechanical equipment, which will produce finish grades indicated on Drawings.
5. Grade filled banks full and compact beyond grade of finish bank so that when trimmed to finish grades, soil is compacted to density specified for final slope face.
6. Bring areas to be graded to approximate finish grades and then scarify, moisten and roll to obtain required density. Scarify, moisten and roll resulting high and low areas to obtain required finish grades by cutting and filling.
7. Grade future planting areas so that, upon cultivation and fertilization, they will conform to finish grades indicated for planting areas.
8. Protect all utilities.

C. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:

1. Building pad tolerance plus or minus ½ inch (0.05-foot).
2. Lawn or Unpaved Areas: Plus or minus (0.10-foot).
3. Walks: Plus or minus (0.04-foot).
4. Pavements: Plus or minus (0.04-foot).

D. Grading Inside Building Lines: Finish subgrade to a tolerance of ½ inch when tested with a 10-foot straightedge.

3.14 FIELD QUALITY CONTROL

A. The CONTRACTOR shall provide an independent approved California Department of Health Services certified testing laboratory, to perform sampling and testing of import/export fill materials in accordance with the terms as specified in Section 01 31 32: Import Materials Testing.

B. A Geotechnical Engineer, designated by the Owner, will be engaged to perform continuous inspection of the placing and compacting of all fills and backfills within the limits of grading of this project. All work shall be done in accordance with the approved plans and these specifications and as recommended and approved by the Geotechnical Engineer. Revised recommendations relating to conditions differing from the approved soils engineering and engineering geology reports shall be submitted to the owner, inspector, architect and the civil engineer. Costs for all such inspections and tests shall be paid by the Owner. The Contractor shall be responsible for notifying the Geotechnical Engineer in advance so that he may be present to perform his services as needed.

C. The Geotechnical Engineer shall submit compaction reports to the Construction Manager and the Architect at the completion of the work, including test results and plot plans indicating the locations from which the tested samples of fill were taken. The

Geotechnical Engineer shall keep the Construction Manager informed on the progress of the grading work.

D. Testing Agency Services: Allow testing agency to inspect and test each subgrade and each fill or backfill layer. Do not proceed until test results for previously completed work verify compliance with requirements.

1. Perform field in-place density tests according to ASTM D 1556 (sand cone method) or other test method as considered appropriate by Geotechnical Engineer.

a. Field in place density tests may also be performed by the nuclear method according to ASTM D 2922, provided that calibration curves are periodically checked and adjusted to correlate to tests performed using ASTM D 1556. With each density calibration check, check the calibration curves furnished with the moisture gages according to ASTM D 3017.

b. When field in place density tests are performed using nuclear methods, make calibration checks of both density and moisture gages at beginning of work, on each different type of material encountered, and at intervals as directed by the Architect.

2. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, perform at least one field in-place density test for every 2,000 sq. ft. or less of paved area or building slab, but in no case fewer than three tests.

3. Foundation Wall Backfill: In each compacted backfill layer, perform at least one field in place density test for each 100 feet or less of wall length, but no fewer than two tests along a wall face.

4. Trench Backfill: In each compacted initial and final backfill layer, perform at least one field in place density test for each 150 feet or less of trench, but no fewer than two tests.

E. When testing agency reports that subgrades, fills, or backfills are below specified density, scarify and moisten or aerate, or remove and replace soil to the depth required, recompact and retest until required density is obtained.

F. Owner's inspector will inspect foundation excavations when completed and ready for forms, after forms are in place, and before first placement of concrete.

3.15 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and re establish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or lose compaction due to subsequent construction operations or weather conditions.

1. Scarify or remove and replace material to depth directed by the Architect; reshape and recompact at optimum moisture content to the required density.

C. Settling: Where settling occurs during the Project correction period, remove finished surfacing, backfill with additional approved material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.

3.16 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off the Owner's property.

END OF SECTION

SECTION 31 63 29
DRILLED CONCRETE PIERS AND SHAFTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Machine drilled shaft.

B. Concrete materials and mix.

1.02 RELATED REQUIREMENTS

A. Section 03 20 00 - Concrete Reinforcing: Requirements for concrete reinforcement.

B. Section 03 30 00 - Cast-in-Place Concrete: Requirements for concrete.

C. Section 13 31 00 - Fabric Structures: Drilled footing requirements.

1.03 DEFINITIONS

A. Pier Diameter: Diameter of drilling bucket or auger bit or inside diameter of casing.

B. Pier Length: Total length of caisson from bottom of wall, grade beam or pier cap to bottom of hole as drilled.

C. Center of Piers: Intersection of two diameters, one taken parallel to the wall, grade beam, or column line direction, the other taken perpendicular to the first diameter.

D. The term caissons, piles and piers mentioned in reference to this project within the body of these documents shall always mean “drilled concrete piers and shafts”

1.04 REFERENCE STANDARDS

A. ACI SPEC-336.1 - Construction of Drilled Piers - Specification.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by all affected installers.

1.06 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Project Record Documents: Record actual locations of piers, pier diameter, and pier length. Accurately record the following:

1. Sizes, lengths, and locations of piers.
2. Sequence of placement.
3. Final base and top elevations.
4. Deviation from indicated locations.
5. Placement and configuration of reinforcement deviations.

1.07 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing the work of this section with minimum 3 years of documented experience.

PART 2 PRODUCTS

2.01 MATERIALS

A. Tubular Column Type: Round, spirally wound laminated fiber material, surface treated with release agent, non-reusable, of sizes indicated. Provide Sonotube Plus Fiber Forms manufactured by Sonoco Products Co., Hartsville, SC (803)383-7000. Provide wall thickness sufficient to maintain finished concrete surface true within 1/8-inch in 10 feet.]

B. Concrete Materials and Mix: Specified in Section 03 30 00.

C. Reinforcement: Specified in Section 03 20 00 - Concrete Reinforcing, 03 30 00 - Cast-in-Place Concrete, and 32 13 13 - Concrete Paving; spiral wound.

D. Equipment: Appropriate for dewatering excavated shaft.

PART 3 EXECUTION

3.01 PREPARATION

A. Use placement method which will not cause damage to nearby structures.

B. Notify adjacent and affected land owners and building occupants with 90 days notice before proceeding with the work.

C. Prepare to place piers from existing site elevations.

D. Grade perimeter of pier and shaft area to prevent surface water from draining into soil borings. Provide temporary means and methods, as required, to maintain surface diversion until no longer needed, or as directed by the Architect.

3.02 INSTALLATION

A. Construct piers in accordance with ACI SPEC-336.1.

B. Drill vertical pier shafts to diameters and depths indicated.

C. Clean shaft and bottom of loose material. Provide temporary means and methods, as required, to remove all water from soil borings as needed, or until directed by the Geotechnical Engineer.

D. Allow inspection of shaft prior to placement of reinforcement and concrete.

E. Place reinforcing steel in accordance with Section .03 20 00 - Concrete Reinforcing, 03 30 00 - Cast-in-Place Concrete, and 32 13 13 - Concrete Paving

F. Place concrete in single pour, in accordance with Section 03 30 00 with equipment designed for vertical placement of concrete.

G. Coordinate casing withdrawal with concrete placement so that concrete pressure head exceeds anticipated outside soil and water pressure above bottom of casing at all times during withdrawal.

H. Extend reinforcement for connection of caps.

I. Set tops of piers to elevations indicated.

3.03 TOLERANCES

A. Install piers with maximum variation from location, plumbness, bottom area, diameter, and anchorage locations as specified in ACI SPEC-336.1.

B. Maximum Variation From Vertical: 1 in 48.

C. Maximum Variation From Design Top Elevation: Plus 3 inches, minus 1 inch.

D. Maximum Out-of-Position: 2 inches.

3.04 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed under provisions of Section 01 40 00 - Quality Requirements.

3.05 UNACCEPTABLE PIERS

A. Unacceptable Piers: Piers placed out of position, are below elevations, or are damaged.

B. Provide additional piers or replace piers failing to comply with specified requirements.

END OF SECTION

SECTION 32 11 20
SUBBASE AND AGGREGATE BASE COURSES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Subbase course.

B. Aggregate base course.

1.02 RELATED REQUIREMENTS

A. Section 31 20 00 - Earthwork.

1.03 REFERENCE STANDARDS

A. AASHTO T 180 - Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.

B. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)).

C. ASTM D1556/D1556M - Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method.

D. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).

E. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.

F. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).

G. ASTM D3665 - Standard Practice for Random Sampling of Construction Materials.

H. ASTM D6938 - Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Test Reports:

1. Aggregate Composition: Results of laboratory tests on proposed and actual materials used.
2. Compaction Density: Results of laboratory tests on compacted course.

C. Manufacturer's Instructions: Indicate geosynthetic installation procedure.

D. Source Quality Control Submittals: Submit name of imported materials source.

E. Field Quality Control Submittals: Submit compaction density testing results.

F. Testing agency's qualification statement.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing work of the type specified and with minimum three years of documented experience.

B. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of type specified in this section.

C. Documents at Project Site: Maintain at project site one copy of manufacturer's instructions.

1.06 DELIVERY, STORAGE, AND HANDLING

A. See Section 01 74 19 - Construction Waste Management and Disposal for packaging waste requirements.

B. Deliver geosynthetic to project site wrapped in protective covering, maintain prior to use.

C. Aggregate Storage: Prevent material intermixing, contamination, and deterioration.

PART 2 PRODUCTS

2.01 MATERIALS

A. Subbase Course:

1. Graded in accordance with ASTM D2487 Group Symbol SW.

B. Aggregate Base Course:

1. Type Class II : Comply with State of California Highway Department standard.
    a. CalTrans Standard Specifications 26-102.
2. Graded according to ASTM D2487 Group Symbol GW.

2.02 SOURCE QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements for additional requirements.

B. If tests indicate materials do not meet specified requirements, change material and retest.

C. Provide materials of each type from same source throughout the Work.

D. For aggregate materials using classification complying with ASTM D2487, provide testing before delivery to site.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that survey bench marks and intended elevations for the work are as indicated.

B. Verify substrate has been inspected, and gradients and elevations are correct and dry.

3.02 PREPARATION

A. Correct irregularities in substrate gradient and elevation by scarifying, reshaping, and recompacting.

B. Do not place aggregate on soft, muddy, or frozen surfaces.

C. Grade excavated and filled substrate; see Section 31 20 00.

1. Grade the sub-grade to an elevation 8 inches lower than the finish grades indicated on the Drawings.

a. After the pathways are graded to the required elevations, compact and/or roll as required by Section 31 20 00 - Earthwork.

b. Drag or float the sub-grade or floated to provide a uniform surface, free from any irregularities.

3.03 PLACEMENT

A. Under Aggregate Surfacing:

1. Subbase Compacted Thickness: According to design drawings.

2. Install geosynthetic reinforcement on substrate in accordance with manufacturers instructions.

3. Aggregate Base Compacted Thickness: 4 inches (100 mm).

4. Compact to 95 percent of maximum dry density.

B. Place course in maximum 4 inch layers and roller compact to specified density.

C. Level and contour surfaces to elevations and gradients indicated.

D. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

3.04 TOLERANCES

A. Variation From Design Elevation: Within 1/2 inch.

B. Flatness: Maximum variation of 1/2 inch measured with 10 foot straight edge.

C. Scheduled Compacted Thickness: Within 1/2 inch.

3.05 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements for additional requirements.

B. Subbase Compaction Density Testing: In accordance with ASTM D1556/D1556M, ASTM D2167, or ASTM D6938.

C. Aggregate Base Compaction Density Testing: In accordance with ASTM D1556/D1556M, ASTM D2167, or ASTM D6938.

D. Evaluate results in relation to compaction curve determined by testing uncompacted material in accordance with AASHTO T 180, ASTM D698 ("standard Proctor"), or ASTM D1557 ("modified Proctor").

E. Frequency of Tests: In accordance with ASTM D3665.

F. Remove, replace, and retest work that does not meet specified requirements.

G. Proof roll compacted aggregate at surfaces going underneath natural surfacing (decomposed granite).

3.06 CLEANING

A. See Section 01 70 00 - Execution and Closeout Requirements for additional requirements.

B. Stockpile unused materials neat and compact.

END OF SECTION

SECTION 32 12 16
ASPHALT PAVING

PART 1 - GENERAL

1.1 REQUIREMENT

A. The Contractor shall furnish all tools, equipment, materials, and supplies and shall perform all labor required to complete the work as indicated in the Contract Documents and specified herein.

B. The following types of pavement shall be covered in this Section:
   1. Paving for utility trenching, parking lots, playgrounds, areas between buildings, adjacent to planting and turf areas, and as indicated on Construction Documents.

C. Related Sections:
   1. Section 31 20 00: Earthwork.
   2. Section 32 12 36: Seal Coats.

1.2 QUALITY ASSURANCE

A. The work provided herein shall conform to and be in accordance with the Contract Plans, General Conditions/Specifications and Special Provisions, as well as the Standard Specifications for Public Works Construction ("GREENBOOK"), 2024 Edition, adopted by the Southern California Chapter, American Public Works Association; herein referred to as the "Standard Specifications".

B. The Owner's inspector shall test the temperature of each batch of asphaltic concrete prior to placement. At the time of delivery to the work site, the temperature of mixture shall not be lower than 260 degrees F or higher than 320 degrees F, the lower limit to be approached in warm weather and the higher in cold weather. If asphaltic concrete temperature is not within these tolerances the affected batch shall be rejected. Any and all costs due to the rejected asphaltic concrete shall be the responsibility of the paving contractor.

1.3 ESTABLISHMENT OF GRADES

A. The Contractor's Surveyor will set grade stakes. The Surveyor shall be a California registered land surveyor or licensed Civil Engineer. The Surveyor shall be hired and paid by the Contractor, and shall be subject to the approval of the Owner. Contractor shall notify the Owner at least 48 hours before staking is to be started. The Owner will determine if work is ready for staking.

B. All work shall conform to the lines, elevations, and grades shown on the Construction Plans. Three consecutive points set on the same slope shall be used together so that any variation from a straight grade can be detected. Any such variation shall be reported to the Engineer.

In the absence of such report, the Contractor shall be responsible for any error in the grade of the finished work.

C. Protect and maintain stakes in place until their removal is approved by the Owner. Grade or location stakes lost or disturbed by Contractor, shall be reset by the Surveyor at the expense of Contractor.

D. Areas having drainage gradients of 2 percent or more shall have elevation stakes, set with instrument, at grid intervals of 25 feet. Intermediate stakes may be set by using a tightly-drawn string line over the tops of adjacent stakes. Grade stakes must be set at all grade breaks, grade changes, etc.

E. Areas having drainage gradients of less than 2 percent shall have elevation stakes, set with instrument, at 10 foot intervals. Grade stakes must be set at all grade breaks, grade changes, etc.

1.4 SUBMITTALS

A. Mix Designs: The CONTRACTOR shall formulate a job-mix formula using the Hveem method in accordance with Standard Specifications Section 203-6.2 and submit it to the ENGINEER for approval. The resultant mixture shall have Hveem properties conforming to Standard Specifications Section 203-6.4.3.

B. Samples:

1. Prior to the delivery of specified aggregate to the site, the CONTRACTOR shall submit samples of the material for the INSPECTOR's acceptance in accordance with Standard Specifications Section 4-1.4. Samples shall be typical of materials to be furnished from the proposed source and in conformance with the specified requirements.

2. Aggregate base gradation and quality certifications shall be dated within 30 days of the submittal.

C. Certificates

1. Twenty days prior to the delivery of aggregates, asphalt materials, and paving mixes to the project site, the Contractor shall submit to the Engineer certificates and test results of compliance of such materials with these specifications.
2. Submit certificates of compliance from the supplier for bituminous materials for paint binder, asphaltic concrete, and seal coat.
3. Submit weigh master's certificates or certified delivery tickets for each truck load of asphaltic material delivered to the project site.
4. Upon completion of the weed control treatment, and as a condition for final acceptance, furnish a written certificate stating the brand name of the sterilant and the manufacturer, and that the sterilant used had at least the minimum required

concentration, and that the rate and method of application complied in every respect with the conditions and standards contained herein.

1.5 QUALITY CONTROL

A. Asphaltic Concrete Producers Qualifications: Use only materials furnished by a bulk asphaltic concrete producer regularly engaged in production of hot mix, hot laid bituminous concrete.

B. Applicator Qualifications: Paving machine and roller operators shall be fully trained and experienced in the installation of asphaltic concrete paving on projects of similar size and complexity.

C. Regulatory Requirements: The quantity of volatile organic compounds (V.O.C.) used in weed killer, seal coat, primer and other materials shall not exceed the limits permitted under the current regulations of the local authorities having jurisdiction.

1.6 ENVIRONMENTAL LIMITATIONS

A. Do not apply asphalt materials if substrate is wet or excessively damp or if the following conditions are not met:

1. Tack Coats: Minimum surface temperature of 60 deg F.
2. Asphalt Base Course: Minimum surface temperature of 40 deg F and rising at time of placement.
3. Asphalt Surface Course: Minimum surface temperature of 60 deg F at time of placement.

1.7 PAVEMENT-MARKING PAINT

A. Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40 deg F for oil-based materials, 50 deg F for water-based materials, and not exceeding 95 deg F.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Base Course Material: Crushed aggregate base material shall consist of materials that meet the provisions of Specifications Section 31 20 00 Earthwork, Part 2.01F.

B. Asphalt Surfacing Materials: Furnish asphalt surfacing meeting the following requirement, furnished from a commercial asphalt central mixing plant.

1. Paint Binder/Tack Coat: Asphalt emulsion shall be CSS-1 or CSS-1h and shall conform to the requirements of Standard Specifications Section 203-3 Emulsified Asphalt.
2. Asphalt Concrete Composition & Grading:

a. Asphalt concrete in all areas shall conform to Standard Specification Section 203-6.5.4, Type III-C3-PG-64-10.
b. Asphalt performance grade shall be PG-64-10.
c. Rubberized asphalt paving is not allowed.

