PROJECT MANUAL

PROJECT NUMBER: 22-519-03

YCHS GYM MECHANICAL

YUBA CITY UNIFIED SCHOOL DISTRICT

Issued: February 16, 2023

DOCUMENT 00 01 10

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END OF DOCUMENT

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DRAWINGS

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E0.1	Electrical General Notes and Legends
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SCHEDULES

Voluntary Site Walk	February 24, 2023 at 9:00 a.m.
Request for Information by	March 9, 2023 by 4:00 p.m.
Final Addendum by	March 13, 2023 by 4:00 p.m.
Bid Due/Opening	Tuesday, March 16, 2023 at 10:00 a.m.
Work Schedule	April 10, 2023 to December 21, 2023 (dependent on equipment availability)

END OF DOCUMENT

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INVITATION TO BID

1. Notice is hereby given that the governing board ("Board") of the Yuba City Unified School District ("District" or "Owner") will receive sealed bids for the following project ("Project" or "Contract"):

   Project No.: **22-519-03**;
   Project Name: **YCHS GYM MECHANICAL**.

2. Sealed Bids will be received until **10:00 a.m., Tuesday, March 16, 2023**, at the **Maintenance/Facilities Office, located at 1512 Stewart Road, Yuba City, CA 95993**, at or after which time the Bids will be opened and publicly read aloud. Any claim by a bidder of error in its Bid must be made in compliance with Section 5100 et seq. of the Public Contract Code. Any Bid that is submitted after this time shall be non-responsive and returned to the Bidder.

3. The Project consists of:

   The contractor shall provide all labor, equipment, and materials to replace an approximately 60-ton ground-mounted, gas fired, DX cooling air conditioning unit (AC) including new Pelican controls. Replacement units shall be equivalent or better than existing units. Contractor shall connect units to existing ductwork, electrical, and natural gas for heating. Unit is located on the Main Gym at Yuba City High School, 850 B Street, Yuba City, CA 95991.

4. All Bids shall be on the form provided by the District. Each Bid must conform to, and be responsive to, all pertinent Contract Documents. The Contract Documents include, by way of illustration and not by limitation, the Instructions to Bidders.

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

   B – GENERAL BUILDING and/or C-20

   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.

6. 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 Yuba City 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 seven (7) 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.

7. The successful Bidder shall furnish to the District a 100% Performance Bond and a 100% Payment Bond if it is awarded the contract for the Project.

8. In accordance with the provisions of Section 22300 of the Public Contract Code, the successful Bidder may substitute securities for any monies withheld by the District to ensure performance under the Contract.

9. 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 Sections 1770 et seq. of the California Labor Code. Prevailing wage rates are available from the District or on the Internet at: <http://www.dir.ca.gov>. Bidders and Bidders' subcontractors shall comply with the registration and qualification requirements pursuant to Sections 1725.5 and 1771.1 of the California Labor Code.

10. A voluntary pre-bid conference and **site visit** will be held on **February 24, 2023 at 9:00 a.m. at Yuba City High School, 850 B Street, Yuba City, CA 95991**. All participants are required to sign in at the Administration Building. The Site Visit is expected to take approximately one (1) hour.

11. Contract Documents are available on **February 16, 2023**, for review at the District Facilities Office located at 1512 Stewart Road, Yuba City, CA 95993. In addition, Contract Documents are available for review at the following builders' exchanges:

CONSTRUCTION BIDBOARD
DODGE DATA AND ANALYTICS
SACRAMENTO REGIONAL BUILDER'S EXCHANGE
VALLEY CONTRACTOR'S EXCHANGE

Contract Documents are also available for review and download from the District's website at https://www.ycusd.org/Departments/Maintenance/Projects-Currently-Out-to-Bid/index.html.

12. 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) calendar days from the time the award is made. Unless otherwise required by law, no Bidder may withdraw its bid for ninety (90) calendar days after the date of the Bid opening.

13. The District shall award the Contract, if it awards it at all, to the lowest responsive responsible Bidder.

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.

Yuba City Unified School District ("District" or "Owner") will evaluate information submitted by the apparent low Bidder and, if incomplete or unsatisfactory to the District, the Bidder's Bid may be rejected at the sole discretion of the District.

1. **Project.** Bids are requested for a general construction contract, or work described in general, for the following project ("Project" or "Contract"): **YCHS GYM MECHANICAL**.

2. **Sealed Bids.** The District will receive sealed Bids from Bidders as indicated in the Notice to Bidders and each Bidder shall ensure that its Bid:

a. Is sealed and marked with the 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;

b. Contains all documents as required herein; and

c. Is submitted by the date and time shown in the Notice to Bidders.

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

4. **Bid Form.** Bidders must submit Bids on the Bid Form and utilize 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 permitted. 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.

5. **Complete Bids.** Bidders must supply all information required by each Bid Document. Bids must be full and complete. The 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. Bidders must complete and submit all of the following documents with the Bid Form:

- Bid Bond or other security
- Designated Subcontractors List
- Certification: Site-Visit, if a site visit was required
- Noncollusion Declaration

a. **Bid Bond or Other Security.** With their Bid Form, each Bidder must submit cash, a cashier's check, a certified check payable to the District, or a Bid Bond by an admitted surety insurer (in an amount not less than ten percent (10%) of their base Bid amount, including all additive alternates.)

- The required form of corporate surety, Bid Bond, is provided by the 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.

b. **Designated Subcontractors List.** A Designated Subcontractors List of those subcontractors who will perform any portion of the 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 that is in excess of one half of one percent (0.5%) of the total Bid must be submitted with the Bid. Failure to submit this list, when required by law, shall result in the Bid being deemed non-responsive and the Bid will not be considered.

c. **Site Visit Certification.** If a mandatory pre-bid conference and site visit ("Site Visit") is required in the Notice to Bidders, then Bidders must submit the Certification: Site-Visit with their Bid. The District will transmit to all prospective Bidders of record such Addenda as the District in its discretion considers necessary in response to questions presented at the Site Visit. Oral statements shall not be relied upon and will not be binding or legally effective. Addenda issued by the District as a result of the Site Visit, if any, shall constitute the sole and exclusive record and statement of the results of the Site Visit.

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

6. **Erasures.** Bids shall be clearly written without erasures or deletions. The District reserves the right to reject any Bid containing erasures or deletions.

7. **Words / Numerals.** Discrepancies between written words and numerals will be resolved in favor of written words.

8. **Prevailing Wages.** Pursuant to Sections 1770 et seq. of the California Labor Code, the Bidder and all Subcontractors under the Bidder shall pay all workers for 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 available from the District or on the internet (http://www. dir.ca.gov).

9. **Contractor Registration.** The 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. The 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.

10. **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.

11. **Bidder Diligence.** Submission of a 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. Submission of a Bid constitutes the Bidder's express representation to the District that the Bidder fully completed the following:

a. Has visited the Project Site, if required.

b. Has examined thoroughly and understands 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 the Work or that relate to any aspect of the means, methods, techniques, sequences, or procedures of construction to be employed by the Bidder and safety precautions and programs incident thereto.

c. Has conducted or obtained and understands 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 that otherwise may affect the cost, progress, performance, or furnishing of the Work, as the Bidder considers necessary for the performance or furnishing of the Work at the Contract Price, within the Contract Time, and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of the General Conditions; and no additional examinations, investigations, explorations, tests, reports, studies, or similar information or data are or will be required by the Bidder for such purposes.

d. Has correlated its knowledge and the results of all such observations, examinations, investigations, explorations, tests, reports, and studies with the terms and conditions of the Contract Documents.

e. Has given the District 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 District's written resolution thereof is acceptable to the Bidder.

f. Has made a complete disclosure in writing to the District of all facts bearing upon any possible interest, direct or indirect, that the 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.

g. Prior to bidding, has performed the work, investigations, research, and analysis required by the Instructions to Bidders and that the Bidder has represented in its Bid Form and the Agreement that it performed these tasks prior to bidding. **The 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.**

h. 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, the District only warrants, and the 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 such information is correctly shown or indicated. This information is verifiable by independent investigation and the Bidder is required to make such verification as a condition to bidding. In submitting its Bid, the Bidder shall rely on the results of its own independent investigation. In submitting its Bid, the 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, the 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. The District is not responsible for the completeness of such information for bidding or construction; nor is the District responsible in any way for any conclusions or opinions of the Bidder drawn from such information; nor is the District responsible for subsurface conditions that are not specifically shown (for example, the

District is not responsible for soil conditions in areas contiguous to areas where a subsurface condition is shown).

(3) Conditions Shown in Reports and Drawings Supplied for Informational Purposes: Reference is made to the document entitled Geotechnical Data, and the document entitled Existing Conditions, for identification of:

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

(ii) 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 the Architect in preparing the Contract Documents.

(4) These reports and drawings are **not** Contract Documents and, except for any "technical" data regarding subsurface conditions specifically identified in Geotechnical Data and Existing Conditions, and underground facilities data, the Bidder may not in any manner rely on the information in these reports and drawings. Subject to the foregoing, the Bidder must make its own independent investigation of all conditions affecting the Work and must not rely on information provided by the District.

12. **As-Builts.** Bidders may examine any available "as-built" drawings of previous work by giving the District reasonable advance notice. The District will not be responsible for the accuracy of "as-built" drawings. The document entitled Existing Conditions 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 such 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. The 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 Special Conditions, the Specifications and the following:

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

(1) The District must receive any request for substitution a minimum of **SEVEN (7)** calendar days prior to the date of Bid opening.

(2) 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. The Bidder's Bid shall be deemed non-responsive if it identifies a product or manufacturer of a non-approved substitution.

(3) Approved substitutions shall be listed in Addenda.

(4) The District reserves the right not to act upon submittals of substitutions until after the date of Bid opening.

b. **Substitutions after Bid Award.** Substitutions may be requested after a Contract has been awarded only if provisions for such are set forth in the Special Conditions and the request is made in accordance with requirements set forth in the Special Conditions.

All requests for substitutions shall contain sufficient information to assess acceptability of the product or system and impact to the Project, including, without limitation, the requirements specified in the Special Conditions and the Specifications. Insufficient information shall be grounds for rejection of the request for substitution.

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 Notice to Bidders.

17. **Notice of Award.** The Bidder awarded the Contract shall execute and submit the following documents by 5:00 p.m. of the **SEVENTH (7TH)** calendar day following the date of the Notice of Award. Failure to properly and timely submit these documents entitles the District to, among other remedies, make a claim against the Bidder's Bid Bond or deposit the Bidder's cash, cashier's check, or certified check. The proceeds thereof may be retained, in the District's sole discretion, by the District as liquidated damages.

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

b. Escrow of Bid Documentation: This must include all required documentation. See the document Escrow of Bid Documentation for more information.

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

d. 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.

e. Insurance Certificates and Endorsements: As required.

f. Workers' Compensation Certification.

g. Certification: Prevailing Wage and Related Labor Requirements.

h. Disabled Veterans' Business Enterprise Participation Certification.

i. Certification: Drug-Free Workplace.

j. Smoke-Free Environment Certification.

k. Certification: Hazardous Materials.

l. Certification: Lead-Based Paint.

m. Certification: Imported Materials.

n. Certification: Criminal Background Investigation/Fingerprinting.

o. Certification: Roofing Contract Financial Interest.

18. **Notice to Proceed.** The 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, the Contractor shall complete the Work within the period of time indicated in the Contract Documents. The Contractor acknowledges and agrees that the 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 the Contractor.

b. The Contractor agrees that the Contractor shall not be entitled to any claim of additional compensation as a result of the postponement of the issuance of the Notice to Proceed beyond the 3-month period. If the Contractor believes that a postponement of issuance of the Notice to Proceed will cause a hardship to the Contractor, the Contractor may terminate the Contract. The Contractor's termination due to a postponement beyond the 3-month period shall be by written notice to the District within **SEVEN (7)** calendar days after receipt by the Contractor of District's notice of postponement.

c. The Contractor agrees that if the Contractor terminates the Contract as a result of postponement by the District, the District shall only be obligated to pay the Contractor for the Work that the Contractor had performed at the time of notification of postponement and which the District had in writing authorized the Contractor to perform prior to issuing a Notice to Proceed.

d. Should the Contractor terminate the Contract as a result of a notice of postponement, the District may (in its sole discretion) award the Contract to the next lowest responsive responsible bidder.