C. Weed Control:

1. The soils sterilant shall be in accordance with current EPA acceptable standard and the California Department of Pesticide Regulations for soils sterilant. Sterilant shall be selected as appropriate for the environment in which is it to be placed. Contractor shall be licensed with the State of California to apply sterilant. Sterilant shall be commercial grade for commercial application. Payment for soil sterilization will include full compensation for application and all materials and incidental work required.

2. Apply Dow Elanco Spike 80DF, or approved equal, to top of crushed aggregate base under all asphalt paving at locations shown on civil plans. Spike 80DF weed control should be applied at the rate of seven pounds per acre. If another manufacturer is used follow their recommendations.

D. Headers and Stakes:

1. Headers: Redwood, Construction Heart Grade, size 2 x 6, unless otherwise indicated on construction drawings
2. Stakes: 2 x 4 redwood or 2 x 3 Douglas fir, Construction Grade.
3. Nails: Common, galvanized, 12d minimum.

PART 3 - EXECUTION

3.1 HEADERS

A. Install headers along edge of bituminous surfacing abutting turf, earth, or planting area, unless indicated otherwise.

B. Install headers so the bottom surface has continuous bearing on solid grade. Where excavation for headers is undercut, thoroughly tamp soil under the header. Compact backfill on both sides of header to the density of adjacent undisturbed earth.

C. Fasten headers in place with redwood or Douglas fir stakes of length necessary to extend into solid grade a minimum of 12 inches. Stakes shall be of sound material, neatly pointed, driven vertically, and securely nailed to headers. Space stakes, not to exceed 4 feet on centers with top of stakes set one inch below top of header. Provide a minimum of 2-12d galvanized common nails through each stake.

D. Remove existing headers where new surfacing is installed adjacent to existing surfacing.

E. Install temporary headers at transverse joints of paving where continuous paving operations are not maintained.

F. Provide additional stakes and anchorage as required to fasten headers in place

3.2 SUBGRADE PREPARATION

A. Subgrade Preparation:
   1. Refer to asphalt pavement detail 2 on sheet C3.00 for requirements.

B. The subgrade preparation recommendations on C3.00 are based on the assumption that soils encountered during field exploration are representative of soils throughout the site. However, there can be unforeseen and unanticipated variations in soils between points of subsurface exploration. For this reason, the actual subgrade preparation will have to be determined on the basis of in-grading observations and testing performed by representatives of the project geotechnical consultant.

C. A California Licensed Surveyor (LS) must provide grade stakes and elevations for the Geotechnical Engineer to verify that the over-excavation depths, shown on the construction drawings for asphalt concrete pavement structural sections, have been achieved prior to re-compaction.

D. Subgrade tolerances: Subgrade for pavement shall not vary more than 0.02' from the specified grade and cross section established by the Engineer. Subgrade for subbase or base material shall not vary more than 0.04' from the specified grade and cross section. Variations within the above specified tolerances shall be compensating so that the average grade and cross section specified are met.

E. Correct irregularities by dressing down or filling as may be required, to bring areas to true subgrade elevations.

F. Where filling is required, scarify the subgrade to bond the new material to the in place material; use additional material as required, subject to the approval of the Architect, and provided by the Contractor.

G. Remove excess material from the site to a legal disposal area.

3.3 APPLICATION GENERAL

A. Finish elevations, extent of asphalt paving and locations of type of asphalt and class of base shall be as indicated and specified herein and on the Construction Documents. Bring subgrade elevations sufficiently below the finish elevations of the paving so as to accommodate the thickness of paving and base.

3.4 APPLICATION OF BASE COURSE

A. Install base course material, encompassing spreading and compacting, in accordance with the S.S.P.W.C. Section 301-2, Untreated Base.

B. Aggregate bases material shall be installed in layers not exceeding 4-inches and compacted to a minimum of 95% relative density.

C. After preparing the subgrade all traffic on the subgrade shall be avoided. Should it be necessary to haul over the prepared subgrade, the CONTRACTOR shall drag and roll the traveled way as frequently as may be necessary to remove ruts, cuts, and breaks in the surface. All cuts, ruts, and breaks in the surface of the subgrade that are not removed by the above operations shall be raked and hand tamped. All equipment used for transporting materials over the prepared subgrade shall be equipped with pneumatic tires.

D. Continued use of sections of prepared subgrade for hauling, so as to cut up or deform it from the true cross-section, will not be permitted. The CONTRACTOR shall protect the prepared subgrade from all traffic.

E. Maintain the surface in its finished condition until the succeeding layer is placed.

3.5 PLACING ASPHALT CONCRETE SURFACING:

A. Asphalt binder (tack coat) shall be applied to all existing pavement surfaces to be overlaid and/or joined per section 302-5.4 of the Standard Specifications. Asphalt binder (tack coat) shall be applied to existing surfaces to be surfaced and between layers of asphalt concrete, except when eliminated by the Engineer. A layer of asphalt binder (tack coat) shall be applied to all vertical-cut faces and between subsequent AC lifts.

B. Asphalt Concrete Pavement:

1. All work shall be in accordance with Section 302-5 of the Standard Specifications, except as noted herein. Asphalt concrete work shall include full-depth patching and variable thick asphalt concrete transition areas. The Contractor shall, on a daily basis, provide the Inspector with copies of certificates of weight for all materials delivered to the job site and/or incorporated in the work. At no time shall the coarse aggregate that has segregated from the mix be scattered across the paved mat.
2. Asphalt concrete shall not be placed on any surface, which contains ponded water or excessive moisture in the opinion of the Engineer. If paving operations are in progress and rain or fog forces a shut down, loaded trucks in transit shall return to the plant, and no compensation will be allowed therefore. The Contractor shall furnish and use canvas tarpaulins to cover all loads of asphalt from the time that the mixture is loaded until it is discharged from the delivery vehicle, unless otherwise directed in writing by the Engineer
3. The Inspector will examine the base before the paving has begun. The Contractor will correct any deficiencies before the paving is started.

4. Successive courses may be laid upon previously laid courses as soon as the previous course has cooled sufficiently to show no perceivable displacement under equipment or loaded material delivery trucks and a tack coat has been applied.
5. Wherever AC pavement does not terminate against a curb, gutter, or another pavement, the Contractor shall provide and install a redwood or pressure treated Douglas fir header at the line of termination.
6. Smoothness of asphalt shall conform to section 302-5.6.2 of the Standard Specifications
7. Density shall conform to the below requirements:
    a. In-place density of the Asphalt Concrete will be based on test results from a nuclear gauge and core samples taken in accordance with CTM 375, "Determining the in Place Density and Relative Compaction of Asphalt Concrete Pavement" except as modified below. The Inspector will determine when core sample testing shall be completed.
    b. Asphalt Concrete shall be compacted to not less than 95.0 percent for a single test and not less than an average in place density of 96.0 percent relative compaction of the Laboratory Test Maximum Density as determined by, Caltrans Testing Method (CTM) 375 except as modified by these specifications.
    c. The materials testing laboratory, paid for by the contractor, will obtain random samples of the hot mix asphalt material from behind the paving machine in accordance with Caltrans Testing Method (CTM) 125, "Methods for Sampling Highway Materials and Products in Roadway Structural Sections", to determine the Laboratory Test Maximum Density of the asphalt mixture in accordance with CTM 308.
    d. Asphalt Concrete compaction shall be accepted based upon passing tests taken from the nuclear gauge. In the event that the nuclear gauge testing presents failing results, then core samples will be the determination for the in place density and acceptance or rejection of the compaction.
    e. When core testing is to be performed to determine the relative compaction after nuclear gauge testing has not produced passing tests, the materials testing laboratory will obtain four 4" diameter core specimens (or four 6" diameter core specimens) for determination of relative density of the completed pavement. The four cores shall represent the sample frequency requirements specified in CTM 375.
8. Pavement at all longitudinal joints shall have a Field Density of 95%, as described in 302-5.6.2 of the Standard Specifications. When the test results of the field cores are less than 95% Relative Compaction, the Contractor shall remove a 1 foot wide section on each side of the longitudinal joint. The Contractor shall replace the removed pavement with an asphalt mix that meets the job specification at no additional cost to the Owner.

3.6 FLOOD TESTING

A. Flood Test: BEFORE ACCEPTANCE, ALL NEW ASPHALT PAVEMENT SHALL BE WATER TESTED TO ENSURE PROPER DRAINAGE AS DIRECTED BY THE INSPECTOR. THE CONTRACTOR SHALL PROVIDE WATER FOR THIS PURPOSE. THE FLOODING SHALL BE DONE BY WATER TANK TRUCK. DEPRESSIONS WHERE THE WATER PONDS TO A DEPTH OF MORE THAN 0.01 FOOT

SHALL BE FILLED OR THE SLOPE CORRECTED TO PROVIDE PROPER DRAINAGE. THE EDGES OF THE FILL SHALL BE FEATHERED AND SMOOTHED SO THAT THE JOINT BETWEEN THE FILL AND THE ORIGINAL SURFACE IS INVISIBLE. PRACTICAL FIELD MEASUREMENT: 0.01 FOOT = TWO QUARTERS STACKED. NO STANDING WATER SHALL REMAIN AFTER 60 MINUTES ON A 70 DEGREE F (OR WARMER) DAY.

3.7 SEAL COAT

A. Allow new asphalt pavement to cure 30 days before application of seal coat. See Project Specification Section 32 12 36: Seal Coat.

3.8 FIELD QUALITY CONTROL

A. Thickness: Tolerances for asphalt pavement thickness shall be ¼ inch, plus or minus.

B. All paving shall drain properly before being accepted. Upon completion, the pavement shall be true to grade and cross section. The asphalt substrate, shall not vary from the planned cross slope by more than +- 0.1. When a 10 foot straightedge is laid on the finished surface of the asphalt, the surface shall not vary from the edge of the straightedge more than 1/8 inch, except at grade breaks. Where paving does not meet these tolerances, the paving material shall be repaired by a method determined by the Owner. Repairs shall not be made to pavement surface by feather-edging at the join lines. All expenses for pavement repair up shall be borne by the Contractor at NO cost to the Owner.

C. Corrective Measures: It is the Contractor's responsibility to determine if the planarity, cross slopes, and general specifications have been met. If all of the conditions have been met the Contractor must notify the Owner in writing of the acceptance of the asphalt paving.

3.10 PROTECTION

A. Protect the Work of this section until Substantial Completion.

3.11 CLEAN UP

A. Clean all debris and unused materials from the paving operation. Clean all surfaces that have been spattered or defaced as a result of the paving operation. Asphalt or asphalt stains which are noticeable upon surfaces of concrete, or materials which will be exposed to view, shall be promptly and completely removed. Cleaning shall be done in a manner that will not result in any discharge of contaminated materials into any catch basin. All expenses for clean up shall be borne by the Contractor at NO cost to the Owner.

END OF SECTION

SECTION 32 12 36
SEAL COATS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Surface sealer over new asphalt paved surfaces.

1.02 REFERENCES

A. Conform to Section 203 and 302 of the Standard Specifications for Public Works Construction.

B. Comply with International Slurry Surfacing Association (ISSA) performance guidelines.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's product information and application procedures for bituminous surfacing.

1.04 QUALITY ASSURANCE

A. Comply with the following as a minimum requirement: Standard Specifications Section 203-9, “SEALCOAT – ASPHALT BASED”.

B. Obtain materials from same source throughout.

C. Schedule a pre-construction conference at jobsite in advance of beginning of Work. In existing areas to be seal coated and restriped, document existing striping to be duplicated before commencing seal coating work.

D. Review and resolve conflicts involving requirements of specifications. Record discussions and furnish copies to all attendees.

E. Beginning of Work means Contractor accepts all conditions.

F. Agitate bulk materials during transport.

1.05 REGULATORY REQUIREMENTS

A. Comply with local air quality management district regulations for emissions maximums.

B. Maintain control of vehicular and pedestrian traffic during seal coating operations as required for other construction activities and in accordance with local traffic authorities having jurisdiction.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Seal Coat: The materials for sealcoat shall conform to Section 203-9 – "Sealcoat – Asphalt Based" of the Standard Specifications. Before incorporation in the Work, the Contractor shall submit a 2 Liter (2-quart) sample of undiluted seal coat at no cost to the Owner.

1. Seal Coat: Provide one of the following surface seals:

Product Name	Manufacturer
GuardTop	Vulcan Materials Company
Over Kote	Diversified Asphalt Product
Park Top	Western Colloid Products
Sure Seal	Asphalt Coating Engineering
MasterSeal	SealMaster Pavement Products & Equipment

B. Crack Sealing: Crack sealant shall be CalSeal Modified Asphalt joint sealant as manufacturered by Henry Inc, Crafco Polyflex Type 3 or equal.

PART 3 - EXECUTION

3.01 REPAIRING AND SEALCOATING OF SURFACES

A. Preparation of Surfaces:

1. DO NOT INSTALL SEAL COAT ON ASPHALT THAT IS TO RECEIVE COLOR COATING.

2. Before placing the sealcoat, the pavement surface shall be cleaned by sweeping, flushing or other means necessary to removal all loose particles of paving, all dirt, and all other extraneous material. This shall include vegetation in pavement cracks and between pavement and curb/gutter. Prior to removal an approved herbicide, which leaves behind a visible blue marker dye, shall be sprayed where vegetation exists. Surface contaminates, grease or oil spots shall be cleaned to allow for proper adhesion.

3. Prior to applying sealcoat material, cracks wider then 1/8 inch shall be cleaned, treated with weed killer, and filled with an asphalt-based crack filler (large cracks may require several applications). For best quality, it is recommended that all broken asphalt be removed and patched with new asphalt. It is also suggested that extreme low spots be filled with new asphalt. New asphalt must cure 30 days before application of sealcoat.

4. Immediately before commencing the sealcoat operations, all surface metal utility covers (including survey monuments) shall be protected by thoroughly

covering the surface with an appropriate adhesive and oiled or plastic paper. No adhesive material shall be permitted to cover, seal or fill the joint between the frame and cover of the structure. A vertical tab shall be placed on each cover for locating after the seal application is complete. The tab shall extend at least 3" above the existing pavement surface. Covers are to be uncovered and cleaned of asphalt emulsion material by the end of the same work day. Inspector shall inspect surfaces before the installation of seal coat.

5. For best results, the asphalt, just prior to being sealed, should be sprayed with a mist of water in an amount that will leave the surface damp but with no puddles or visible water. This procedure is critical when ambient temperature is hot with bright sunlight or when the pavement is excessively aged or porous.

6. A prime or tack coat may be necessary on surfaces that have weathered excessively or are dusted. The primer should be diluted with three parts clean, potable water and one part SS-1h emulsion and shall be applied at the rate of 0.05 gallon per square yard.

7. Install barricades as required to divert traffic from operations. Install temporary "no parking" signs and similar notices.

B. Application:

1. Sealcoat may be mixed with water to obtain desired consistency for job requirements to a maximum of 20% of the total volume. Care should be taken not to over dilute. Material after dilution shall be mixed with a mechanical agitator to maintain consistency and ease of application. Note that as the pavement increases in roughness, the amount of dilution should be decreased.

2. Sealcoat shall only be applied when the atmospheric temperature is greater than 55 degrees F and if rain is not forecast for the period of 24 hours after application.

3. The sealcoat material shall be applied in two applications. Unless otherwise specified, the total quantity applied (before dilution) shall be 50 gallons per 1,000 square feet.

4. Sealcoat material shall be applied using a truck-mounted tank or wheeled container in continuous parallel lines and spread by means of brooms or rubber-faced squeegees either by hand or machine and in such a manner as to eliminate all ridges, lap marks, and air pockets.

5. Hand tools shall be available in order to remove spillage. Ridges or bumps in the finished surface will not be permitted. Sealcoat material shall be homogeneous prior to spreading, with no visible separation of solids and liquids.

6. When the first coat has completely dried to the touch, apply the second coat. While misting is not normally required before second coat, surface should be clean with no foreign materials on it.

C. Drying Time:

1. Sealcoat should be allowed to dry 24 – 48 hours before permitting traffic. When asphalt is cold or in shade, or air temperature is below 75 degrees F, based on general weather, humidity and temperature conditions, drying time may need to be extended.

3.02 CLEAN UP

A. Remove rubbish, debris and waste materials and legally dispose of off the Project site.

B. Striping for parking or traffic flow should be done only after the sealcoat has thoroughly dried. It is recommended that a high quality water based Traffic Line Paint be used for best results.

3.03 PROTECTION

A. Protect the Work of this section until Substantial Completion.

END OF SECTION

SECTION 32 13 13
CONCRETE PAVING

PART 1 - GENERAL

1.01 THE REQUIREMENT

A. The CONTRACTOR shall furnish all materials for concrete in accordance with the provisions of this Section and shall form, mix, place, cure, repair, finish, and do all other work as required to produce finished concrete, in accordance with the requirements of the Contract Documents.

B. The following types of concrete shall be covered in this Section:

1. Portland cement concrete pavement, cement walks, flatwork, curbs, gutters, retaining curbs, swales, trash pick-up areas, ramps, mowing strips, fence post footings, sliding gate concrete, catch basins, pipe bedding and encasements, transition structures, flagpoles and light standard bases and footings, splash blocks and equipment pads.

2. Portland cement concrete paving shall be stable, firm and slip resistant and shall comply with CBC sections 11B-302 and 11B-403.

1.02 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Comply with the reference specifications of the GENERAL REQUIREMENTS.

B. The work provided herein shall conform to and be in accordance with the Contract Plans, General Conditions/Specifications and Special Provisions, as well as the Standard Specifications for Public Works Construction (“GREENBOOK”), 2024 Edition, adopted by the Southern California Chapter, American Public Works Association; herein referred to as the “Standard Specifications” and the 2025 California Building Code.