19. **Bid Protests.** In lieu of the bid protest procedures specified in District AR 3311, the following protest procedures shall apply to any bid protest by any Bidder regarding any other bid on this Project. 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.

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. Such parties shall 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 action.

20. **Rejection of Bids.** The 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 the 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 the District. The 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 Responsibility.** Prior to the award of Contract, the District reserves the right to consider the responsibility of the Bidder. The District may conduct investigations as the 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 the District's satisfaction within the prescribed time.

END OF DOCUMENT

DOCUMENT 00 31 19

EXISTING CONDITIONS

1. Summary.

This document describes (1) existing conditions at or near the Project and (2) 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.

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 the 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) Original Construction Drawings.
(2) Survey of Site.
(3) Hazardous Material Reports

3. Use of Information.

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

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

c. Under no circumstances shall the 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 the Contractor by the performance of its own independent investigation that Contractor must perform as a condition to bidding, and the Contractor should not and shall not rely on this information or any other information supplied by the 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 the District by the District's employees and/or consultants or builders of such underground facilities or others. The 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. The District is responsible only for the general accuracy of information regarding underground facilities, and only for those underground facilities that are owned by the 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. 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 the 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, the 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 Notice to Bidders 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 the District's prior approval.

END OF DOCUMENT

DOCUMENT 00 41 13

BID FORM

To: Governing Board of Yuba City Unified School District ("District" or "Owner")

From: _____
(Legal Name of Bidder)

The Bidder declares that the Contract Documents including, without limitation, the Notice to Bidders, 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 of Project No. **22-519-03**

PROJECT: **YCHS GYM MECHANICAL**

("Project" or "Contract") and will accept in full payment for that Work the following total lump sum amount, all taxes included:

_____ **dollars** **$** _____
TOTAL BASE BID

1. **Contract Review.** The Bidder 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) described in the Contract Documents, and that if Bidder is awarded a contract, Bidder 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.

2. **Requests for Clarification.** The Bidder 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.

3. **Contract Time.** The Bidder 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.

4. **Contractual Provisions.** The Bidder hereby acknowledges and agrees to be bound by the 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 Claims.

5. **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.

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

- The Bid Bond on the District's form or other security.
- The Designated Subcontractors List.
- The Noncollusion Declaration.

7. **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.	

8. **Bidder's License.**

- The Bidder acknowledges that the license required for performance of the Work is as stated in the Invitation to Bid.

- The Bidder certifies that it is, at the time of bidding, and shall remain 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. The Bidder further certifies that it is regularly engaged in the general class and type of work called for in the Contract Documents.

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

10. **DIR Registration.** The 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.

11. **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. The 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. The 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.

12. **False Claims Act.** The 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 Bidder may be subject to criminal prosecution.

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

Dated this _____ day of _____ 20 _____

Name of Bidder _____

Type of Organization _____

Signed by _____

Title of Signer _____

Address of Bidder _____

Taxpayer's Identification No. of Bidder _____

Telephone Number _____

Fax Number _____

E-mail _____ Web page _____

Bidder's DIR Registration No.: No.:_____

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

No.: _____ Class: _____ Expiration Date: _____

No.: _____ Class: _____ Expiration Date: _____

If Bidder is a corporation, provide the following:

Name of Corporation: _____

President: _____

Secretary: _____

Treasurer: _____

Manager: _____

END OF DOCUMENT

DOCUMENT 00 43 13

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

KNOW ALL PERSONS BY THESE PRESENTS:

That 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 admitted to do business as a surety in the State of California, are held and firmly bound unto the

Yuba City Unified School District ("District") of Sutter County, State of California as Obligee, in the sum of

_____ ($ _____)

lawful money of the United States of America, for the payment of which sum well and truly to be made, we, and each of us, bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

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;

NOW, THEREFORE,

1. If said bid shall be rejected, or in the alternate,

2. If said bid shall be accepted and the Principal, within the time and manner required under the Contract Documents, shall (a) execute a contract in the form of the Contract Documents, (b) file two bonds, one guaranteeing faithful performance and the other guaranteeing payment for labor and materials as required by law, and (c) meet all other conditions to the contract between the Principal and the Obligee becoming effective, or in the alternate,

3. If the Principal shall fully reimburse and save harmless the Obligee from any damage sustained by the Obligee through failure of the Principal to (a) execute a contract in the form of the Contract Documents, (b) file two bonds, one guaranteeing faithful performance and the other guaranteeing payment for labor and materials as required by law, or (c) 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. The full payment of the sum stated above shall be due immediately if Principal fails to execute the Contract within seven (7) days of the date of the District's Notice of Award to Principal.

Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or the call for bids, or to the work to be performed thereunder, or the specifications accompanying the same, shall in any way affect its obligation under this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or 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 such 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 the _____ day of _____, 20___.

_____
Principal

_____
By

_____
Surety

_____
By

_____
Name of California Agent of Surety

_____
Address of California Agent of Surety

_____
Telephone Number of California Agent of Surety

The 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

PROJECT: **YCHS GYM MECHANICAL**.

1. The 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. The 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 the Bidder's total Bid.

2. As to any Work for which the Bidder fails to list a Subcontractor, the Bidder agrees to perform that portion itself or be subjected to penalty under applicable law.

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

4. In case more than one Subcontractor is named for the same scope of Work, state the portion that each will perform.

5. The Bidder need not list entities that are only vendors or suppliers of materials.

6. The Bidder must indicate which, if any, of these Subcontractors are disabled veteran business enterprises (DVBE) and the estimated percentage of the Work those Subcontractor(s) will perform.

7. The Bidder must provide the Contactor State License Board number ("CSLB No.") for all listed Subcontractors.

8. The Bidder must provide the Department of Industrial Relations registration number ("DIR No.") for all listed Subcontractors.

9. 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.

Subcontractor Name: _____ Location: _____

Scope of Work: _____

If DVBE, Percent of Work: _____% CSLB No.: _____ DIR No.: _____

Subcontractor Name: _____ Location: _____

Scope of Work: _____

If DVBE, Percent of Work: _____% CSLB No.: _____ DIR No.: _____

Subcontractor Name: _____ Location: _____

Scope of Work: _____

If DVBE, Percent of Work: _____% CSLB No.: _____ DIR No.: _____

Subcontractor Name: _____ Location: _____

Scope of Work: _____

If DVBE, Percent of Work: _____% CSLB No.: _____ DIR No.: _____

Subcontractor Name: _____ Location: _____

Scope of Work: _____

If DVBE, Percent of Work: _____% CSLB No.: _____ DIR No.: _____

Subcontractor Name: _____ Location: _____

Scope of Work: _____

If DVBE, Percent of Work: _____% CSLB No.: _____ DIR No.: _____

Subcontractor Name: _____ Location: _____

Scope of Work: _____

If DVBE, Percent of Work: _____% CSLB No.: _____ DIR No.: _____

Subcontractor Name: _____ Location: _____

Scope of Work: _____

If DVBE, Percent of Work: _____% CSLB No.: _____ DIR No.: _____

Subcontractor Name: _____ Location: _____

Scope of Work: _____

If DVBE, Percent of Work: _____% CSLB No.: _____ DIR No.: _____

Subcontractor Name: _____ Location: _____

Scope of Work: _____

If DVBE, Percent of Work: _____% CSLB No.: _____ DIR No.: _____

Subcontractor Name: _____ Location: _____

Scope of Work: _____

If DVBE, Percent of Work: _____% CSLB No.: _____ DIR No.: _____

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: _____

Legal Name of Bidder: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

DOCUMENT 00 45 19

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 Contract.

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: _____

Legal Name of Bidder: _____

City, State: _____, _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

DOCUMENT 00 45 26

WORKERS' COMPENSATION CERTIFICATION

PROJECT/CONTRACT NO.: **22-519-03** between Yuba City Unified School District (the "District" or the "Owner") and _____ (the "Contractor" or the "Bidder") (the "Contract" or the "Project").

Labor Code section 3700 in relevant part provides:

> Every employer except the state shall secure the payment of compensation in one or more of the following ways:
>
> (a) By being insured against liability to pay compensation by one or more insurers duly authorized to write compensation insurance in this state.
>
> (b) By securing from the Director of Industrial Relations a certificate of consent to self-insure either as an individual employer, or as one employer in a group of employers, which may be given upon furnishing proof satisfactory to the Director of Industrial Relations of ability to self-insure and to pay any compensation that may become due to his or her employees.

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 the Contract.

Date: _____

Legal Name of Bidder: _____

Signature: _____

Print Name: _____

Title: _____

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

END OF DOCUMENT

DOCUMENT 00 45 50

PREVAILING WAGE AND
RELATED LABOR REQUIREMENTS CERTIFICATION

PROJECT/CONTRACT NO.: **22-519-03** between Yuba City Unified School District (the "District" or the "Owner") and _____ (the "Contractor" or the "Bidder") (the "Contract" or the "Project").

I hereby certify that I will conform to the State of California Public Works Contract requirements regarding prevailing wages, benefits, on-site audits with 48-hours' notice, payroll records, and apprentice and trainee employment requirements, for all Work on the Project including, without limitation, the requirement that it and all of its Subcontractors are registered pursuant to Labor Code section 1771, et seq.

Date: _____

Legal Name of Bidder: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

DOCUMENT 00 45 55

DISABLED VETERAN BUSINESS ENTERPRISE PARTICIPATION CERTIFICATION

PROJECT/CONTRACT NO.: **22-519-03** between Yuba City Unified School District (the "District") and _____ _____ (the "Contractor" or the "Bidder") (the "Contract" or the "Project").

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 the 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, the 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. The 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, the 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: **YCHS GYM MECHANICAL** Project Number: **22-519-03**

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: _____

Legal Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

DOCUMENT 00 45 60

CERTIFICATION: DRUG-FREE WORKPLACE

PROJECT/CONTRACT NO.: **22-519-03** between Yuba City Unified School District (the "District" or the "Owner") and _____ (the "Contractor" or the "Bidder") (the "Contract" or the "Project").

This Certification: Drug-Free Workplace form is required from the successful Bidder pursuant to Government Code sections 8350 et seq., the Drug-Free Workplace Act of 1990. The Drug-Free Workplace Act of 1990 requires that every person or organization awarded a contract or grant for the procurement of any property or service from any state agency must certify that it will provide a drug-free workplace by doing certain specified acts. In addition, the Act provides that each contract or grant awarded by a state agency may be subject to suspension of payments or termination 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.

The District is not a "state agency" as defined in the applicable section(s) of the Government Code, but the District is a local agency and public school district under California law and requires all contractors on District projects to comply with the provisions and requirements of Government Code sections 8350 et seq., the Drug-Free Workplace Act of 1990.

The Contractor shall certify that it will provide a drug-free workplace by doing all of the following:

1. Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensation, possession, or use of a controlled substance is prohibited in the person's or organization's workplace and specifying actions which will be taken against employees for violations of the prohibition;

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

    a. The dangers of drug abuse in the workplace,

    b. The person's or organization's policy of maintaining a drug-free workplace,

    c. The availability of drug counseling, rehabilitation, and employee-assistance programs,

    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 above, and that, as a condition of employment on the contract or grant, the employee agrees to abide by the terms of the statement.

The Bidder agrees to fulfill the terms and requirements of Government Code section 8355 listed above and will publish a statement notifying employees concerning (a) the prohibition of controlled substance at the workplace, (b) establishing a drug-free awareness program, and (c) requiring that each employee engaged in the performance of the contract be given a copy of the statement required by Section 8355(a), and requiring that the employee agree to abide by the terms of that statement.