C. Comply with the current provisions of the following Codes and Standards.

1. Federal Specifications:

a. UU-B-790A (Int.Amd.1) Building Paper, Vegetable Fiber (Kraft, Waterproofed, Water Repellant and Fire Resistant).

2. Commercial Standards:

a. ACI 214 Recommended Practice for Evaluation of Strength Test Results of Concrete.

b. ACI 301 Specifications for Structural Concrete for Buildings.

c. ACI 315 Details and Detailing of Concrete Reinforcement.

d. ACI 318-14 Building Code Requirements for Reinforced Concrete.

e. ACI 347 Recommended Practice for Concrete Formwork.

f. ACI 350 Recommended Practice for Sanitary Structure.

g. ASTM C 31 Practices for Making and Curing Concrete Test Specimens in the Field.

h. ASTM C 33 Specification for Concrete Aggregates.

i. ASTM C 39 Test Method for Compressive Strength of Cylindrical Concrete Specimens.

j. ASTM C 40 Test Method for Organic Impurities in Fine Aggregates for Concrete.

k. ASTM C 42 Methods of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.

l. ASTM C 78 Specification for Flexural Strength.

m. ASTM C 88 Test Method for Soundness of Aggregates by use of Sodium Sulfate or Magnesium Sulfate.

n. ASTM C 94 Specification for Ready-Mixed Concrete.

o. ASTM C 114 Method for Chemical Analysis of Hydraulic Cement.

p. ASTM C 131 Test Method for Resistance to Degradation of Small-Sized Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

q. ASTM C 136 Method for Sieve Analysis of Fine and Coarse Aggregate.

r. ASTM C 143 Test Method for Slump of Portland Cement Concrete.

s. ASTM C 150 Specification for Portland Cement.

t. ASTM C 156 Test Method for Water Retention by Concrete Curing Materials.

u. ASTM C 157 Test Method for Length Change of Hardened Hydraulic Cement Mortar and Concrete.

v. ASTM C 172 Specification for Sampling Fresh Concrete.

w. ASTM C 192 Method of Making and Curing Concrete Test Specimens in the Laboratory.

x. ASTM C 260 Specification for Air-Entraining Admixtures for Concrete.

y. ASTM C 289 Test Method for Potential Reactivity of Aggregates (Chemical Method).

z. ASTM C 311 Method for Sampling and Testing Fly Ash or Natural Pozzolans for Use as a Mineral Admixture in Portland Cement Concrete.

aa. ASTM C 494 Specification for Chemical Admixtures for Concrete.

bb. ASTM C 618 Specification for Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete.

cc. ASTM C 979 Specification for Pigments for Integrally Colored Concrete

dd. ASTM D 1751 Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types).

ee. ASTM E 119 Method for Fire Tests of Building Construction and Materials.

1.03 CONTRACTOR SUBMITTALS

A. Submittals shall be made in accordance with GENERAL REQUIREMENTS.

B. The following submittals and specific information shall be provided.

1. Mix Designs: Prior to beginning the WORK, the CONTRACTOR shall submit to the ENGINEER, for review, and approval, preliminary concrete mix designs for each class and type of concrete specified herein. The mix designs shall be designed by an independent testing laboratory acceptable to the ENGINEER. All costs related to such mix design shall be borne by the CONTRACTOR.

a. Each concrete mix submittal shall contain the following information:

1) Slump on which the design is based.

2) Total gallons of water per cubic yard.

3) Brand, type, composition and quantity of cement.

4) Brand type, composition and quantity of fly ash.

5) Specific Gravity and gradation of each aggregate.

6) Ratio of fine to total aggregate per cubic yard.

7) Weight (surface dry) of each aggregate per cubic yard.

8) Brand, type, and ASTM designation, active chemical ingredients and quantity of each admixture.

9) Copy of the Building and Safety Research Report Approval for each concrete admixture.

10) Air content.

11) Compressive strength based on 7 day and 28 day compression tests, including standard deviation calculations, corroborative data (if applicable), and required average comprehensive strength per ACI 318, Section 5.

12) Time of initial set.

13) Certification stamp and signature by a Civil or Structural engineer registered in state of California.

14) Certificate of Compliance for Cement.

2. Certified Delivery Tickets: Where ready-mix concrete is used, the CONTRACTOR shall provide certified weighmaster delivery tickets at the time of delivery of each load of concrete. Each certificate shall show the public weighmaster's signature, and the total quantities, by weight of cement, sand, each class of aggregate, admixtures, and the amounts of water in the aggregate and added at the batching plant as well as the amount of water allowed to be added at the site for the specific design mix. Each certificate shall, in addition, state the mix number, total yield in cubic yards, and the time of day, to the nearest minute, corresponding to when the batch was dispatched, when it left the plant, when it arrived at the job, the time that unloading began, and the time that unloading was finished.

3. When a water reducing admixture is to be used, the CONTRACTOR shall furnish mix designs for concrete both with and without the admixture.

4. The CONTRACTOR shall furnish a Certificate of Compliance signed by the supplier identifying the type of fly ash and stating that the fly ash complies with ASTM C 618 and these Specifications, together with all supporting test data prior to the use of the fly ash the sample represents. The supporting data shall also contain test results confirming that the fly ash in combination with the cement and water to be used meets all strength requirements and is compatible with air-entraining agents and other admixtures.

5. The CONTRACTOR shall submit to the ENGINEER for review the design mix for fly ash concrete together with the design mix for portland cement (non-fly ash) concrete as specified in this Section.

1.04 QUALITY ASSURANCE

A. Testing for Portland Cement Concrete shall be sampled and tested in accordance with the ASTM and California Tests listed in the Standard Specifications for Public Works Construction, 2024 Edition, Section 201-1.7 Tests.

B. Samples for strength tests of each class of concrete placed each day shall be taken not less than once a day, or not less than once for each 50 cubic yards of concrete, or not less than once for each 2,000 square feet of surface area for slabs. Additional samples for seven-day compressive strength tests shall be taken for each class of concrete at the beginning of the concrete work or whenever the mix or aggregate is changed.

C. The cost of all laboratory tests on cement, aggregates, and concrete, will be borne by the CONTRACTOR.

D. Concrete for testing shall be supplied by the CONTRACTOR at no cost to the Owner, and the CONTRACTOR shall provide assistance and facilities to the INSPECTOR in obtaining samples, and disposal and cleanup of excess material.

E. Curbs and gutters shall be staked by a Land Surveyor licensed to practice in the State of California.

F. Job Mock-Up

1. General

a. Make samples on-site; revise as required; obtain Architect's approval, 10 days prior to casting finished work.

b. Finished work to match approved samples.

c. Approved sample may be incorporated into the work. Retain samples until completion of all concrete work.

d. Include typical tooled joint control in sample.

2. Broom Finished Concrete; Exterior Flatwork: Provide sample, 20 s.f. minimum area.

3. “Sacked” Vertical Surface; Exterior Wall: Provide sample, 5 sf. minimum area.

G. Construction Tolerances: The CONTRACTOR shall set and maintain concrete forms and perform finishing operations so as to ensure that the completed work is within the tolerances specified herein. Surface defects and irregularities are defined as finishes and are to be distinguished from tolerances. Tolerance is the specified permissible variation from lines, grades, or dimensions shown. Where tolerances are not stated in the specifications, permissible deviations will be in accordance with ACI 347.

H. Construction tolerances shall not violate dimensions, grades, slopes required by CBC for accessibility requirements. Adjust work accordingly to comply with requirements.

I. The following construction tolerances are hereby established and apply to finished walls and slab unless otherwise shown:

Item	Tolerance
Variation of the constructed linear outline from the established position in plan.	In 10 feet: 1/8-inch; In 20 feet or more: 1/4-inch
Variation from the level or from the grades shown.	In 10 feet: 1/8-inch; In 20 feet or more: 1/4-inch
Variation from the plumb	In 10 feet: 1/8-inch; In 20 feet or more: 1/4-inch
Variation in the thickness of slabs and walls.	Minus 1/8-inch; Plus 1/4-inch
Variation in the locations and sizes of slabs and wall openings.	Plus or minus 1/8-inch

PART 2 - PRODUCTS

2.01 CONSTRUCTION MATERIALS

A. Materials shall be delivered, stored, and handled so as to prevent damage by water or breakage. Only one brand of cement shall be used. Cement reclaimed from cleaning bags or leaking containers shall not be used. All cement shall be used in the sequence of receipt of shipments.

B. All materials furnished for the work shall comply with the requirements of Sections 201, 203, and 204 of ACI 301, as applicable.

C. Storage of materials shall conform to the requirements of Section 205 of ACI 301.

D. Form Materials: Plywood, metal, metal-framed plywood, or other acceptable panel-type materials to provide full-depth, continuous, straight, smooth exposed surfaces. Conform to Section 303-5.2 of the Standard Specifications.

1. Use flexible or curved forms for curves of a 100-foot or less radius.

E. Reinforcing Materials: As follows:

1. Steel Reinforcing Bars: ASTM A 615 deformed grade 60 billet steel, plain finish, unless otherwise specified on Construction Document. Fabrication, sampling and jobsite handling shall conform to the requirements in ASTM Designation: D 3963, except the 2 samples shall be 30 inches long.

2. Dowels:

a. Dowel bars shall be plain round smooth conforming to the requirements in ASTM Designation: A 615/A 615M, Grade 60 except that the two samples required in ASTM Designation: D 3963/D 3963M shall be 18 inches long. Dowel bars shall be free from burrs or other deformations detrimental to free movement of the bars in the concrete

b. Dowel bars shall be lubricated with a bond breaker over the entire bar. A bond breaker application of petroleum paraffin based lubricant or white-pigmented curing compound shall be used to coat the dowel bars completely prior to placement. Oil and asphalt based bond breakers shall not be used. Paraffin based lubricant shall be Dayton Superior DSC BB-Coat or Valvoline Tectyl 506 or an approved equal. Paraffin based lubricant shall be factory applied. White pigmented curing compound shall conform to the requirements of ASTM Designation: C 309, Type 2, Class A, and shall contain 22 percent minimum nonvolatile vehicles consisting of at least 50 percent paraffin wax. Curing compound shall be applied in 2 separate applications, the last application not more than 8 hours prior to placement of the dowel bars. Each application of curing compound shall be applied at the approximate rate of one gallon per 15 square yards.

3. Epoxy for bonding tie bars and dowel bars to portland cement concrete shall be a two-component, epoxy-resin, conforming to the requirements of ASTM Designation: C 881, Type V, Grade 3 (Non-Sagging), Class B or C. The class used shall be dependent on the internal temperature of the hardened concrete at the time the epoxy is to be applied. Class B shall be used when the internal temperature is from 40 °F to 60 °F. Class C shall be used when the internal temperature is above 60 °F, but not higher than recommended by the manufacturer. A copy of the manufacturer's recommended installation procedure shall be provided to the Engineer at least 7 days prior to the start of work. Epoxy shall be applied in conformance with the manufacturer's recommendations.

a. Simpson Set-3G Epoxy Adhesive (or approved equal) ICC-ES ESR-4057.

F. Concrete Materials: As follows:

1. Cement shall be standard brand portland cement conforming to ASTM C 150 for Type II. Portland cement shall contain not more than 0.60 percent alkalies. The term "alkalies" referred to herein is defined as the sum of the percentage of sodium oxide and 0.658 times the percentage of potassium oxide (Na20 + 0.658 K20). These oxides shall be determined in accordance with ASTM C 114. A single brand of cement shall be used throughout the work, and prior to its use, the brand shall be acceptable to the ENGINEER. The cement shall be suitably protected from exposure to moisture until used. Cement that has become

lumpy shall not be used. Sacked cement shall be stored in such a manner so as to permit access for inspection and sampling. Certified mill test reports for each shipment of cement to be used shall be submitted to the INSPECTOR.

2. Concurrent with strength design criteria, concrete shall also be proportioned to provide the requisite durability to satisfy the exposure conditions imposed by either environment and/or service. Durability, in this context, refers to the ability of the concrete to resist deterioration from the environment or service in which it is placed. Concrete proportioned in accordance with ACI 318, chapter 4, Durability Requirements, will meet this criteria.

3. Combined Aggregate: 1" maximum coarse aggregate size conforming to Grading C of Standard Specifications Section 201-1.3.2(A). Aggregates shall be obtained from pits acceptable to the INSPECTOR, shall be non-reactive, and shall conform to ASTM C 33.

4. Water: Shall be potable, clean, and free from objectionable quantities of silty organic matter, alkali, salts and other impurities. The water shall be considered potable, for the purposes of this Section only, if it meets the requirements of the local governmental agencies.

5. *"Pea gravel" mix is not acceptable,* unless specifically approved in writing by the Civil Engineer of Record prior to construction.

G. Admixtures:

1. The ENGINEER may require the use of admixtures or the CONTRACTOR may propose to use admixtures to control the set, effect water reduction, and increase workability. In either case, the addition of an admixture shall be at the CONTRACTOR's expense. The use and continued use of an admixture shall be approved by the ENGINEER. Admixtures specified herein, other than calcium chloride, shall conform to the requirements of ASTM C 494. The required quantity of cement shall be used in the mix regardless of whether or not an admixture is used. Admixtures shall contain no free chloride ions, be non-toxic after 30 days, and shall be compatible with and made by the same manufacturer as the air entraining admixture.

2. These admixtures shall not be used in greater doses than those recommended by the manufacturer or permitted by the ENGINEER. The permitted dosage of the admixture shall not exceed that which will result in an increase in the driving shrinkage of the concrete in excess of 20 percent when used in precast or prestressed concrete, or 10 percent when used in any other structural concrete. The strength of concrete containing the admixture in the amount of proposed shall, at the age of 48 hours and longer be not less than that of similar concrete without the admixture. The admixture shall not adversely affect the specified air content, unless permitted by the ENGINEER.

3. Set controlling admixture shall be either with or without water-reducing properties. Where the air temperature at the time of placement is expected to be consistently over 80 degrees F, a set retarding admixture such as [Sika Chemical Corporation's Plastiment], [Master Builder's Pozzolith 300R], or equal shall be used. Where the air temperature at the time of placement is expected to be consistently under 40 degrees F, a set accelerating admixture such as [Sika Chemical Corporation's Plastocrete 161FL], [Master Builder's Pozzolith 50C], or equal shall be used.

4. Low range water reducer shall conform to ASTM C 494, Type A. It shall be either a hydroxylated carboxylic acid type or a hydroxylated polymer type. The quantity of admixture used and the method of mixing shall be in accordance with the manufacturer's instructions and recommendations.

5. High range water reducer shall be sulfonated polymer conforming to ASTM C 494, Type F or G.

    a. If the high range water reducing agent is added to the concrete at the batch plant, it shall be second generation type, [Daracem 100, as manufactured by W.R. Grace & Co.]; [Pozzolith 430R, as manufactured by Masterbuilders]; or equal. High range water reducer shall be added to the concrete after all other ingredients have been mixed and initial slump has been verified.

    b. If the high range water reducer is added to the concrete at the job site, it shall be used in conjunction with a low range water reducer and shall be [Pozzolith 400N and Pozzolith MBL82, as manufactured by Masterbuilders]; [WRDA 19 and WRDA 79, as manufactured by W.R. Grace & Co.]; or equal. Concrete shall have a slump of 3-inches ± 1/2-inch prior to adding the high range water reducing admixture at the job site. The high range water reducing admixture shall be accurately measured and pressure injected into the mixer as a single dose by an experienced technician. A standby system shall be provided and tested prior to each day's operation of the job site system.

6. Air-entraining agent meeting the requirements of ASTM C 260, shall be used. Sufficient air-entraining agent shall be used to provide a total air content of 3 to 4 percent; provided that, when the mean daily temperature in the vicinity of the worksite falls below 40 degrees F for more than one day, the total air content provided shall be 5 to 6 percent. The Owner reserves the right, at any time, to sample and test the air-entraining agent received on the job by the CONTRACTOR. The air-entraining agent shall be added to the batch in a portion of the mixing water. The solution shall be batched by means of a mechanical batcher capable of accurate measurement.

7. Calcium Chloride: Except as otherwise provided herein, calcium chloride will not be permitted to be used in concrete.

8. Fly ash/pozzolan shall conform to ASTM C 618 and the following supplementary requirements:

   a. Class F fly ash

o Loss on ignition,	maximum 4 percent
o S03 content,	maximum 3 percent
o Moisture content,	maximum 1 percent

   b. Class F fly ash, as a percent by weight of total cementitious material, shall not exceed 15 percent.

   c. When Sulfate Resistant or Special Exposure Concrete is specified, test results shall be submitted to the Engineer as specified in Section 2-5.3 of the Standard Specifications. The test result shall show that the fly ash to be used is effective in contributing to sulfate resistance in conformance with ASTM C618, Table 3 (optional physical requirements) as tested in accordance with ASTM C 1012. The data submitted shall be less than 6 months old.

H. Curing Materials:

1. Concrete curing compound shall conform to the requirements of ASTM C309 Type 1-D (clear or translucent with a fugitive dye), Class B (Resin Type Only), except the loss of water shall not exceed 0.15 kilograms per square meter in 24 hours nor 0.45 kilograms per square meter in 72 hours when tested in accordance with ASTM C 156. The CONTRACTOR shall provide, when requested by the ENGINEER, certified copies of vendor's test report showing compliance with ASTM C 309 and these specifications. The testing and the report shall be supplied without cost to the Agency. All compounds shall be furnished by the CONTRACTOR in sealed original containers labeled in accordance with ASTM C 309 and with the date of manufacture.

2. Polyethylene sheet for use as concrete curing blanket shall be white and conform to ASTM C 171. The loss of moisture when determined in accordance with the requirements of ASTM C 156 shall not exceed 0.055 grams per square centimeter of surface.