The Bidder understands that if the District determines that it has 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. The Bidder further understands that, should the Bidder violate the terms of the Drug-Free Workplace Act of 1990, the Bidder may be subject to debarment in accordance with the requirements of Section 8350 et seq.

The Bidder acknowledges that the Bidder is aware of the provisions of Government Code sections 8350 et seq. and hereby certifies that the Bidder will adhere to the requirements of the Drug-Free Workplace Act of 1990.

Date: _____

Legal Name of Bidder: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

DOCUMENT 00 45 65

CERTIFICATION: TOBACCO-FREE ENVIRONMENT

PROJECT/CONTRACT NO.: **22-519-03** between Yuba City Unified School District (the "District" or the "Owner") and _____ (the "Contractor" or the "Bidder") (the "Contract" or the "Project").

This Certification: Tobacco-Free Environment form is required from the successful Bidder.

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. The District property includes school buildings, school grounds, school-owned vehicles and vehicles owned by others while on District property.

The Bidder acknowledges that the Bidder is aware of the District's policy regarding tobacco-free environments at District sites, including the Project site and hereby certifies that the Bidder will adhere to the requirements of that policy and not permit any of the Bidder's firm's employees, agents, subcontractors, or the Bidder's firm's subcontractors' employees or agents to use tobacco and/or smoke on the Project site.

Date: _____

Legal Name of Bidder: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

DOCUMENT 00 45 70

CERTIFICATION: HAZARDOUS MATERIALS

PROJECT/CONTRACT NO.: **22-519-03** between Yuba City Unified School District (the "District" or the "Owner") and _____ (the "Contractor" or the "Bidder") (the "Contract" or the "Project").

1. The Bidder hereby certifies 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 effect any portion of the Bidder's work on the Project for the District.

2. The Bidder further certifies that it has instructed its employees with respect to the above-mentioned standards, hazards, risks, and liabilities.

3. 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.

4. 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 the Bidder if the material is found to be New Hazardous Material.

5. 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 the Bidder's expense at no additional cost to the District.

6. The Bidder has read and understood the document Hazardous Materials Procedures & Requirements, and shall comply with all the provisions outlined therein.

Date: _____

Legal Name of Bidder: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

DOCUMENT 00 45 75

LEAD-BASED MATERIALS CERTIFICATION

PROJECT/CONTRACT NO.: **22-519-03** between Yuba City Unified School District (the "District" or the "Owner") and _____ (the "Contractor" or the "Bidder") (the "Contract" or the "Project").

This certification provides notice to the Bidder that:

(1) The Bidder's work may disturb lead-containing building materials.

(2) The Bidder must notify the District if any work may result in the disturbance of lead-containing building materials.

1. 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 Bidder and its employees will be providing services for the District, and because the Bidder's work may disturb lead-containing building materials, THE BIDDER 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.

2. 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 Bidder, 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 Bidder 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.

3. 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.

The Bidder, 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.

4. Bidder's Liability

If the Bidder fails to comply with any applicable laws, rules, or regulations, and that failure results in a site or worker contamination, the Bidder 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 Bidder 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 Bidder 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 Bidder shall provide the District with any sample results prior to beginning the 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 Bidder.

The Bidder hereby acknowledges, under penalty of perjury, that it:

1. Has received notification of potential lead-based materials on the District's property;

2. Is knowledgeable regarding and will comply with all applicable laws, rules, and regulations governing work with, and disposal of, lead.

The undersigned warrants that he/she has the authority to sign on behalf of and bind the Bidder. The District may require proof of such authority.

Date: _____

Legal Name of Bidder: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

DOCUMENT 00 45 80

CERTIFICATION: IMPORTED MATERIALS

PROJECT/CONTRACT NO.: **22-519-03** between Yuba City Unified School District (the "District" or the "Owner") and _____ (the "Contractor" or the "Bidder") (the "Contract" or the "Project").

This form shall be executed by Bidder and by all entities that, in any way, provide or deliver and/or supply any soils, aggregate, or related materials ("Fill") to the Project Site. All Fill 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 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.

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.

Certification of:	□ Delivery Firm/Transporter	□ Supplier	□ Manufacturer
	□ Wholesaler	□ Broker	□ Retailer
	□ Distributor	□ Other _____	
Type of Entity:	□ Corporation	□ General Partnership	
	□ Limited Partnership	□ Limited Liability Company	
	□ Sole Proprietorship	□ Other _____	

Name of firm ("Firm"): _____

Mailing address: _____

Addresses of branch office used for this Project: _____

If subsidiary, name and address of parent company: _____

By my signature below, I hereby certify on behalf of the firm identified below ("Firm") that Firm is aware of Section 25260 of the Health and Safety Code and the sections referenced therein regarding the definition of hazardous material. Firm further certifies that all soils, aggregates, or related materials provided, delivered, and/or supplied or that will be provided, delivered, and/or supplied by this Firm to the Project Site are free of any and all hazardous material as defined in Section 25260 of the Health and Safety Code. I further certify that I am authorized to make this certification on behalf of the Firm.

Date: _____

Legal Name of Firm: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

DOCUMENT 00 45 85

CERTIFICATION: CRIMINAL BACKGROUND INVESTIGATION / FINGERPRINTING

PROJECT/CONTRACT NO.: **22-519-03** between Yuba City Unified School District (the "District" or the "Owner") and _____ (the "Contractor" or the "Bidder") (the "Contract" or the "Project").

The undersigned does hereby certify to the governing board of the District that:

(1) He/she is a representative of the Bidder;

(2) He/she is familiar with the facts herein certified;

(3) He/she is authorized and qualified to execute this certificate on behalf of the Bidder; and

(4) That the information in this Certification: Criminal Background Investigation/Fingerprinting is true and correct.

1. **Education Code.** The Bidder has taken at least one (1) of the following actions with respect to the Project (check all that apply):

_____ The Bidder has complied with the fingerprinting requirements of Education Code section 45125.1 with respect to all Bidder's employees and all of its subcontractors' employees who may have contact with District pupils in the course of providing services pursuant to the Contract, and the California Department of Justice ("DOJ") has determined (per the DOJ process for Applicant Agencies described more fully on its website, located at: http://oag.ca.gov/fingerprints/agencies) that none of those employees have been convicted of a felony, as that term is defined in Education Code section 45122.1. A complete and accurate list of Bidder's employees and of all of its subcontractors' employees who may come in contact with District pupils during the course and scope of the Contract is attached hereto; and/or

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

_____ Pursuant to Education Code section 45125.2, the Bidder certifies that all employees will be under the continual supervision of, and monitored by, an employee of the Bidder 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 Bidder's employees and its subcontractors' employees is:

Name: _____

Title: _____

_____ The Work on the Contract is at an unoccupied school site and no employee and/or subcontractor or supplier of any tier of the 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 the Bidder 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/).

The Bidder'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 Bidder.

Date: _____

Legal Name of Bidder: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

DOCUMENT 00 45 90

CERTIFICATION: ROOFING CONTRACT FINANCIAL INTEREST
(Public Contract Code § 3006)

PROJECT/CONTRACT NO.: **22-519-03** between Yuba City Unified School District (the "District" or the "Owner") and _____ (the "Contractor" or the "Bidder") (the "Contract" or the "Project").

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 ($21,000.00) or less.

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

Date: _____

Legal Name of Bidder: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

DOCUMENT 00 51 00

NOTICE OF AWARD

Dated: _____, 20___

To: _____
(Name)

_____
(Address)

From: Governing Board ("Board") of Yuba City Unified School District ("District" or "Owner")

Re: **YCHS GYM MECHANICAL** ("Project" or "Contract").

The Contractor was awarded the Contract on _____, 20___, by action of the District's Board.

The Contract Price is _____ Dollars ($_____).

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.

The Contractor must comply with the following conditions precedent within **SEVEN (7)** calendar days of the date of this Notice of Award.

The Contractor shall execute and submit the following Contract Documents by 5:00 p.m. of the **SEVENTH (7TH)** calendar day following the date of the Notice of Award. Failure to properly and timely submit the following Contract Documents entitles the District to reject the Contractor's bid as non-responsive.

a. Agreement: Submit four (4) copies, each bearing an original signature. **If the Contractor is a corporation, the 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. Escrow of Bid Documentation: Include all required documentation. Refer to the Escrow of Bid Documentation document for details.

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

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

e. Insurance Certificates and Endorsements.

f. Workers' Compensation Certification.

g. Certification: Prevailing Wage and Related Labor Requirements.

h. Disabled Veterans' Business Enterprise Participation Certification.

i. Certification: Drug-Free Workplace.

j. Smoke-Free Environment Certification.

k. Certification: Hazardous Materials.

l. Certification: Lead-Based Paint.

m. Certification: Imported Materials.

n. Certification: Criminal Background Investigation/Fingerprinting.

o. Certification: Roofing Contract Financial Interest

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

The District will return to the Contractor one (1) fully signed counterpart of the Agreement.

Yuba City Unified School District

BY: _____

NAME: _____

TITLE: _____

END OF DOCUMENT

DOCUMENT 00 52 13

AGREEMENT

THIS AGREEMENT IS MADE AND ENTERED INTO THIS _____ DAY OF _____ _____, 20___, by and between the Yuba City Unified School District ("District" or "Owner") and _____ _____ ("Contractor") ("Agreement" or "Contract"). The District and the Contractor agree as follows:

1. **The Work:** The 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:

PROJECT: **YCHS GYM MECHANICAL**

("Project" or "Contract" or "Work").

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 the Contractor are fully set forth and described in the Contract Documents. The Contract Documents are to be interpreted 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:** 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, 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 (Specifications – General Conditions; Documents beginning with "01");

(viii) Division 2 through Division 32 documents (Technical Specifications);

(ix) Figured dimensions;

(x) Large-scale drawings;

(xi) Small-scale drawings.

In no case shall a document calling for lower quality and/or quantity material or workmanship control. The decision of the District in the matter shall be final.

3. **Time for Completion:** It is hereby understood and agreed that the Contractor shall complete the Work within **TWO HUNDRED FIFTY-FIVE (255)** 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 the Contractor. A schedule showing the Work completed in less than the Contract Time indicated in the Contract, shall be considered to have Project Float.

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

5. **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 the District will sustain in the event of and by reason of the Contractor's delay; therefore, the Contractor shall forfeit to the District the following sum(s) ("Liquidated Damages"): Zero Dollars ($0.00).

   a. It is hereby understood and agreed that neither the total cumulative Liquidated Damages amount nor any portion of the Liquidated Damages amount are penalties.

   b. The District may deduct Liquidated Damages from money due or that may become due to the Contractor under this Agreement. The Contractor's forfeiture of Liquidated Damages to the District, and the 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.

   c. Liquidated Damages are automatically and without notice of any kind forfeited by the Contractor upon the accrual of each day of delay. Neither the District's failure or delay in deducting Liquidated Damages from payments otherwise due the Contractor, nor the District's failure or delay in notifying the Contractor of the forfeiture of Liquidated Damages, shall be deemed a waiver of the District's right to Liquidated Damages.

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

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

   f. The District may extend the Contract Time if Work is delayed for causes outside the Contractor's control, as further described in the General Conditions. This provision does not exclude the recovery of damages for delay by either party under other provisions in the Contract Documents.

6. **Loss or Damage:** The District and its authorized representatives shall not be answerable or suffer loss, damage, expense, or liability for any loss or damage that occurs to the Work, or any part thereof, during its construction and before Completion. The Contractor shall assume all liabilities of every kind or nature arising from the Work, either by accident, negligence, theft, vandalism, or any cause whatever; and shall hold the District and its authorized representatives harmless from all liability of every kind and nature arising from accident, negligence, or any cause whatever.

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

8. **Performance of Work:** If the 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 the Contractor.

9. **Authority of Architect, Project Inspector, and DSA:** The Contractor hereby acknowledges that the Architect(s), the Project Inspector(s), and the Division of the State Architect have authority to not approve and/or to stop Work if the 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. The Contractor shall be liable for any delay caused by its non-compliant Work.