3. Polyethylene-coated burlap for use as concrete curing blanket shall conform to ASTM C 171. The loss of moisture, when determined in accordance with the requirements of ASTM C 156, shall not exceed 0.055 grams per square centimeter of surface.

I. Expansion Joint Filler Material

1. Fiber expansion joint, W.R. Meadows, or approved equal, 1/2-inch thick material conforming to ASTM D 1751.

2. Silicone Joint Sealant: Premium-grade, high-performance, moisture-cured, single-component, polyurethane-based, non-sag elastomeric sealant. Meets Federal specification TT-S-00230C. Meets ASTM C-920, Type S, Class 25 or 35; Grade NS, Use T or NT, Shore A Hardness (21 day) 35-45. A Certificate of Compliance for the silicone sealant shall be furnished to the Engineer. The Certificate shall also be accompanied with a certified test report of the results of the required tests performed on the sealant material within the previous 12 months prior to proposed use. The Certificate and accompanying test report shall be provided for each lot of silicone joint sealant prior to use on the project.

   a. Sika Corporation, Sikaflex 1c SL or approved equal.

J. Related Materials: As follows:

1. Damp-proofing agent shall be an asphalt emulsion, such as [Sonneborn Hydrocide 660], [Flintkote C-13-E Foundation Coating], or equal.

2. Epoxy adhesives shall be the following products for the applications specified:

   a. For bonding freshly-mixed, plastic concrete to hardened concrete, [Sikadur Hi-Mod Epoxy Adhesive, as manufactured by Sika Chemical Corporation]; [Concresive 1001-LPL, as manufactured by Adhesive Engineering Company]; or equal.

   b. For bonding hardened concrete or masonry to steel, [Colma-Dur Gel], [Sikadur Hi-Mod Gel], or equal.

K. Site Concrete Mix Design: At a minimum, site work concrete (flatwork and curbs) shall conform to the Standard Specifications for Public Works Construction, Section 201-1.1.2 mix class 560-C-3250.

1. Compressive Strength: minimum of 3,250 psi at 28 days compressive strength.

2. Slump Limit: 4 inches at point of placement.

3. Air Content: 4% +/- 1% percent.

L. Slurry Mix Design:

1. Compressive Strength: 100 psi at min. 28 days compr. strength.

2. Slump Limit: 5 inches at point of placement.

3. Cement per cu yard (sacks): 1.0

4. Aggregate Gradation: “E” per S.S.P.W.C. table 201-1.4.2.

PART 3 - EXECUTION

3.01 PREPARATION OF SURFACES FOR CONCRETING

A. General: Earth surfaces shall be thoroughly wetted by sprinkling, prior to the placing of any concrete, and these surfaces shall be kept moist by frequent sprinkling up to the time of placing concrete thereon. The surface shall be free from standing water, mud, and debris at the time of placing concrete.

B. Subgrade Preparation:

1. Refer to Concrete Pavement Detail 1 on sheet C3.00 of the construction documents.

C. The subgrade preparation recommendations on C3.00 are based on the assumption that soils encountered during field exploration are representative of soils throughout the site. However, there can be unforeseen and unanticipated variations in soils between points of subsurface exploration. For this reason, the actual scarification or over-excavation depths will have to be determined on the basis of in-grading observations and testing performed by representatives of the project geotechnical consultant.

D. A California Licensed Surveyor (LS) must provide grade stakes and elevations for the Geotechnical Engineer to verify that the over-excavation depths, shown on the construction drawings for concrete pavement structural sections, have been achieved prior to re-compaction.

E. Joints in Concrete: Concrete surfaces upon or against which concrete is to be placed, where the placement of the old concrete has been stopped or interrupted so that, as determined by the ENGINEER, the new concrete cannot be incorporated integrally with that previously placed, are defined as construction joints. The surfaces of horizontal joints shall be given a compacted, roughened surface for good bond. Except where the Drawings call for joint surfaces to be coated, the joint surfaces shall be cleaned of all laitance, loose or defective concrete, and foreign material. Such cleaning shall be accomplished by sandblasting followed by thorough washing. All pools of water shall be removed from the surface of construction joints before the new concrete is placed.

F. Embedded Items: No concrete shall be placed until all formwork, installation of parts to be embedded, reinforcement steel, and preparation of surfaces involved in the placing have been completed and ACCEPTED by the INSPECTOR at least 24 hours before placement of concrete. All surfaces of forms and embedded items that have become encrusted with dried grout from concrete previously placed shall be cleaned of all such grout before the surrounding or adjacent concrete is placed.

G. All inserts or other embedded items shall conform to the requirements herein.

H. All reinforcement, anchor bolts, sleeves, inserts, and similar items shall be set and secured in the forms where shown or by shop drawings and shall be acceptable to the INSPECTOR before any concrete is placed. Accuracy of placement is the responsibility of the CONTRACTOR.

I. Where concrete is to be cast against old concrete, (greater than 60 days of age), the surface of the old concrete shall be thoroughly cleaned and roughened by sand-blasting, exposing the aggregate. In concrete shear-walls, suspended slabs and roof slabs, the interface surface at construction joints shall be roughened to a full amplitude of one quarter inch. The hardened surface shall be cleaned of all latent foreign material and washed clean, prior to the application of an epoxy bonding agent.

J. No concrete shall be placed in any structure until all water entering the space to be filled with concrete has been properly cut off or has been diverted by pipes, or other means, and carried out of the forms, clear of the work. No concrete shall be deposited underwater nor shall the CONTRACTOR allow still water to rise on any concrete until the concrete has attained its initial set. Water shall not be permitted to flow over the surface of any concrete in such manner and at such velocity as will injure the surface finish of the concrete. Pumping or other necessary dewatering operations for removing ground water, if required, will be subject to the review of the ENGINEER.

K. Corrosion Protection: Pipe, conduit, dowels, and other ferrous items required to be embedded in concrete construction shall be so positioned and supported prior to placement of concrete that there will be a minimum of 2-inches clearance between said items and any part of the concrete reinforcement. Securing such items in position by wiring or welding them to the reinforcement will not be permitted.

L. Openings for pipes, inserts for pipe hangers and brackets, and the setting of anchors shall, where practicable, be provided for during the placing of concrete.

M. Anchor bolts shall be accurately set, and shall be maintained in position by templates while being embedded in concrete.

N. Cleaning: The surfaces of all metalwork to be in contact with concrete shall be thoroughly cleaned of all dirt, grease, loose scale and rust, grout, mortar, and other foreign substances immediately before the concrete is placed.

3.02 HANDLING, TRANSPORTING, AND PLACING

A. General: Placing of concrete shall conform to the applicable requirements of ACI 301 and the requirements of this Section.

B. The total elapsed time between the addition of water at the batch plant and the completion of the discharge of the P.C.C. from the mixer shall not exceed 90 minutes. All P.C.C. remaining in the mixer after said 90-minute time limit shall be rejected and removed from the project site.

C. Non-Conforming Work or Materials: Concrete which upon or before placing is found not to conform to the requirements specified herein shall be rejected and immediately removed from the work. Concrete which is not placed in accordance with these Specifications, or which is of inferior quality, shall be removed and replaced by and at the expense of the CONTRACTOR.

D. Whenever batch trucks or other paving equipment cause rutting of the subgrade or subbase in concrete placement areas, inspectors shall immediately stop construction. Construction shall not be allowed to resume until distorted subgrade or subbase is repaired. Contractors and inspectors should locate by proof rolling, any questionable unstable areas in advance to avoid distortion under equipment. Wet, unstable areas must be dried out or replaced before starting placement of asphalt. Locating wet or soft areas in advance can be accomplished by testing finished subgrade or subbase with a loaded truck. Construction of concrete pavement should not proceed unless testing gives a reasonable indication that distortions will not occur during construction of overlying pavement. When repair, aeration, and recompaction are required to correct damage from Contractor's operation, all necessary repair will be done at Contractor's expense. However, if the Engineer determines that additional depth of aeration and recompaction are needed, that should be paid by change order.

E. All pull boxes, meter boxes, valve covers and manholes shall be adjusted to proposed finish grade prior to placement of the P.C.C.

F. Dowel Placement:

1. Dowel bars shall be centered on the joint within a tolerance of ±2 inches in the longitudinal direction directly over the contact joint or sawcut for the transverse weakened plane joints, as shown on the plans. Prior to placement of dowel bars, the Contractor shall submit to the Engineer a written procedure to identify the transverse weakened plane joint locations relative to the middle of the dowel bars and the procedure for consolidating concrete around the dowel bars.

2. Dowel bars shall be placed at longitudinal joints as shown on the plans. Dowel bars shall be placed as shown on the plans by using mechanical insertion. When dowel bars are placed by mechanical insertion, the concrete over the dowel bars shall be reworked and refinished so that there is no evidence on the surface of the completed pavement that there has been any insertion performed. When drill and bonding of dowel bars is performed at contact joints, a grout retention ring shall be used.

G. Concrete shall not be placed until the forms and reinforcement have been inspected, all preparations for the placement have been completed, and the preparations have been checked by the project inspector, all subject to the observation of the engineer or architect.

H. Casting New Concrete Against Old: An approved epoxy adhesive bonding agent shall be applied to the old surfaces according to the manufacturer's written recommendations. This provision shall not apply to joints where waterstop is installed.

I. Conveyor Belts and Chutes: All ends of chutes, hopper gates, and all other points of concrete discharge throughout the CONTRACTOR'S conveying, hoisting and placing system shall be so designed and arranged that concrete passing from them will not fall

separated into whatever receptacle immediately receives it. Conveyor belts, if used, shall be of a type acceptable to the INSPECTOR. Chutes longer than 50 feet will not be permitted. Minimum slopes of chutes shall be such that concrete of the specified consistency will readily flow in them. If a conveyor belt is used, it shall be wiped clean by a device operated in such a manner that none of the mortar adhering to the belt will be wasted. All conveyor belts and chutes shall be covered. Sufficient illumination shall be provided in the interior of all forms so that the concrete at the places of deposit is visible from the deck or runway.

J. Placement in Slabs: Concrete placed in sloping slabs shall proceed uniformly from the bottom of the slab to the top, for the full width of the pour. As the work progresses, the concrete shall be vibrated and carefully worked around the slab reinforcement, and the surface of the slab shall be screeded in an up-slope direction.

K. Temperature of Concrete: The temperature of concrete when it is being placed shall be not more than 90 degrees F nor less than 40 degrees F in moderate weather, and not less than 50 degrees F in weather during which the mean daily temperature drops below 40 degrees F. Concrete ingredients shall not be heated to a temperature higher than that necessary to keep the temperature of the mixed concrete, as placed, from falling below the specified minimum temperature. If concrete is placed when the weather is such that the temperature of the concrete would exceed 90 degrees F, the CONTRACTOR shall employ effective means, such as precooling of aggregates and mixing water using ice or placing at night, as necessary to maintain the temperature of the concrete, as it is placed, below 90 degrees F. The CONTRACTOR shall be entitled to no additional compensation on account of the foregoing requirements.

L. Cold Weather Placement: Earth foundations shall be free from frost or ice when concrete is placed upon or against them. Fly ash concrete shall not be placed when the air temperature falls below 50 degrees F.

M. A transverse construction joint shall be constructed, including dowel bars, at the end of each day's work or where concrete placement is interrupted for more than 30 minutes, to coincide with the next contraction joint location. If sufficient concrete has not been mixed to form a slab to match the next contraction joint, when an interruption occurs, the excess concrete shall be removed and disposed of back to the last preceding joint. The cost of removing and disposing of excess concrete shall be at the Contractor's expense. Excess material shall become the property of the Contractor and shall be disposed of. A metal or wooden bulkhead (header) shall be used to form the joint. The bulkhead shall be designed to accommodate the installation of dowel bars.

N. Float Finish: Begin floating when bleed water sheen has disappeared and the concrete surface has stiffened sufficiently to permit operations. Float surfaces to true planes within a tolerance of 1/4 inch in 10 feet as determined by a 10-foot-long straightedge placed anywhere on the surface in any direction. The finished surface shall be free from humps, sags, blemishes or other irregularities Cut down high spots and fill low spots. Refloat surface immediately to a uniform granular texture.

O. Broom Finish Type:

1. Surfaces Sloped Less than 6%: Provide a medium salt (medium broom) finish by drawing a soft bristle broom across concrete surface, perpendicular to line of traffic, to provide a uniform fine line texture.

2. Surfaces Sloped greater than 6%: Provide a slip resistant (heavy broom finish) by striating surface 1/16 inch to 1/8 inch deep with a stiff-bristled broom, perpendicular to line of traffic.

P. Joints:

1. Joints: Joints in concrete curb, gutter and flatwork shall be designated as expansion joints and control joints. Joints for concrete flatwork shall be provided in spacing noted on the architectural plans. Expansion joints for curbs / curb & gutter shall be placed at no greater than 15 feet on center or as indicated on construction drawings.

a. Expansion Joints: Provide premolded joint filler, material meeting Section 2.01-I herein.

1) Extend expansion joint fillers full-width and depth of joint, and 1/4" below finished surface where joint filler is indicated. If no joint sealer is called for, place top of premolded joint filler flush with top of concrete or curb.

2) Where silicone joint sealer is noted on the construction documents, the premolded joint filler strips shall be placed 1” below the surface of the concrete or curb, the full width of the expansion joint. The remainder of all joints shall be filled to within 1/4” below the surface of the concrete with the silicone joint sealant.

3) Provide expansion joint filler strips, with elastomeric sealer, between p.c.c. walk and curb, p.c.c. walk and buildings, & p.c.c. walk and retaining walls and at locations noted on the construction documents. The depth of the filler strip shall be the depth of the p.c.c. walk plus 1 inch with the top set flush with the specified grade of the top of curb or walk.

b. Control Joints:

1) Control joints in site work concrete shall comply with details on sheet C3.00.

Q. Protection: In hot, dry, and windy weather protect concrete from rapid moisture loss before and during finishing operations with an evaporation-control film. Apply

according to manufacturer's instructions after screeding and bull floating, but before floating.

3.03 TAMPING AND VIBRATING

A. As concrete is placed in the forms or in excavations, it shall be thoroughly settled and compacted, throughout the entire depth of the layer which is being consolidated, into a dense, homogeneous mass, filling all corners and angles, thoroughly embedding the reinforcement, eliminating rock pockets, and bringing only a slight excess of water to the exposed surface of concrete during placement. Vibrators shall be high speed power vibrators (8000 to 10,000 rpm) of an immersion type in sufficient number and with (at least one) standby units as required.

B. Care shall be used in placing concrete around waterstops. The concrete shall be carefully worked by rodding and vibrating to make sure that all air and rock pockets have been eliminated. Where flat-strip type waterstops are placed horizontally, the concrete shall be worked under the waterstops by hand, making sure that all air and rock pockets have been eliminated. Concrete surrounding the waterstops shall be given additional vibration, over and above that used for adjacent concrete placement to assure complete embedment of the waterstops in the concrete.

C. Concrete in walls shall be internally vibrated and at the same time rammed, stirred, or worked with suitable appliances, tamping bars, shovels, or forked tools until it completely fills the forms or excavations and closes snugly against all surfaces. Subsequent layers of concrete shall not be placed until the layers previously placed have been worked thoroughly as specified. Vibrators shall be provided in sufficient numbers, with standby units as required, to accomplish the results herein specified within 15 minutes after concrete of the prescribed consistency is placed in the forms. The vibrating head shall be kept from contact with the surfaces of the forms. Care shall be taken not to vibrate concrete excessively or to work it in any manner that causes segregation of its constituents.

3.04 CURING

A. Comply with 2025 California Building Code, Title 24, Part 2, Volume 2, Section 1904A.

1. Begin final curing procedures immediately following initial curing and before concrete has dried. Continue final curing for at least seven (7) days in accordance with ACI 301 procedures. Avoid rapid drying at end of final curing period.

B. Curing Methods: Perform curing of concrete by curing as herein specified.

1. Provide moisture-curing by the following methods:

a. Keep concrete surface continuously wet by covering with water.

b. Continuous water-fog spray.

c. Covering concrete surface with specified absorptive cover, thoroughly saturating cover with water and keeping continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with 4 inch lap over adjacent absorptive covers.

2. Provide curing and sealing compound to exposed exterior slabs, walks, and curbs, as follows:

a. Apply specified curing and sealing compound to concrete slabs as soon as final finishing operations are complete (within 2 hours). Apply uniformly in continuous operation by power-spray or roller in accordance with manufacturer's directions. Re-coat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.

b. Do not use membrane curing compounds on surfaces which are to be covered with coating material applied directly to concrete, liquid, floor hardener, waterproofing, dampproofing, membrane roofing, flooring (such as ceramic or quarry tile, glue-down carpet), painting, and other coatings and finish materials, unless otherwise acceptable to Architect.

C. Concrete slabs and paving shall be properly cured and protected against damage and defacement of nature during construction operations. If weather is hot or surface has dried out, spray surface with fine mist of water starting not later than two hours after final troweling. Surface of finish shall be kept continuously wet for at least ten days. Wetting is considered emergency work and shall be performed on weekends and holidays if necessary.

D. The CONTRACTOR shall protect all concrete against injury or damage from excessive heat, lack of moisture, overstress, or any other cause until final acceptance by the Owner. Particular care shall be taken to prevent the drying of concrete and to avoid roughening or otherwise damaging the surface. Any concrete found to be damaged, or which may have been originally defective, or which becomes defective at any time prior to the final acceptance of the completed work, or which departs from the established line or grade, or which, for any other reason, does not conform to the requirements of the Contract Documents, shall be satisfactorily repaired or removed and replaced with acceptable concrete at the CONTRACTOR'S expense. Exclude traffic from concrete paving for at least 7 days after placement.

E. Maintain concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep concrete paving not more than 2 days prior to date scheduled for Substantial Completion inspections.