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

11. **Classification of Contractor's License:** The Contractor hereby acknowledges that it currently holds valid **Type B and/or C-20** Contractor's license(s) issued by the State of California, Contractors State License Board, in accordance with division 3, chapter 9, of the Business and Professions Code and in the classification called for in the Contract Documents.

12. **Payment of Prevailing Wages:** The Contractor and all Subcontractors under the 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.

13. **Contractor and Subcontractor Registration:** The 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.

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

_____ Dollars

($_____), (**Base Contract Amount**)

a. The above Allowances are within the Contract Price only to the extent the Contractor has performed Work encompassed by the Allowance description, the Contractor has appropriately invoiced for that Work, and the District has approved the Contractor's invoice. The 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.

15. **Authority of Contractor's Representative:** The Contractor hereby certifies that its legal representative as defined in the General Conditions and the person(s) it employs on the Project at or above the level of project superintendent, each have the authority to legally bind the Contractor.

16. **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 unless doing so would defeat an essential purpose of the Contract.

17. **THE CONTRACTOR SPECIFICALLY AGREES TO ASSERT NO DEMANDS OR CLAIMS IN ARBITRATION OR LITIGATION UNLESS IT HAS STRICTLY COMPLIED WITH THE PROVISIONS IN THE "CLAIMS RESOLUTION" SECTION OF THE GENERAL CONDITIONS (DOCUMENT 00 70 00).**

Contractor's Initials Acknowledging "Claims Resolution" Requirements: _____

18. **THE CONTRACTOR REPRESENTS, UNDER PENALTY OF PERJURY UNDER THE LAWS OF THE STATE OF CALIFORNIA, THAT IT HAS REVIEWED IN DETAIL THE "DISTRICT DELAY(S)" SECTION OF THE SPECIAL CONDITIONS AND THAT THE AMOUNT OF DAMAGES SET FORTH THEREIN REPRESENTS A FAIR AVERAGE COMPENSATION FOR ANY LOSS THAT MAY BE SUSTAINED IN THE EVENT OF THE INSTANCES DESCRIBED IN THAT SECTION.**

Contractor's Initials Acknowledging "District Delay(s)" Requirements: _____

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

Dated: _____, 20___	Dated: _____, 20___
Yuba City Unified School District	_____ **CONTRACTOR**
By: _____	By: _____
Print Name: _____	Print Name: _____
Print Title: _____	Print Title: _____

NOTE: If the Contractor is a corporation, the 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 54 50

ESCROW OF BID DOCUMENTATION

1. Requirement to Escrow Bid Documentation

a. The Contractor shall submit, within **SEVEN (7)** calendar days after the date of the Notice of Award, one copy of all documentary information received or generated by the Contractor in preparation of bid prices for this Contract. This material is referred to as "Escrow Bid Documentation." The Escrow Bid Documentation will be held in escrow by the District for the duration of the Contract.

b. The Contractor agrees, as a condition of award of the Contract, that the Escrow Bid Documentation constitutes **all** written information used in the preparation of its Bid, and that no other written bid preparation information shall be considered in resolving disputes or claims. The Contractor also agrees that nothing in the Escrow Bid Documentation shall change or modify the terms or conditions of the Contract Documents.

c. The Escrow Bid Documentation will not be opened by the District except as indicated herein. The Escrow Bid Documentation will be used only for the resolution of price adjustment discussions, change orders and claims disputes.

d. The Contractor's submission of the Escrow Bid Documentation, as with the bonds and insurance documents required, is considered an essential part of the Contract award. Should the Contractor fail to make the submission within the allowed time specified above, the District may deem the Contractor to have failed to enter into the Contract, and the Contractor shall forfeit the amount of its bid security, accompanying the Contractor's Bid, and the District may award the Contract to the next lowest responsive responsible bidder.

e. **NO PAYMENTS WILL BE MADE, NOR WILL THE DISTRICT ACCEPT PROPOSED CHANGE ORDERS UNTIL THE ESCROW BID DOCUMENTATION IS SUBMITTED AND APPROVED.**

f. The Escrow Bid Documentation shall be submitted in person by an authorized representative of the Contractor to the District.

2. Ownership of Escrow Bid Documentation

a. The Escrow Bid Documentation is, and shall always remain, the property of the Contractor, subject to review by the District, as provided herein.

b. The Escrow Bid Documentation constitutes trade secrets, not known outside the Contractor's business, known only to a limited extent and only by a limited number of employees of the Contractor, safeguarded while in the Contractor's possession, extremely valuable to the Contractor, and could be extremely valuable to the Contractor's competitors by virtue of it reflecting the Contractor's contemplated techniques of construction. Subject to the provisions herein, the District agrees to safeguard the Escrow Bid Documentation, and all information contained therein, against disclosure to the fullest extent permitted by law.

3. Format and Contents of Escrow Bid Documentation

a. The Contractor may submit the Escrow Bid Documentation in its usual cost-estimating format; a standard format is not required.

b. The Escrow Bid Documentation must clearly itemize the estimated costs of performing the work of each Bid item contained in the bid schedule, separating bid items into sub-items as required to present a detailed cost estimate and allow a detailed cost review.

c. **Subcontractors.** The Escrow Bid Documentation shall include all subcontractor bids or quotes, supplier bids or quotes, quantity takeoffs, crews, equipment, calculations of rates of production and progress, copies of quotes from subcontractors and suppliers, and memoranda, narratives, add/deduct sheets, and all other information used by the Contractor to arrive at the prices contained in the Bid proposal.

d. Estimated costs should be broken down into the Contractor's usual estimate categories such as direct labor, repair labor, equipment ownership and operation, expendable materials, permanent materials, and subcontract costs as appropriate. Plant and equipment and indirect costs should be detailed in the Contractor's usual format. The Contractor's allocation of indirect costs, contingencies, markup, and other items to each bid item shall be identified.

e. **All costs shall be identified.** For bid items amounting to less than Ten Thousand Dollars ($10,000.00), estimated unit costs are acceptable without a detailed cost estimate, provided that labor, equipment, materials, and subcontracts, as applicable, are included and provided that indirect costs, contingencies, and markup, as applicable, are allocated.

f. Bid Documentation provided by the District should not be included in the Escrow Bid Documentation unless needed to comply with the following requirements.