3.05 PUMPING OF CONCRETE

A. General: If the pumped concrete does not produce satisfactory end results, the CONTRACTOR shall discontinue the pumping operation and proceed with the placing of concrete using conventional methods.

B. Pumping Equipment: The pumping equipment must have 2 cylinders and be designed to operate with one cylinder only in case the other one is not functioning. In lieu of this requirement, the CONTRACTOR may have a standby pump on the site during pumping.

C. The minimum diameter of the hose (conduits) shall be 4-inches.

D. Pumping equipment and hoses (conduits) that are not functioning properly, shall be replaced.

E. Aluminum conduits for conveying the concrete will not be permitted.

F. Proportioning: Minimum compressive strength, cement content, and maximum size of aggregates shall be as specified herein.

G. Gradation of coarse aggregates shall conform to ASTM C 33 and shall be as close to the middle range as possible.

H. Gradation of fine aggregate shall conform to ASTM C 33, with 15 to 30 percent passing the number 50 screen and 5 to 10 percent passing the number 100 screen. The fineness modulus of sand used shall not be over 3.00.

I. Water and slump requirements shall conform to the requirements of this Section.

J. Cement and admixtures shall conform to the requirements of this Section.

K. Field Control: Concrete samples for slump per ASTM C 143 and test cylinders per ASTM C 31 and C 39.

3.06 TREATMENT OF SURFACE DEFECTS

A. As soon as forms are removed, all exposed surfaces shall be carefully examined and any irregularities shall be immediately rubbed or ground in a satisfactory manner in order to secure a smooth, uniform, and continuous surface. Plastering or coating of surfaces to be smoothed will not be permitted. No repairs shall be made until after inspection by the ENGINEER. In no case will extensive patching of honeycombed concrete be permitted. Concrete containing minor voids, holes, honeycombing, or similar depression defects shall have them repaired as specified herein. Concrete containing extensive voids, holes, honeycombing, or similar depression defects, shall be completely removed and replaced.

1. All repairs and replacements herein specified shall be promptly executed by the CONTRACTOR at its own expense.

B. Defective surfaces to be repaired shall be cut back from trueline a minimum depth of 1/2-inch over the entire area. Feathered edges will not be permitted. Where chipping or

cutting tools are not required in order to deepen the area properly, the surface shall be prepared for bonding by the removal of all laitance or soft material, and not less than 1/32-inch depth of the surface film from all hard portions, by means of an efficient sandblast. After cutting and sandblasting, the surface shall be wetted sufficiently in advance of shooting with shotcrete or with cement mortar so that while the repair material is being applied, the surfaces under repair will remain moist, but not so wet as to overcome the suction upon which a good bond depends. The material used for repair purposes shall consist of a mixture of one sack of cement to 3 cubic feet of sand. For exposed walls, the cement shall contain such a proportion of Atlas white portland cement as is required to make the color of the patch match the color of the surrounding concrete.

C. Holes left by tie-rod cones shall be reamed so as to leave the surfaces of the holes clean and rough. These holes then shall be repaired in an approved manner with non-shrink grout. Holes left by form-tying devices having a rectangular cross-section, and other imperfections having a depth greater than their least surface dimension, shall not be reamed but shall be repaired in an approved manner with non-shrink grout.

D. All repairs shall be built up and shaped in such a manner that the completed work will conform to the requirements of this Section, as applicable, using approved methods which will not disturb the bond, cause sagging, or cause horizontal fractures. Surfaces of said repairs shall receive the same kind and amount of curing treatment as required for the concrete in the repaired section.

E. Prior to filling any structure with water, all cracks that may have developed shall be repaired to the satisfaction of the ENGINEER. This repair method shall be done on the water bearing face of members. Prior to backfilling, faces of members in contact with fill, which are not covered with a waterproofing membrane, shall also have cracks repaired as specified herein.

F. The finished surface shall be free from humps, sags, blemishes or other irregularities.

3.07 FIELD QUALITY CONTROL

A. Correction of Mix Design for Failed Concrete Tests: If the compressive cylinder strength test for in place PCC yields test results below the specified 28-day PCC compressive strength and the Engineer determines a corrective change is necessary, the Contractor shall, at its own expense, make corrective changes in the mix proportions. The Engineer shall approve the changes in the mix proportions or PCC placement procedures, before any additional PCC is placed on the job.

B. Flood Tests: BEFORE ACCEPTANCE, ALL NEW CONCRETE SHALL BE WATER TESTED TO ENSURE PROPER DRAINAGE AS DIRECTED BY THE INSPECTOR. THE CONTRACTOR SHALL PROVIDE WATER FOR THIS PURPOSE. THE FLOODING SHALL BE DONE BY WATER TANK TRUCK. DEPRESSIONS WHERE THE WATER PONDS TO A DEPTH OF MORE THAN 0.01 FOOT SHALL BE FILLED OR THE SLOPE CORRECTED TO PROVIDE PROPER DRAINAGE. THE EDGES OF THE FILL SHALL BE FEATHERED AND SMOOTHED SO THAT THE JOINT

BETWEEN THE FILL AND THE ORIGINAL SURFACE IS INVISIBLE. PRACTICAL FIELD MEASUREMENT: 0.01 FOOT = TWO QUARTERS STACKED. NO STANDING WATER SHALL REMAIN AFTER 60 MINUTES ON A 70 DEGREE F (OR WARMER) DAY.

3.08 CARE AND REPAIR OF CONCRETE

A. General: The CONTRACTOR shall protect all concrete against injury or damage from excessive heat, lack of moisture, overstress, or any other cause until final acceptance by the Owner. Particular care shall be taken to prevent the drying of concrete and to avoid roughening or otherwise damaging the surface. Any concrete found to be damaged, or which may have been originally defective, or which becomes defective at any time prior to the final acceptance of the completed work, or which departs from the established line or grade, or which, for any other reason, does not conform to the requirements of the Contract Documents, shall be satisfactorily repaired or removed and replaced with acceptable concrete at the CONTRACTOR'S expense.

B. The contractor shall barricade and protect placed Portland Cement Concrete from all damage, marks, mars and/or graffiti. Any Portland Cement Concrete damaged, defaced, discolored or defective shall be replaced at the contractor’s expense.

END OF SECTION

SECTION 32 17 23
PAVEMENT MARKINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Painted pavement markings.
   1. Accessible Parking Spaces.
   2. Playground markings.

1.02 RELATED REQUIREMENTS

A. Section 32 12 16 - Asphalt Paving.

B. Section 32 13 13 - Concrete Paving.

1.03 REFERENCE STANDARDS

A. AASHTO M 247 - Standard Specification for Glass Beads Used in Pavement Markings.

B. AASHTO MP 24 - Standard Specification for Waterborne White and Yellow Traffic Paints.

C. ADA Standards - 2010 ADA Standards for Accessible Design.

D. ASTM D471 - Standard Test Method for Rubber Property--Effect of Liquids.

E. ASTM D522/D522M - Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings.

F. ASTM D2369 - Standard Test Method for Volatile Content of Coatings.

G. ASTM D2486 - Standard Test Methods for Scrub Resistance of Wall Paints.

H. ASTM D4060 - Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser.

I. ASTM D4541 - Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers.

J. ASTM D5895 - Standard Test Methods for Evaluating Drying or Curing During Film Formation of Organic Coatings Using Mechanical Recorders.

K. ASTM E303 - Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester.

L. CBC Chapter 11B - California Building Code-Chapter 11B.

M. FS TT-B-1325 - Beads (Glass Spheres) Retro-Reflective.

N. FS TT-P-1952 - Paint, Traffic and Airfield Marking, Waterborne.

O. SAE AMS-STD-595A - Colors Used in Government Procurement.

P. SCAQMD 1113 - Architectural Coatings.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate the work of this section with adjoining work.

B. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by affected installers.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Manufacturer's data sheets on each product to be used.

C. Certificates: Submit for each batch stating compliance with specified requirements.

1. Painted pavement markings.

D. Manufacturer's Instructions:

1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.

E. Manufacturer's qualification statement.

F. Installer's qualification statement.

G. Maintenance Materials: Furnish the following for District's use in maintenance of project.

1. See Section 01 60 00 - Product Requirements for additional provisions.
2. Extra Paint: 2 containers, 1 gallon size, of each type and color.
3. Extra Markers: 5 percent, of each type and color.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver paint in containers of at least 5 gallons accompanied by batch certificate.

B. Deliver glass beads in containers suitable for handling and strong enough to prevent loss during shipment, accompanied by batch certificate.

C. Store products in manufacturer's unopened packaging until ready for installation.

D. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.08 FIELD CONDITIONS

A. Do not install products under environmental conditions outside manufacturer's absolute limits.

B. Do not apply paint if temperature of surface to be painted or the atmosphere is less than 50 degrees F or more than 95 degrees F.

1. Do not apply marking paint when weather is foggy or rainy, or when such conditions are anticipated within eight hours of application.

2. Do not apply marking paint when wind velocity causes uncontrollable overspray or excessively rapid drying.

C. Sequence and Schedule: Apply pavement markings after asphaltic concrete and portland cement concrete and interlocking concrete paving Work are complete and properly cured and, if applicable, sealer has been applied to asphaltic concrete and landscaping Work is complete.

1. Allow new pavement surfaces to cure for a period of not less than 14 days before application of marking materials.

1.09 SEQUENCING

A. Allow new pavement surfaces to cure for a period of not less than 14 days before application of markings.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS:

A. Comply with CalGreen requirements.

1. Comply at time of installation with Air Quality standards of:

a. South Coast Air Quality Management District, SCAQMD 1113.

b. California Air Resources Board (CARB).

B. For accessibility markings see Part 3 Article "Installation".

C. Conform to State of California, Department of Transportation (CALTRANS) Standard Specifications, Section 84, Traffic Control Markings, as amended and adopted by authorities having jurisdiction.

D. Where reference is made to Standard Specifications, the following shall apply.

1. Perform off-site Work in public rights-of-way in accordance with requirements of authorities having jurisdiction. For conditions not indicated otherwise on Contract Drawings, conform to Standard Details adopted by authorities having jurisdiction, including SSPWC Greenbook.

2. Perform on-site Work as indicated and referenced on the Contract Drawings and as specified herein.

2.02 MANUFACTURERS

A. Painted Pavement Markings: FS TT-P-1952 Type II.

1. Behr: www.behr.com.

2. Dunn-Edwards Corporation; Vin-L-Stripe Specialty Interior/Exterior Flat Zone Marking Paint.

3. PPG Traffic Solutions; Ennis Flint Fast Dry Waterborne Traffic Paint, 9852x Series.

4. Sherwin Williams: www.sherwin.com.

5. Vista Paint Corporation; 6700 100% Acrylic Traffic Marking Paint: www.vistapaint.com.

6. Substitutions: See Section 01 60 00 - Product Requirements.

2.03 PAINTED PAVEMENT MARKINGS

A. General: Provide standard factory-mixed, quick drying and non-bleeding colors, conforming to Standard Specifications, as amended and adopted by the AHJ, City, and County, as applicable.

B. Painted Pavement Markings: As indicated on drawings.

1. Marking Paint: In accordance with AASHTO MP 24 or FS TT-P-1952; water emulsion-based traffic paint.

a. Parking Lots: Color(s) as indicated.

1) Fast-dry type. If required by authorities having jurisdiction for Work in public rights-of-way, include reflective material in paint. Paint for marking curbs shall not require reflective material. See Color Schedule in Part 3.

b. Symbols and Text: Color(s) as indicated.

1) Accessibility Symbols: Provide blue and white, per CBC Chapter 11B-503 and CBC Chapter 11B-703.7.2.

(a) Blue shall conform to Color No. FS 15090 in Federal Standard 595C, per CBC Ch. 11B-703.7.2. (now published as SAE AMS-STD-595A).

2. Recreational Area Paint:

3. Reflective Glass Beads at Accessible Parking Spaces: Type 1 (low index of refraction), Gradation A (coarse, drop-on); with silicone or other suitable waterproofing coating to ensure free flow, in accordance with AASHTO MP 24 or FS TT-P-1952.

a. Comply with CBC Chapter 11B-502.6.4 Marking.

4. Comply with CALTRANS State Specification No. 8010-51J-22, Type II, and CBC Chapter 11B-502.6 Identification.

C. Epoxy Painted Pavement Markings: As indicated on drawings.

1. Basis of Design Product: SB120 as manufactured by Streetbond, or approved equal.

2. StreetBond® SB120 is a two-part, premium epoxy-modified acrylic, waterborne coating specifically designed for application on pavements. It has a balance of properties to ensure good adhesion and movement on flexible pavement, while providing good durability. StreetBond® SB120 is durable in both dry and wet environments.

3. StreetBond® Colorant is a highly concentrated, high quality, UV stable pigment blend designed to add color to StreetBond® SB120 coatings. One unit of Colorant shall be used with one pail of StreetBond® coating material.

4. Properties of StreetBond® coatings

a. The following tables outline the test results for physical and performance properties of the StreetBond® coatings as determined by an independent testing laboratory.

b. Physical Properties of StreetBond® SB120 Coatings

1) Solids by Volume, ASTM D2697: 54 - 61%

2) Solids by Weight, ASTM D2369: 71.5 - 77.5%

5. Typical Performance Properties of StreetBond® SB120 Coatings

a. Characteristic Test Specification SB120 range.

b. Dry time (To re-coat) ASTM D5895 @23°C; 37% RH: 40 - 60 min.

c. Taber Wear Abrasion Dry H-10 wheel ASTM D4060, 7 day cure: 0.33 - 1.0 g/1000 cycles.

d. Taber Wear Abrasion Wet H-10 wheel ASTM D4060 modified 7 day cure: 1.8 - 4.0 g/1000 cycles.

e. Hydrophobicity Water Absorption (670 hr, 23C) ASTM D471: 3.5 - 6.5%.

f. Mandrel Bend ASTM D522/D522M - 93A: 1.0" - 1.5".

g. VOC per SDS: <50 g/liter.

h. Adhesion ASTM D4541: 300 - 1800 psi. (or cohesive asphalt failure before adhesion failure).

i. Friction Wet & Dry ASTM E303 (British Pendulum Tester)

1) Dry 75 – 95

2) Wet 55 - 75

3) NB Friction is affected by the texture of the substrate.

j. MEK scrubs 5,000 cycles ASTM D2486 D2486 (modified): Pass.

6. Equipment for StreetBond Application:

a. The SB Flex Sprayer is a proprietary coating sprayer supplied by Intech Equipment and is capable of applying the StreetBond® coatings to the asphalt pavement surface in a thin, controlled film which will optimize the drying and curing time of the coating. A Graco RTX and RapidSprayerII sprayer may also be used.

b. The StreetBond® Coatings Mixer is a motorized mixing device designed to ensure efficient and thorough blending of the StreetBond® components.

c. Backpack or Hand - Held sprayer to apply the diluted StreetBond® Adhesion Promoter Concentrate.

d. The RapidFinisher II is an electric powered broom produced by HUB Surfaces Systems which can be used in the application of StreetBond® coatings to improve productivity. It is especially useful on larger projects.

D. Temporary Marking Tape: Preformed, reflective, pressure sensitive adhesive tape in color(s) required; Contractor is responsible for selection of material of sufficient durability as to perform satisfactorily during period for which its use is required.

PART 3 EXECUTION

3.01 APPLICATORS

A. StreetBond® coating shall be supplied and applied by a Certified StreetBond® Applicator with appropriate certification on non-textured and stamped asphalt surfaces if stamped asphalt is included in the project, in accordance with the plans and specifications or as directed by the Owner. Do not begin installation without confirmation of appropriate Accreditation Certificate(s). Specifications for the execution of the StreetPrint® system can be found at streetbond.com.

3.02 EXAMINATION

A. Verification of Conditions: Verify that pavement is dry and ready for installation.

B. Notify Architect of unsatisfactory conditions before proceeding.

3.03 PREPARATION

A. Establish survey control points for locating and dimensioning of markings.

1. Lay out markings as shown on Drawings. Use guide lines, templates and forms for precise edges and spacings.

a. At off-site and on-site public rights-of-way, obtain review and approval of layout by authorities having jurisdiction.

B. Pavement markings may be removed by sandblasting, water - blasting, grinding, or other approved mechanical methods. The removal methods should, to the fullest extent possible, cause no significant damage to the pavement surface.

C. Clean surfaces prior to installation.

1. Remove dust, dirt, and other debris.

2. Remove rubber deposits, existing paint markings, and other coatings.

D. Temporary Markings: Apply as directed by Architect.

E. Apply paint stencils by type and color at necessary intervals.

3.04 INSTALLATION

A. Regulatory Accessibility Requirements for Installation:

1. Pavement markings for accessibility requirements shall meet requirements of California Building Code (CBC), Title 24, Part 2, CBC Section 11B and ADA Standards, per latest amendments.

a. Accessible parking spaces serving a particular building or facility shall be located on the shortest accessible route to an entrance complying with CBC Section 11B-208.3.1.

b. Accessible parking spaces serving more than one accessible entrance shall be dispersed and located on the shortest accessible route to the accessible entrances.

c. Accessible parking spaces in a parking facility not serving a particular building or facility shall be located on the shortest accessible route to an accessible pedestrian entrance of the parking facility. CBC Section 11B-208.3.1

d. Minimum number of required accessible parking spaces shall be provided in accordance with CBC Section 11B Table-208.2 for each parking facility provided on a site.

e. For every six or fraction of six accessible parking spaces, at least one shall be an accessible van parking space. CBC Section 11B-208.2.4

f. Accessible parking spaces and access aisles shall comply with CBC Section 11B-502 and shall be dimensioned to the centerline of the marked lines as follows:

1) Parking spaces and access aisles shall be marked according to CBC Chapter 11B Figures 11B-502.2, 11B-502.3, and 11B-502.3.3.

(a) Their surfaces shall comply with CBC Section 11B-302 and shall be at the same level with slopes not steeper than 1:48 in any direction. CBC Section 11B-502.4.

2) Parking spaces shall be 9 x 18 feet minimum and van parking spaces shall be 12 x 18 feet minimum with an adjacent access aisle of 5 x 18 feet minimum.
   (a) Access aisles shall be placed on either side of the parking spaces except be located on the passenger side for van parking spaces.
   (b) Van parking spaces shall be permitted to be 9 x 18 feet minimum where the access aisle is 8 x 18 feet minimum.

3) Access aisles shall be marked by a blue painted borderline around their perimeter.
   (a) The area within the blue borderlines shall be marked with hatched lines a maximum of 36 inches on center in a color contrasting with that of the aisle surface, preferably blue or white.
   (b) Access aisle markings may extend beyond the minimum required length. CBC Section 11B-502.3.3
   (c) At drive aisle provide minimum 12 inch high white letters with the text "NO PARKING" per CBC Section 11B Figure 11B-502.3.3.

4) Access aisles (parking spaces as well- similar application) shall not overlap the vehicular way. CBC Section 11B-502.3.4

5) A vertical clearance of 98 inches minimum shall be provided for accessible parking spaces, access aisles, and vehicular routes serving them. CBC Section 11B-502.5

B. General:
   1. Position pavement markings as indicated on drawings.
   2. Field location adjustments require approval of Architect.

C. Painted Pavement Markings:
   1. Apply in accordance with manufacturer's instructions.
   2. SB120 Coating Application Guidelines
      a. The Applicator shall use the SB Flex Spray System or suitable texture coatings sprayers to apply the StreetBond® coatings.
      b. The asphalt pavement surface shall be completely dry and thoroughly cleaned prior to application of the coatings.
      c. The coating application shall proceed as soon as practical upon completion of the imprinting of the asphalt pavement where applicable.
      d. For polished asphalt, StreetBond® Adhesion Promoter should be applied directly to the asphalt and allowed to dry completely prior to the first layers of coating.
      e. For concrete surfaces, StreetBond® WB Concrete Primer or StreetBond® QS Concrete Primer should be applied and allowed to cure prior to the first layers of coating. Please consult Technical Data sheets for more details on applications.

f. The first layer of coating shall be spray applied then broomed to work the coating material into the pavement surface. Subsequent applications shall be sprayed then broomed or rolled. Each application of coating material shall be allowed to dry to the touch before applying the next layer.

g. The Applicator shall apply the StreetBond® coatings only when the air temperature is 50°F / (10°C) and rising and will not drop below 50°F / (10°C) within 24 hours. No precipitation should be expected within 24 hours.

3. Coating Coverage & Thickness:

	COVERAGE (approx.)		**THICKNESS (approx. theoretical average)**			
# of Layers	Non-Textured		Wet		Dry	
	sqft/unit*	sqm/unit*	mm	mil	mm	mil
3	200	18.6	0.84	33	0.48	19
4	150	13.9	1.12	44	0.66	26
5	120	11.2	1.40	55	0.81	32
6	100	9.3	1.68	66	0.97	38

*1 unit is a nominal 5 gallon pail comprising Part A, Part B and Colorant (approximately 4.12 gallons). 1 unit when sprayed as a single layer covers approximately 600 sqft (55.7 sqm), with an approximate thickness of 6.3 mil (0.16mm) dry.

4. Recommended Coating Coverage Rates

Application	**Hot Dry Climate**	**Temperate/Winter Climate**
Pedestrian only	3 layers at 600 ft2 (56m2) per 5 gallon (20 Litre) unit for a net coverage of 200 ft2 (18.6m2) per 5 gallon (20 Litre) unit	3 layers at 600 ft2 (56m2) per 5 gallon (20 Litre) unit for a net coverage of 200 ft2 (18.6m2) per 5 gallon (20 Litre) unit

5. Marking Paint: Apply uniformly, with sharp edges.
   a. Applications: One coat.
   b. Wet Film Thickness: 0.015 inch, minimum.
   c. Stencils: Lay flat against pavement, align with striping, remove after application.
   d. Glass Beads: Apply directly to paint, 10 second lag time, 6 lbs/gal of paint, uniform thickness and coverage.
   e. Length Tolerance: Plus or minus 3 inches.
   f. Width Tolerance: Plus or minus 1/8 inch.
6. Curbs: Paint full vertical face and first 6-inches of horizontal plane at top of curb or combination curb/paving. Provide minimum 2 coats paint.
   a. Provide stenciled text in the height, spacing and typeface as indicated on Drawings.
7. Parking Lots: Apply parking space lines, entrance and exit arrows, painted curbs, and other markings indicated on drawings.
   a. Mark the International Symbol of Accessibility at indicated parking spaces.

1) Accessibility Logo: Provide minimum of 2 coats paint.
   (a) Comply with CBC Chapter 11B Figure 703.7.2.1.
2) Stall Marking:
   (a) Use single-line style striping between parking stalls, unless otherwise indicated.
   (b) Comply with local agency regulatory requirements.
   (c) Accessible Stalls: Comply with ADA Standards, CBC Chapter 11B, and Division of the State Architect regulatory requirements.
      (1) Painted lines and markings on pavement shall be minimum 3 inches wide, color as indicated on Drawings
3) Hatching: Provide hatching in parking areas, including accessible parking stalls, as indicated on Contract Drawings or as required by Standard Details. Should Contract Drawings and Standard Details conflict, comply with the more stringent.

b. Hand application by pneumatic spray is acceptable.

8. Symbols: Use a suitable template that will provide a pavement marking with true, sharp edges and ends, of the design and size indicated.
9. Recreational Areas: Provide minimum 2 coats paint.

3.05 TOLERANCES

A. Maximum Variation From True Position: 3 inches (76 mm).
B. Maximum Offset From True Alignment: 3 inches (76 mm).

3.06 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements for additional requirements.
B. Perform field inspection for deviations from true alignment or material irregularities.
C. If inspections indicate work does not meet specified requirements, rework and reinspect at no cost to District.
D. Allow the pavement marking to set at least the minimum time recommended by manufacturer.

3.07 CLOSEOUT ACTIVITIES

A. See Section 01 78 00 - Closeout Submittals for additional requirements.
B. Temporary Markings: Remove without damaging surfaces.

3.08 PROTECTION

A. Replace damaged or removed markings at no additional cost to District.
B. Preserve survey control points until pavement marking acceptance.

END OF SECTION

SECTION 32 18 13
SYNTHETIC GRASS SURFACING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Synthetic grass surfacing and infill.

B. Edge anchoring and borders.

C. Shock absorbing course.

D. Correction of grades and subgrade.

E. Drainage layer.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete.

B. Section 31 20 00 - Earthwork.

C. Section 31 10 00 - Site Clearing.

D. Section 32 11 20 - Subbase and Aggregate Base Courses.

1.03 REFERENCE STANDARDS

A. ASTM C136/C136M - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

B. ASTM C920 - Standard Specification for Elastomeric Joint Sealants.

C. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)).

D. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).

E. ASTM D6662 - Standard Specification for Polyolefin-Based Plastic Lumber Decking Boards.

F. ASTM F1292 - Standard Specification for Impact Attenuation of Surfacing Materials Within the Use Zone of Playground Equipment.

G. ASTM F1487 - Standard Consumer Safety Performance Specification for Playground Equipment for Public Use.

H. ASTM F1667 - Standard Specification for Driven Fasteners: Nails, Spikes, and Staples.

I. ASTM F1936 - Standard Specification for Impact Attenuation of Turf Playing Systems as Measured in the Field.

J. ASTM F2898 - Standard Test Method for Permeability of Synthetic Turf Sports Field Base Stone and Surface System by Non-confined Area Flood Test Method.

K. ASTM STP322-1 - Field Testing of Soils, Chapter 1: Field Percolation Tests for Sanitary Engineering Application.

L. CPSC Pub. No. 325 - Public Playground Safety Handbook.

1.04 ADMINISTRATIVE REQUIREMENTS

A. See Section 01 30 00 - Administrative Requirements - Administrative Requirements, for project meetings.

B. Preinstallation Meeting: Conduct a preinstallation meeting at least one week prior to the start of the work of this section; require attendance by all affected installers.

C. Sequencing: Ensure that utility connections are achieved in an orderly and expeditious manner.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: For all manufactured surfacing products, provide manufacturer's product data showing materials of construction, compliance with specified standards, installation procedures, and safety limitations.

1. Include STC and IPEMA certifications where required.
2. Treated Wood Products: Provide information on wood treatment chemical content, toxicity level, and life-cycle durability.

C. Shop Drawings, Carpet Roll: Show locations of seams and methods of seaming.

D. Samples: For each product for which color must be selected provide color chart showing full range of colors.

E. Samples: Provide following prior to ordering material:

1. Synthetic Grass carpet: Two 12 inch by 12 inch (305 mm by 305 mm) pieces.
2. Infill material: Two 1-gallon bags for each type.
3. Seamed synthetic grass carpet: Two 12 inch by 24 inch (305 mm by 610 mm) pieces seemed together for each seaming method indicated on drawings.
4. Shock absorbing material: Two 1-gallon bags for each type.

F. Percolation Test Report: Describing test method used and results.

G. Manufacturer's Qualification Statement.

H. Installer's Qualification Statement.

I. Maintenance Data:

1. For manufactured surfacing products, provide manufacturer's recommended maintenance instructions and list of repair products, with address and phone number of source of supply.
2. For loose fill surfacing products, provide detailed re-ordering information to enable District to match installed material exactly.

J. Manufacturer's Field Report.

K. Topographical survey of loose fill layer prior to installation of synthetic grass carpet.

L. Certification: Provide IPEMA certification of ASTM F1292 Critical Fall Height at thickness specified.

1.06 QUALITY ASSURANCE

A. See section 01 40 00 - Quality Requirements, for procedures for testing, inspection, mock-ups, reports, certificates, use of reference standards.

B. Maintain one copy of latest edition of ASTM F1487 and CPSC Pub. No. 325 at project site.

C. Manufacturer Qualifications: Company regularly engaged in manufacturing products specified in this section, with not less than three years of documented experience.

1. Surfacing installed in minimum 10 sites and been in successful service minimum 5 years.

2. Manufacturer's Representative: Provide name, company name and address, and qualifications.

D. Installer Qualifications: Company certified by manufacturer for training and experience installing protective surfacing; provide installer's company name and address, and training and experience certificate.

1. Installers of the subsurface drainage base system for the fields shall be required to comply with and supply proof/references to the District 10 days prior to the bid the following information:

a. General Contractor constructing the drainage base system must have an installation team possessing a Class A California Engineering Contractor’s License.

b. Have prior direct experience in preparing a minimum of 10 drainage base sub-surface systems for synthetic turf sports fields as is proposed for this project and must have installed a minimum of 10 synthetic turf field projects the past 3 years in California.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver, handle, and store synthetic grass surfacing to project site in accordance with manufacturer's recommendations.

B. Store materials in dry, covered area, elevated above grade.

1.08 FIELD CONDITIONS

A. Ambient Conditions: Cease work of this section when:

1. Temperatures are below 55 degrees F.

2. Humidity levels are above adhesive manufacturer's requirements.

3. Rain is imminent or falling.

4. Surfaces are wet or damp.

1.09 WARRANTY

A. See Section 01 78 00 - Closeout Submittals - Closeout Submittals, for additional warranty requirements.

B. Warranty:

1. Submit Manufacturer Warranty and ensure that forms have been completed in District's name and registered with Manufacturer and Insurance Carrier. Submit information confirming that 3rd Party Insurance Policy, non-cancelable and pre-paid, is in effect covering this installation, and underwritten by a Best "A+" Rated Insurance Carrier. Insurance carrier must confirm that the policy is in force and premiums paid. The manufacturer's warranty shall include general wear and damage caused from UV degradation.
2. The warranty shall specifically exclude vandalism and Acts of God beyond the control of the District or the manufacturer.
3. The turf contractor shall provide a warranty to the District that covers defects in the installation workmanship, and further warrant that the installation was done in accordance with both the manufacturer's recommendations and any written directives of the manufacturer's on-site representative.
4. All turf warranties shall be NON PRORATED and limited to repair or replacement of the affected areas, at the option of the manufacturer, and shall include all necessary materials, labor, transportation costs, etc. to complete said repairs. All warranties are contingent on the full payment by the District of all pertinent invoices.
5. Turf must maintain an ASTM F355 G-max of less than 175G for the life of the warranty.
6. If a synthetic base drainage system is utilized, the manufacturer of that product must warranty their system for the repair and or replacement of the turf in the event that the synthetic base fails.

C. Warranty Testing:
1. Test the turf for the field for dynamic cushioning ("GTest) by an experienced independent testing laboratory acceptable to the District at the completion of the installation, shortly prior to acceptance inspection by the District.
2. Test also at the anniversary date of the first year, second year, fourth year, sixth year, and 60 days prior to the anniversary date of the warranty expiration.
    a. If conditions of the Specifications and/or Warranty are not met, the Contractor has the option of corrective work or replacement.
    b. In the event corrective work does not meet the requirements of the Specifications after a second attempt to bring the system within these limits, then the Contractor is to replace non-conforming areas or sections solely at the District's discretion and direction.
3. Tests shall be performed in accordance with ASTM F1936 and ASTM F355.
    a. Test locations as designated in ASTM F1936, Paragraph 8.1. Included in the report shall be the measured depth of the infill material at all test locations.
    b. All costs for the stated testing shall be paid by the Synthetic Turf Surfacing Contractor.
    c. If the Contractor does not have the tests performed within 10 days of specified times listed, the District has the option of ordering the testing work at the expense of the Synthetic Turf Surfacing Contractor.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

A. Provide surfacing meeting the requirements for the physically disabled of the California Code of Regulations (CCR), Title 24, Part 2, and ADA Accessibility Guidelines for Buildings and Facilities, as amended.

1. Surfacing shall be stable, firm, and slip resistant and shall comply with CBC Sections 11B-302 and 11B-403.
2. Surfacing shall have accessible points of entry and use.

2.02 SYNTHETIC GRASS SURFACING

A. District StandardProduct: ECO 82 as manufactured by Turf Distributors.

B. Synthetic Grass Infill: 3 pounds per square foot (15 ksm), minimum at 50-50 percent granule to synthetic sand: Total amount as required for performance.

1. Sand: Silica, 20-30 mesh, free of silts, clays, and contaminants, roundness of subangular, minimum, per ASTM F1632.
   a. Average Particle shape > 0.4 on the Krumbein scale.
   b. Particle structure predominantly single grain.
   c. Produce < 0.4%, -50M in API crush test at 80 psig.

C. Meet California's Prop 65. Ensure the material has been tested to key local standards.

D. Shock Absorbing Course:

1. The dynamic cushioning of the system shall not exceed a maximum value of 130 G's per ASTM F1936 and ASTM F355, procedure A at any location upon installation.
2. Impact Mats, In Situ Cushion: Shredded rubber bonded with polyurethane adhesive, designed to allow water penetration, installed over aggregate subbase.
   a. Rubber: 100 percent recycled shredded styrene butadiene rubber (SBR) shreds or granules.

2.03 MATERIALS

A. Edge Anchoring: Wood-polymer composite lumber complying with ASTM D6662; factory finished, free of sharp vertical edges, protruding elements, and trip hazards, capable of being secured to border.

1. Size(s): 2 inch by 3 inch (51 mm by 76mm).
2. Minimum Edge Radius: 1/2 inch.

B. Border: Permanent element surrounding edge anchoring, consisting of exterior walls:

1. Sidewalks: As indicated on drawings.
2. Chain Link Fence: As indicated on drawings.

C. Total thickness of the base stone and fill surfacing: 6 inches.

1. Drainage Fill (Loose Surfacing): 2 inches.
2. Base Stone: 4 inches.

D. Drainage (Loose Surfacing) Course: Fractured, non-rounded gravel; washed; free of dust, clay, dirt, organic material, hazardous substances, or foreign objects; rounded particles, either naturally or mechanically; sieved in compliance with ASTM C136/C136M in specified gradation range.
   1. Percent Passing Sieve Size 1/2 inch: 100 percent.
   2. Percent Passing Sieve Size 3/8 inch: 75 to 85 percent.
   3. Percent Passing Sieve Size No. 4: 30 to 60 percent.
   4. Depth: As indicated on drawings.

E. Drainage (Base Stone) Course: Fractured, non-rounded gravel; washed; free of dust, clay, dirt, organic material, hazardous substances, or foreign objects; rounded particles, either naturally or mechanically; sieved in compliance with ASTM C136/C136M in specified gradation range.
   1. See Section 32 11 20 - Subbase and Aggregate Base Courses.
   2. Depth: As indicated on drawings.

F. Drainage Pipes: Uniform material, free of defects:
   1. Material: As indicated on drawings.
   2. Shape: As indicated on drawings.
   3. Perforations: As indicated on drawings.
   4. Size: As indicated on drawings.

2.04 ACCESSORIES

A. Fasteners, Synthetic Grass to Edging: 1/2 inch (13 mm) stainless steel staples, in compliance with ASTM F1667.

B. Fasteners, Edging to Border: Self drilling, stainless steel screws, in compliance with ASTM F1667.

C. Fasteners, Seams:
   1. Sewing Thread: As recommended by manufacturer.
   2. Bonding:
      a. Adhesive: Two-part urethane-based glue.
      b. Backing: 12-inch (305 mm) wide woven polyester.

D. Joint Sealant: As recommended by curbing manufacturer, in compliance with ASTM C920.

2.05 SOURCE QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for additional requirements.

B. Supply individual components from single source.

PART 3 EXECUTION

3.01 PREPARATION

A. Lay out entire project perimeter as indicated on drawings prior to starting work.

B. Measure location of all synthetic grass elements, including perimeter of existing synthetic grass surfacing, access and egress points, hard surfaces, walls, fences, and structures.

C. Verify location of underground utilities and facilities in project area. Damage to underground utilities and facilities will be repaired at Contractor's expense.

3.02 SUBGRADE

A. Correct irregularities to ensure that required depth of drainage layer can be installed, and elevation is in accordance with manufacturer's requirements.

B. Remove all obstructions that extend into drainage layer within composite nailer boards.

C. Perform rough and finish grading, see Section 31 20 00.

D. Shape to profile indicated on drawings and compact by proof rolling to minimum 95 percent, in compliance with ASTM D698.

E. Flatness Tolerance: 1/2 inch in 10 feet, maximum.

F. Perform percolation test at lowest elevation of subgrade, in compliance with ASTM STP322-1.

1. Report results to Architect.
2. If percolation is less than 1 inch in 3 hour period, do not proceed.

G. Verify that subgrades are at proper elevations and that smooth grading is complete.

3.03 TRENCHING AND BACKFILLING

A. Lay out trenching for entire drainage network prior to excavation, as indicated on drawings.

B. Excavate trenches in accordance with drawings.

C. Mirror base of trenches to finish grade.

D. Open trenches require presence of daily site activity.

E. Repair deviations from plans after drainage pipe installation and prior to installing geotextile.

3.04 GEOTEXTILE

A. Verify that subgrade is free of ruts or protruding objects.

B. Install geotextile over subgrade in drainage trenches first, prior to field installation.

C. Lap minimum 36 inches width at seams. Adhere seams in accordance with manufacturer's recommendations.

D. Install smooth, and free of tensile stresses, folds, or wrinkles.

E. Protect from clogging, tears, or other damage during surfacing installation.

F. Repair or replace damaged geotextile in accordance with manufacturer's recommendations.

3.05 DRAINAGE AGGREGATE

A. Loose Fill Surfacing:

1. Install in compliance with CPSC Pub. No. 325, ASTM F1487, and requirements of authorities having jurisdiction (AHJ).
2. Install aggregate subbase as indicated on drawings and in Section 32 11 20. Compact aggregate to maximum 95 percent, in accordance with ASTM D1557.

3. Compact to minimum 95 percent density, in accordance with ASTM D698.
4. Flatness Tolerance: 1/4 inch in 10 feet, maximum.
5. Correct high and low areas in accordance with design drawings.
6. Match top of layer with top of edge anchoring.
7. Prevent base stone from entering into loose fill surfacing layer. Prevent loose fill from entering into base stone layer.

B. Base Stone:
1. Install aggregate subbase as indicated on drawings and in Section 32 11 20. Compact aggregate to maximum 95 percent, in accordance with ASTM D1557.
2. Install in compliance with CPSC Pub. No. 325, ASTM F1487, and requirements of authorities having jurisdiction (AHJ).
3. Compact to minimum 95 percent density, in compliance with ASTM D698.
4. Flatness Tolerance: 1/2 inch in 10 feet, maximum.
5. Correct high and low areas in accordance with design drawings.
6. Mirror base stone elevations to final elevations.
7. Prevent disturbance to geotextile during installation.
8. Approval of drainage piping by Architect required prior to commencement of installation. Prevent disturbance of drainage piping during installation.

3.06 SHOCK ABSORBING COURSE

A. Impact Mats:
1. In Situ Cushion:
a. Mix SBR and adhesive mechanically on-site in accordance with manufacturer's directions; do not mix by hand.
b. Install in continuous bond; ensure complete bond to subbase.
c. Maintain full thickness of resilient layers within Use Zone; cover or abut containment curbs as indicated on drawings; completely cover tapered transition edges.
d. Hand trowel exposed surface to smooth, even finish.
e. Impact Attenuation Layer: Install entire layer in one continuous pour on same day.

3.07 EDGE ANCHORING

A. Layout composite nailer boards. Approval of locations by Architect required prior to installing.
B. Install along full perimeter of synthetic grass.
C. Fasten to border with case hardened screws at 24 inch on center, minimum.
D. Set top of edging flush or recessed 1/2 inch below top of border, maximum.

3.08 BORDER

A. Verify that site furnishings and composite nailer boards located within project area are complete.

B. Install border sidewalks according to design drawings.

C. Sidewalks: Match to top elevation or increase by 1/2 inch above edge anchoring, maximum. See Section 03 30 00 for cast-in-place sidewalks.

3.09 SYNTHETIC GRASS

A. Carpet Rolls:

1. Unroll all carpet in same direction.
2. Prevent seams from being located over impact mats.
3. Allow carpet to rest for at least 4 hours after unrolling and prior to seaming.
4. Smooth seams and edges, eliminate overlaps and gaps.

B. Seaming:

1. Cut: Straight, with clean and smooth edge.
2. Method: per manufacturer.
   a. Nailing / Stapling: Spaced 3 inch (76 mm) along seam.
   b. Sewing: 2 thread, bound seam stitch.
   c. Bonding: Adhesive-backed, applied uniformly with complete coverage.
   d. Micromechanical: Utilizing hook-and-loop fasteners.

C. Securing: Staple carpet to edging 1 inch (25 mm) on center.

3.10 INFILL

A. Apply during dry weather without signs of moisture on synthetic grass.

B. Thoroughly brush synthetic grass prior to infill installation.

C. Apply infill uniformly in multiple lifts, brush fibers between each application.

D. Measure depth to confirm accordance with plans.

3.11 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for additional requirements.

B. Drainage aggregate completion requires approval by Architect.

C. District or District's representative will inspect synthetic grass after installation to verify that surfacing is of proper type and meets specified design safety and accessibility requirements.

D. Repair or replace rejected work until compliant with specified requirements and design criteria.

E. Confirm rainfall permeability meets design, per ASTM F2898.

F. Confirm impact attenuation meets design, per ASTM F1936.

G. Replace damaged products before Date of Substantial Completion.

3.12 CLEANING

A. Clean surrounding areas of excess construction materials, debris, and waste.

B. Remove excess and waste material and dispose of off-site in accordance with requirements of authorities having jurisdiction.

C. See Section 01 74 19 - Construction Waste Management and Disposal, for additional requirements.

3.13 MAINTENANCE

A. Vendor shall complete maintenance of the synthetic turf field at both 6 months and 1 year after the date of Substantial Completion. Minimum maintenance activities shall include:

1. Inspect and repair as required each seam.
2. Brush and remove surface debris, loose fibers and any other deleterious material. Use of a rotating, mechanical brush is recommended.
3. Decompact and re-level infill materials. Import and place /top dress new infill material matching original infill materials as needed to establish original infill depth, with ¾" of exposed fiber.
4. All maintenance activities shall be as approved and directed by the original manufacturer.
5. All maintenance activities shall be coordinated with scheduled use of the facility and completed at the convenience of the District and applicable user groups.

3.14 MAINTENANCE & WARRANTY

A. The turf installer and/or the turf manufacturer must provide the following through the Contractor:

1. Prior to Final Acceptance, the Contractor shall submit to the District:
   a. Three (3) copies of Maintenance Manuals, which will include all necessary instructions for the proper care and preventive maintenance of the turf system, including painting and markings.
   b. Project Record Documents: Record actual locations of seams, drains or other pertinent information.

3.15 CLOSEOUT ACTIVITIES

A. See Section 01 78 00 - Closeout Submittals, for closeout submittals.

B. See Section 01 79 00 - Demonstration and Training, for additional requirements.

C. Demonstration: Demonstrate operation of system to District's personnel.

1. Use operation and maintenance data as reference during demonstration.
2. Conduct walking tour of project.
3. Briefly describe function, operation, and maintenance of each component.

D. Training: Train up to eight District's personnel on operation and maintenance of system.

1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.

2. Provide minimum of two hours of training.
3. Location: At project site.

3.16 MAINTENANCE SERVICE

A. The Turf Contractor must have a professional, full time maintenance company and service with a minimum of 20 current maintenance contracts in place.

3.17 PROTECTION

A. Protect installed products until Date of Substantial Completion.

B. Restore adjacent existing areas that have been damaged by work of this section.

END OF SECTION

SECTION 32 18 16.13
PLAYGROUND PROTECTIVE SURFACING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Protective surfacing for playground area. OFOI

B. Subbase under resilient surfacing. OFOI

C. Containment curbs.

1.02 SUMMARY

A. The District will contract with an independent vendor (Owner's Vendor) to install the playground protective surfacing and base. This section is provided for reference purposes of the SIte Contractor.

1. Aggregate base and drainage is the responsibility of the Surfacing Contractor.

B. It shall be the responsibility of the successful equipment contractor (Owner's Vendor) to provide all labor, materials, equipment and tools necessary for the complete installation of the equipment, as indicated on the plans and as specified herein. The installation of all materials shall be performed in strict accordance with the manufacturer's installation instructions and in accordance with all approved shop drawings.

C. (Owner's Vendor) to furnish all labor, materials, tools and equipment necessary to install equipment as indicated on the Drawings and as specified herein; including components and accessories required for a complete installation. including but not limited to:

1. Installation and Acceptance of prepared sub-base.
2. Coordination with related trades to ensure a complete, integrated, and timely installation
    a. Coordination with grading and compacting, piping, and drainage components; as provided under respective section(s).

D. Perimeter edge details required for the system shall be as detailed and recommended by the playground protective surfacing manufacturer, and as approved by the District.

1. Supply and installation of these details will be under the scope of work of the base contractor, not that of the playground protective surfacing Installer.

1.03 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete.

B. Section 11 68 13 - Playground Equipment: Playground layout (staking).

C. Section 32 11 20 - Subbase and Aggregate Base Courses.

1.04 REFERENCE STANDARDS

A. ASTM D2047 - Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine.

B. ASTM F1292 - Standard Specification for Impact Attenuation of Surfacing Materials Within the Use Zone of Playground Equipment.

C. ASTM F1487 - Standard Consumer Safety Performance Specification for Playground Equipment for Public Use.

D. ASTM F1951 - Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment.

E. CBC Chapter 11B - California Building Code-Chapter 11B.

F. CPSC Pub. No. 325 - Public Playground Safety Handbook.

G. DSA BU 08-07 - Use of Engineered Wood Fiber (EWF) at Play Areas.

1.05 DEFINITIONS

A. Use Zone: The area beneath and immediately adjacent to a play structure or equipment (play event) that is designated for unrestricted circulation around equipment, and on whose surface it is predicted that a user would land when falling from or exiting the equipment.

B. Critical Fall Height: The maximum fall height at which the protective surfacing meets the requirements of ASTM F1292.

C. High Play Activity Area: Areas where the fall height is especially great, such as at swings. A high play activity area is defined only where the protective surfacing of the entire playground area is not designed for the greatest fall height. High play activity areas are defined on the drawings.

D. Fall Height: The vertical distance between the finished elevation of the designated play surface and the finished elevation of the protective surfacing beneath it as defined by ASTM F1487.

E. Protective Surfacing: Resilient ground surfacing. The characteristics of the protective surfacing are based on the fall height of the playground equipment. Changes in either the surfacing or the fall height, particularly reducing the resilience of the protective surfacing or increasing the fall height, will reduce safety-related performance.

F. Subbase: A layer under the resilient layer of the protective surfacing but over the subgrade; may be rigid, as in concrete or bituminous, or aggregate.

G. Subgrade: The surface of the ground on which the protective surfacing is installed.

1.06 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements - Administrative Requirements, for submittal procedures.

B. Product Data: For all manufactured surfacing products, provide manufacturer's product data showing materials of construction, compliance with specified standards, installation procedures, and safety limitations.

1. Include IPEMA certifications where required.

    a. Provide IPEMA certification of ASTM F1292 Critical Fall Height at thickness specified.

2. Treated Wood Products: Provide information on wood treatment chemical content, toxicity level, and life-cycle durability.

C. Product Data: For natural surfacing materials, provide supplier's certification or mill certificate showing compliance with specified requirements.

D. Shop Drawings: Detailed scale drawings showing locations of existing playground equipment and exposed footings, bases, and anchorage points.

1. Clearly identify footing and base elevations in relation to a fixed survey point on site and to subgrade elevation and depth of protective surfacing, surveyed by land surveyor licensed in California.
2. Show locations of underground utilities, storm-drainage system and irrigation system.
3. Show locations of related construction such as walkways and roadways, fences, site furnishings, and plantings.
4. Show measured fall height for each playground equipment item, determined in accordance with ASTM F1487.
5. Show Use Zone perimeters, determined in accordance with ASTM F1487.

E. Samples: Provide actual material samples for engineered wood fiber.

F. Percolation Test Report: Describing test method used and results.

G. Maintenance Data:

1. For manufactured surfacing products, provide manufacturer's recommended maintenance instructions and list of repair products, with address and phone number of source of supply.

H. Manufacturer's Field Report.

1.07 QUALITY ASSURANCE

A. Maintain one copy of the latest edition of ASTM F1487 and CPSC Pub. No. 325 at project site.

B. Manufacturer Qualifications: Company regularly engaged in manufacturing products specified in this section, with not less than three years of documented experience.

1. Surfacing installed in minimum 10 sites and been in successful service minimum 5 years.
2. Provide certificate of Insurance AA rated for minimum 1,000,000 dollars covering both product and general liability.
3. Manufacturer's Representative: Provide name, company name and address, and qualifications.

C. Installer Qualifications: Company certified by manufacturer for training and experience installing the protective surfacing; provide installer's company name and address, and training and experience certificate.

1.08 PRE-INSTALLATION MEETING

A. Coordinate with Section 11 68 13.

B. Convene a meeting one week before starting earthwork for playground to discuss coordination between various installers.

1. Require attendance by personnel responsible for grading and installers of playground equipment, protective surfacing, footings, and adjacent work.

2. Include representatives of Contractor.
3. Notify Architect at least 2 weeks prior to meeting.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Deliver, handle, and store protective surfacing to project site in accordance with manufacturer's recommendations.

B. Store materials in a dry, covered area, elevated above grade.

1.10 WARRANTY

A. See Section 01 78 00 - Closeout Submittals - Closeout Submittals, for additional warranty requirements.

B. Provide minimum five year warranty for playground surfacing.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

A. Ground surfaces on accessible routes, clear floor or ground spaces, and turning spaces for play areas shall comply with CBC Chapter 11B-1008.2.6 as follows:

1. Ground surfaces shall be inspected and maintained regularly and frequently to ensure continued compliance with ASTM F1951.
2. Ground surfaces located within use zones shall comply with ASTM F1292 (1999 edition or 2004 edition)

2.02 PERFORMANCE CRITERIA

A. Because the safety of the playground depends on strict compliance with the performance criteria, this information is provided for Contractor's information.

1. The protective surfacing constitutes a resilient layer installed over a non-resilient layer, which is installed over the subgrade, with the top of playground equipment footings and anchorage devices covered by full depth of the resilient portion of the protective surfacing.
2. The top elevation of the protective surfacing is intended to be flush with adjacent grades.
   a. Comply with CBC Chapter 11B-1008.2.6.1 and ASTM F1951.
3. Use Zone: The protective surfacing has been designed to provide acceptable impact attenuation as defined in ASTM F1292 for Critical Height of 8 feet.
4. High Play Activity Area: The protective surfacing has been designed to provide impact acceptable attenuation as defined in ASTM F1292 for Critical Fall Height of 10 feet.

2.03 MATERIALS

A. Poured-In-Place Membrane Surfacing: Weather-resistant wear layer over impact attenuating substrate over aggregate subbase.

1. Wear Layer: Ethylene propylene diene monomer (EPDM) particles adhered with a ultraviolet-stabilized polyurethane binder to produce an even, uniformly colored surface.

2. Wear Layer Thickness: 1/2 inch, minimum.
3. Coefficient of Friction, when wet: 0.8, minimum, when tested in accordance with ASTM D2047.
4. Wear Layer Color(s): As indicated on drawings.
5. Impact Attenuating Substrate: 100 percent recycled shredded styrene butadiene rubber (SBR) shreds or granules with 100 percent solids polyurethane binder to form a resilient material; do not use foam rubber.
6. Resilient Depth: As required to achieve specified Critical Fall Height as defined in ASTM F1292 but not more than depth indicated; maintain top elevation flush with adjacent grades.
7. Resilient Depth - Other Than High Play Activity Area: 3-1/2 inch, minimum.
8. Certification: Provide IPEMA certification of ASTM F1292 Critical Fall Height at thickness specified.
9. Manufacturers:
    a. Basis of Design Product: SpectraPour Poured-in-Place as manufactured by SpectraTurf, www.spectraturf.com, or approved equal.
    b. Basis of Design Product: PlayBound Poured-in-Place as manufactured by Surface America, www.surfaceamerica.com, or approved equal.
    c. Robertson Recreational Surfaces: www.robertsonsurfaces.com.
    d. Surface America: www.surfaceamerica.com.
    e. Substitutions: See Section 01 60 00 - Product Requirements.
10. Accessories: Provide manufacturer's standard containment curbs and tapered transition elements to support surfacing between changes of surface grade.

B. Geotextile: Nonwoven polypropylene sheet.

C. Containment Curbs: Cast-in-place concrete; free of sharp vertical edges, protruding elements, and trip hazards.
1. Size(s): As indicated on drawings.
2. Minimum Edge Radius: 1/2 inch.

D. Aggregate Subbase: See Section 32 11 20.

PART 3 EXECUTION

3.01 EXAMINATION

A. Playground equipment installer will perform playground layout prior to installation of footings; verify correctness of layout before starting this work.

B. Verify that playground equipment and site furnishings and irrigation system located within playground area are complete.

C. Verify location of underground utilities and facilities in the playground area. Damage to underground utilities and facilities will be repaired at Contractor's expense.

D. Verify that subgrades are at proper elevations and that smooth grading is complete.

E. Verify that proper depth of surfacing is marked on base supports of playground equipment.

3.02 PREPARATION

A. Maintain all benchmarks, monuments, and other reference points. If disturbed or destroyed, replace as directed.

B. Keep adjacent streets, sidewalks, and property free of mud, dirt, or similar nuisances resulting from earthwork operations.

C. Correct subgrade irregularities to ensure that required depth of protective surfacing can be installed, and subgrade elevation is in accordance with manufacturer's requirements.

1. Provide minimum 1% downward grade to ensure proper drainage to FibarDrain Strip.
2. Excavate trench 2 inch wide x 6 inch deep, perpendicular to grade at lowest point of playground area. Install FibarDrain and connect low end of strip to storm drain or similar device to remove collected water.

D. Inside Use Zones remove all obstructions that would extend into the resilient protective surfacing.

E. Remove rocks, debris, and other similar items.

F. Install containment curbs with top surface flush with intended elevation of top surface of protective surfacing.

3.03 SUBBASE

A. Cover Subgrade with Geotextile:

1. Lap minimum 4 inches width at seams. Adhere seams in accordance with manufacturer's recommendations.
2. Install smooth, and free of tensile stresses, folds, or wrinkles.
3. Protect from clogging, tears, or other damage during surfacing installation.
4. Repair or replace damaged geotextile in accordance with manufacturer's recommendations.

B. Stone base course must be surrounded by a retaining curb.

C. Maintain porosity for direct drainage.

D. Install aggregate subbase as indicated on drawings. Compact aggregate to maximum 95 percent, in accordance with ASTM D1557.

1. Sub-Base Requirements: Base to have the specific minimum slope (2%) and vary no more than 1/8 inch when measured in any direction with a 10 foot straight edge.

E. Install with top surface of subbase no higher than grades and levels indicated and not more than 1/4 inch lower than grades and levels indicated.

F. Install in true, even plane, sloped to provide positive drainage.

G. Flatness Tolerance: 1/4 inch in 10 feet, maximum.

H. Cure subbase at least 7 days but not less than required by manufacturer of resilient surfacing.

3.04 RESILIENT SURFACING LAYER

A. Install in accordance with CPSC Pub. No. 325, ASTM F1487, manufacturer's instructions, and requirements of authorities having jurisdiction (AHJ).

B. Install proper thickness throughout Use Zone(s).

C. Clean and dry surface of subbase.

D. Cover aggregate subbase with geotextile:

1. Verify that aggregate is free of ruts or protruding objects.
2. Lap minimum 4 inches width at seams. Adhere seams in accordance with manufacturer's recommendations.
3. Install smooth, and free of tensile stresses, folds, or wrinkles.
4. Protect from clogging, tears, or other damage during surfacing installation.
5. Repair or replace damaged geotextile in accordance with manufacturer's recommendations.

E. Poured In Place Surfacing:

1. Mix components mechanically on-site in accordance with manufacturer's directions; do not mix by hand.
2. Install seamlessly; ensure complete bond to subbase.
3. Cover footings and foundations and adhere tightly around penetrating elements.
4. Maintain full thickness of resilient layers within Use Zone; cover or abut containment curbs as indicated on drawings; completely cover tapered transition edges.
5. Hand trowel exposed surface to smooth, even finish.
6. Impact Attenuation Layer: Install entire layer in one continuous pour on the same day.
7. Wear Surface: Bond wear surface to substrate with adhesive. Apply adhesive in small quantities so that wear surface can be applied before adhesive dries.
    a. Install surfacing seamlessly. When wear surface is composed of different color patterns, pour surface continuously and seamlessly.
    b. When seams are required due to color change or field conditions, place adjacent wear surface as soon as possible, before initial pour has cured. Coat edge of initial pour with adhesive and apply wear surface mixture immediately.
    c. Add a minimum of 1/16 inch depth to specified surfacing depth to ensure required impact attenuation performance is met.
    d. Install wear surface to cover foundations and adhere tightly around elements penetrating the surface.

3.05 FIELD QUALITY CONTROL

A. Obtain the services of the equipment manufacturer's field representative to review the finished installation for compliance with specified requirements and with design criteria to the extent known to the Contractor; submit report of field review.

B. District or District's representative will inspect playground surfacing after installation to verify that surfacing is of proper type and depth and that playground meets specified design safety and accessibility requirements.

C. Repair or replace rejected work until compliance is achieved.

3.06 CLEANING AND PROTECTION

A. Restore adjacent existing areas that have been damaged from the construction.

B. Clean playground equipment of construction materials, dirt, stains, filings, and blemishes due to shipment or installation. Clean in accordance with manufacturer's instructions, using cleaning agents as recommended by manufacturer.

C. Clean playground area of excess construction materials, debris, and waste.

D. Remove excess and waste material and dispose of off-site in accordance with requirements of authorities having jurisdiction.

E. Protect installed products until Date of Substantial Completion.

F. Replace damaged products before Date of Substantial Completion.

3.07 MAINTENANCE

A. Comply with DSA BU 08-07 and manufacturer's recommendations.

END OF SECTION

SECTION 33 40 00
STORM DRAINAGE

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Contractor shall furnish all labor, materials, services, testing, transportation and equipment necessary for the completion of all piping and including the demolition and removal of certain equipment, piping and appurtenances all as required and as indicated on drawings and specified herein. Work materials and equipment not indicated or specified which is necessary for the complete and proper operation of the work of this Section in accordance with the true intent and meaning of the contract documents shall be provided and incorporated at no additional cost to the Owner.

B. Supply and installation of underground storm drain system within the owner's property as shown on the construction documents.

1.2 SUBMITTALS

A. Product Data: Manufacturer's catalog data for all required materials. Include technical data for pipe, drain inlets, catch basins, grates, information concerning gaskets, joints and couplings, sand bedding, tracer wire and detectable warning tape.

B. Contractor is responsible for providing shoring plans to the Inspector for approval prior to construction. Excavation shall have sheeting, shoring and bracing conforming to CAL/OSHA requirements. Lateral pressures for design of sheeting, shoring and bracing shall be based on type of soil exposed, groundwater conditions, surcharge loads adjacent to the excavation and type of shoring that will be used.

1.3 RELATED SECTIONS

A. Trenching Requirements: Conform to the requirements of Section 31 20 00 – Earthwork.

1.4 LICENSES, PERMITS & FEES

A. The Contractor shall have a Class "C-34", "C-36", "C-42" or Engineering "A" Contractors license valid in the State of California.

B. The Contractor shall obtain all necessary permits, licenses, or agreements required by any legally constituted agency, pay for all fees and give all necessary notices required for the construction of the work.

C. The Owner shall reimburse the contractor for all necessary permits or inspection fees by any legally constituted agency.

1.5 QUALITY ASSURANCE

A. The work provided herein shall conform to and be in accordance with the Contract Plans, General Conditions/Specifications and Special Provisions, as well as the Standard Specifications for Public Works Construction ("Green Book"), 2024 Edition, adopted by the Southern California Chapter, American Public Works Association; herein referred to as the "Standard Specifications".

1.6 PROTECTION

A. All work, equipment and materials shall be protected at all times. Contractor shall make good all damage caused either directly or indirectly by his own workmen. Contractor shall also protect his own work from damage. He shall close all pipe openings with caps or plugs during installation. He shall protect all his equipment and materials against dirt, water, chemical and mechanical injury. Upon completion, all work shall be thoroughly cleaned and delivered in a new condition.

B. Contractor shall be held responsible for all damage to equipment and materials until he has received written notice from the Architect or Engineer that his work has been accepted.

1.7 SEQUENCING AND SCHEDULING

A. Coordinate with other utility work.

1.8 DISPOSAL OF REMOVED MATERIALS

A. All removed materials, except those indicated on the plans or described herein to remain the property of the Owner, shall become the property of the Contractor and shall be disposed in accordance with local, state, and federal laws. Should any of those materials be considered as hazardous the Contractor shall provide the Owners Inspector with paper custody trail documentation of the disposal.

1.9 SUBSTITUTIONS

A. The Contractor assumes full responsibility that alternate manufacturers, items and procedures will meet the job requirements and is responsible for cost of redesign and of modifications to this and other parts of work caused by alternate items furnished under work in this Section. In view of these responsibilities, it is the purpose of these specifications to establish procedures which ensure that the Contractor has considered all the ramifications of proposed alternates before submitting them for review. Submittals which do not comply with the requirements of these specifications or which indicate proposed alternates were selected without proper regard to the requirements of the job, will not be approved. No more than one proposed alternate will be considered for each item.

B. This Contractor is responsible to provide sufficient information to allow the Engineer to analyze any proposed alternate. If inadequate information is provided, the proposal will not be approved and resubmittal will not be allowed.

C. The Architect or his authorized representative shall be the sole judge as to the quality and suitability of proposed alternate equipment, fixtures or materials and decisions of the Architect or that of his representative shall be final and conclusive.

1.10 RECORD DRAWINGS

A. Contractor shall provide and keep up-to-date a complete "as-built" record set of redline prints which shall show every change from the original drawings and the exact "as-built" locations and sizes of the work provided under this Section of the specifications. This set shall include locations, dimensions, depth of buried piping, pipe invert locations, drain basins, etc. On completion of the work, the Contractor shall incorporate all as-built information on a set of reproducible tracings provided by the Architect and this set of reproducibles shall be delivered to the Architect.

1.11 INSPECTION OF WORK

A. Contractor shall not allow or cause any of his work to be covered up before it has been duly inspected, tested and approved by the Owner or any other authorized inspectors having legal jurisdiction over his work. Should he fail to observe the above, he shall uncover the work and, after it has been inspected, tested and approved, recover it at his own expense.

B. Inspection of the work shall not relieve the contractor of any obligations to complete the work as prescribed by the standard specifications. Any known defective work shall be corrected before testing or final inspection will be permitted. Unsuitable materials may be rejected even if these materials have been previously overlooked by the Inspector.

C. The Owner shall have the authority to suspend the work completely or in part for such time as it may deem necessary if the contractor fails to carry out instructions given by the Owner, or to perform any required provisions of the plans and specifications. The contractor shall immediately comply with a written order of the Owner to suspend the work completely or in part. The work shall be resumed when improper methods or defective work are corrected as ordered and approved in writing by the Owner.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Solid Wall Piping Materials

1. Poly Vinyl Chloride (PVC) Sewer Pipe, ASTM D-3034, SDR-35. The pipe will have a permanently installed reinforced rubber ring gasket in an integral bell joint. PVC Sewer Fittings SDR-35 shall be manufactured in accordance with ASTM Standards D-3034 and F-1336 or F-679. The PVC material shall have a minimum cell classification of 12454-B, 12454-C or 12364-C as defined in ASTM D-1784.

2. Cast iron soil, hubless, with stainless steel-banded hubless couplings. No-hub cast iron soil pipe and fittings shall conform to ASTM A 888 and/or standard specifications 301 of the Cast Iron Soil Pipe Institute. No-hub joints shall conform to specification 310 of the Cast Iron Soil Pipe Institute and/or ASTM C 1277. Joints shall be installed according to manufacturer's recommendations. Manufactured by American Foundry, Tyler, or equal.

3. Poly Vinyl Chloride (PVC) Plastic Pipe, Schedule 40, meeting ASTM D 1785 standards. Fittings shall conform to ASTM D 2467 "Socket-Type PVC Plastic Type Fittings, Schedule 40.

B. Pre-Cast Concrete Catch Basins:
   1. Jensen Precast
   2. Eisel Enterprises Inc
   3. J&R Concrete Products
   4. Approved Equal

C. Grates & Covers:
   1. All grates and covers must be vandal proof / bolt down type.
   2. A.D.A. - Where noted on the plans install A.D.A. grates on catch basins. A maximum spacing between grating bars in accessible path of travel is 1/2 inch in the direction of travel, or 1/2 inch in either direction when the path of travel is not limited to one direction.
   3. Heel Proof - Where noted on the plans install heel proof grates on catch basins requiring a maximum ¼ inch opening.

D. Steel Reinforcing Bars: ASTM A 615 deformed grade 40 billet steel, plain finish, unless otherwise specified on Construction Document.

E. Concrete, Mortar and Related Materials: Conform to Section 32 13 13: Concrete Paving.

F. Manhole Brick Mortar, Grout, and Plaster: Conform to Standard Specifications for Public Works Construction, Section 202 - Masonry Materials.

G. Paint and Protective Coatings

   1. All storm drain hardware, including frames and covers, grates, protection bars, steps, etc., shall be protected from corrosion. Storm drain hardware made of cast iron shall be protected by painting with, or dipping in, a commercial grade asphalt paint. Storm drain hardware made of steel shall be galvanized.

   2. Hot-dip galvanize steel parts after fabrication and before installation, in accordance with Section 210 - Paint and Protective Coating of the Standard Specifications for Public Works Construction.

PART 3 - EXECUTION

3.1 PIPELINE INSTALLATION

A. Existing utilities: Locate existing underground utilities in all areas of work prior to excavation or commencement of work. If utilities are to remain in place provide adequate means of protection during trenching operations.

B. Install pipeline in a practical alignment and uniform slope to the point of connection as indicated on Construction Document. Prior to trench excavation, verify size, material, depth, and location of the point of connection. Notify Civil Engineer if point of connection elevation is different then that shown on construction drawing as it may affect the design of the system.

C. Excavating, trenching, and backfilling are specified in Section 31 20 00 – Earthwork.

D. No pipe shall be laid until the Geotechnical Project Manager inspects and approves the conditions of the bottom of the trench.

E. All storm drain pipelines, trench drains, catch basins and drain inlets shall be staked by a licensed surveyor if slope of grade is less than 2% and a complete set of cut sheets shall be supplied to the Inspector. All construction staking shall be installed and verified for grade and alignment prior to the start of construction.

F. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground storm drainage piping. Location and arrangement of piping layout take design considerations into account. Install piping as indicated, to extent practical.

G. Use proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.

H. Make connections to existing piping and underground structures so finished work complies as nearly as practical with requirements specified for new work.

I. The cutting of pipe for inserting tees, fittings or closure pieces shall be done in a neat workmanlike manner without damage to the pipe or cement lining and so as to leave a smooth end at right angles to the axis of the pipe. No pipe shall be laid in water or when, in the option of the Engineer trench conditions are unsuitable.

J. Every precaution shall be taken to prevent foreign material from entering the pipe while it is being placed in the trench. If the pipe-laying crew cannot put the pipe into the trench and in place without getting soil into it, the Engineer may require that before lowering the pipe into the trench, a temporary plug be placed over each end and left there until the connection is to be made to the adjacent pipe. During the laying operations, no debris, tools, clothing or other materials shall be left in the pipe.

K. At times when pipe laying is not in progress, the open ends of pipe shall be closed by watertight plug or other means approved by the Engineer. This provision shall apply during the lunch-hour breaks as well as overnight. If water is in the trench, the seal shall remain in place until the trench is pumped completely dry.

L. All grates, frames and covers for drain inlets, catch basins & trench drains shall be locked down to prevent theft after final construction.

3.2 FIELD INSPECTION FOR PIPE & FITTINGS

A. Television Inspection: The entire length of all new storm drain pipe 6" AND GREATER shall be inspected using Closed-Circuit Television (CCTV) equipment. The inspection shall be conducted after the line has been successfully installed, covered with bedding material, and prior to paving. The inspection shall be conducted in the presence of the Inspector. All labor and equipment necessary to conduct the CCTV inspection shall be furnished by the Contractor. CCTV inspection shall be per the following.

1. Record the inspection using a four-head, VHS format, video cassette recorder in standard play mode. Deliver the original videotapes, audio commentary, log sheets, and reports to the I.O.R. at the close of the each working day. As desired, the Contractor may produce duplicates for his own use. At the option of the Contractor, or request of the Owner, the video recordings may be converted to MPEG format and copied unto a DVD compatible with Microsoft software.

2. CCTV Equipment: Camera: Remote-controlled, focus from 6" to infinity. Resolution at 450 lines per inch, minimum. During the reinstatement of laterals, only use "rotating lens" or "pan and tilt" cameras. Footage counter: Accurate within ±1%. Include the real time counter measurement as a caption on the recorded tape. Use maintenance hole stations and maintenance hole numbers as references. Television monitor: Color, minimum 460 lines per inch resolution. Lighting: Adequate to fully illuminate the pipeline and positioned to not produce glare. Mobility: Capable of steadily traveling with or against the flow. The maximum speed while inspecting and recording is 9 m per minute (30 feet per minute).
3. Quality of CCTV Inspection Record: The recorded video image must clearly show the full circumference of the pipeline, in focus, with adequate lighting to see detail, with uniform and steady travel, and depicting the date and time of inspection, footage of travel, street, project title and pipe size. At laterals, service connections and pipe defects, provide a closer, more detailed examination and document the orientation, location and size. The written records must further describe those laterals, service connections and pipe defects and index them to their location on the video record.

4. Introduce water into the upstream end of the pipe for the required length of time such that the water flow leaving the pipe at the downstream end equals the flow entering the upstream end of the pipe. Discontinue water flow and perform the CCTV inspection of the pipe.

5. If debris is encountered, retrieve the CCTV unit, re-clean the pipeline and resume CCTV inspection. Pipe will be considered acceptable when the video camera records no ponding of water (except in joint recesses) within the pipe, no breaks in the pipe and no openings or breaks at the joints, and the pipe is clean and free of dirt and debris. Remove and replace, or readjust to grade, any pipe failing to meet the acceptable video requirements.

6. At the completion of the video inspection, one copy of the tapes shall be turned over to the I.O.R.

7. Defects requiring correction include the following:
    1) Alignment: Less than full diameter of inside of pipe is visible between structures.
    2) Crushed, broken, cracked, or otherwise damaged piping.
    3) Exfiltration: Water leakage from or around piping.
    4) Infiltration: Water leakage into piping.

    b. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.

    c. Re-inspect and repeat procedure until results are satisfactory.

END OF SECTION