4. Submittal of Escrow Bid Documentation

a. The Escrow Bid Documentation shall be submitted by the Contractor in a sealed container within **SEVEN (7)** calendar days after the date of the Notice of Award. The container shall be clearly marked on the outside with the Contractor's name, date of submittal, Project Name and the words "Escrow Bid Documentation – Intended to be opened in the presence of Authorized Representatives of Both District and Contractor."

b. By submitting the Escrow Bid Documentation, the Contractor represents that the material in the Escrow Bid Documentation constitutes all the documentary information used in preparation of the bid and that the Contractor has personally examined the contents of the Escrow Bid Documentation container and has found that the documents in the container are complete.

c. **Subcontractors.** If the Contractor's proposal is based upon subcontracting any part of the work, each subcontractor whose total subcontract price exceeds five percent (5%) of the total contract price proposed by the Contractor, shall provide separate escrow documents to be included with those of the Contractor. Those documents shall be opened and examined in the same manner and at the same time as the examination described above for the Contractor. Each subcontractor's documents can be sealed within the Contractor's Escrow Bid Documentation and will only be opened if the change order or dispute at issue relates to that subcontractor(s)' scope of work.

d. If the Contractor wishes to subcontract any portion of the Work after award of the Contract, the District retains the right to require the Contractor to submit escrow documents for the Subcontractor before the subcontract is approved.

5. Storage, Examination and Final Disposition of Escrow Bid Documentation

a. The Escrow Bid Documentation will be placed in escrow, for the term of the Contract, at the District offices.

b. The Escrow Bid Documentation shall be examined by both the District and Contractor, upon three (3) days' written notice to the other, at any time deemed necessary by either the District or the Contractor, to assist in the negotiation of price adjustments and change orders or the settlement of Claims. In the case of legal proceedings, the Escrow Bid Documentation shall be used subject to the terms of an appropriate protective order if requested by the Contractor and ordered by a court of competent jurisdiction. Examination of the Escrow Bid Documentation is subject to the following conditions:

(1) As trade secrets, the Escrow Bid Documentation is proprietary and confidential to the extent allowed by law. **The Escrow Bid Documentation shall only be viewed by the District or the Contractor or their authorized agents or as may be permitted pursuant to a protective order.**

(2) Access to the Escrow Bid Documentation may take place only in the presence of duly designated representatives of both the District and the Contractor. If the Contractor fails to designate a representative or appear for joint examination on **SEVEN (7)** calendar days' notice, then the District representative may examine the Escrow Bid Documents alone upon an **ADDITIONAL THREE (3)** calendar days' notice if a representative of the Contractor does not appear at the time set.

(3) **Subcontractor.** If a subcontractor has submitted sealed information to be included in the Escrow Bid Documentation, access to those documents may take place only in the presence of a duly designated representative of the District, the Contractor and that subcontractor. If that subcontractor fails to designate a representative or appear for joint examination on **SEVEN (7)** calendar days' notice, then the District representative and/or the Contractor may examine the Escrow Bid Documentation without that subcontractor present upon an **ADDITIONAL THREE (3)** calendar days' notice if a representative of that subcontractor does not appear at the time set.

c. The Escrow Bid Documentation will be returned to the Contractor when the District accepts Project Completion, when all of the Contractor's claims (if any) have been resolved to the District's and the Contractor's satisfaction, and when the Contractor certifies that it has no further claims against the District.

END OF DOCUMENT

DOCUMENT 00 54 55

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

This Escrow Agreement ("Escrow Agreement") is made and entered into this _____ day of _____ _____, 20___, by and between the following:

Yuba City Unified School District ("District" or "Owner"), whose address is 750 Palora Avenue, Yuba City, CA 95991, 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, the District, the Contractor, and the Escrow Agent agree as follows:

1. In lieu of the District withholding as "retention" a percentage of payments under Construction Contract No. _____ entered into between the District and the Contractor for the _____ _____Project, in the amount of _____($_____) dated, _____ _____, 20_____, (the "Contract"), the District and the Contractor have elected pursuant to Section 22300 of Public Contract Code of the State of California, which is hereby incorporated by reference, as follows:

   ☐ The Contractor shall deposit securities with the Escrow Agent as a substitute for retention earnings required to be withheld by the District pursuant to the Contract;

   or

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

   When the Contractor deposits the securities as a substitute for Contract earnings, the Escrow Agent shall notify the 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 Yuba City Unified School District, and shall designate the Contractor as beneficial owner.

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

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

4. The Contractor shall be responsible for paying all fees for the expenses incurred by the Escrow Agent in administering the Escrow Account, and all expenses of the District. The District will charge the Contractor $_____ for each of the District's deposits to the escrow account. These expenses and payment terms shall be determined by the District, the Contractor, and the 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 the Contractor and shall be subject to withdrawal by the Contractor at any time and from time-to-time without notice to the District.

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

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

8. Upon receipt of written notification from the District certifying that the Contract is final and complete, and that the Contractor has complied with all requirements and procedures applicable to the Contract, the Escrow Agent shall release to the 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. The Escrow Agent shall rely on written notifications from the District and the Contractor pursuant to Paragraphs 5 through 8, inclusive, of this Escrow Agreement and the District and the Contractor shall hold the Escrow Agent harmless from the 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 the District and on behalf of the Contractor in connection with the foregoing, and exemplars of their respective signatures are as follows:

On behalf of District:

_____
Title

_____
Name

_____
Signature

_____
Address

On behalf of Contractor:

_____
Title

_____
Name

_____
Signature

_____
Address

On behalf of Escrow Agent:

_____
Title

_____
Name

_____
Signature

_____
Address

At the time the Escrow Account is opened, the District and the Contractor shall deliver to the 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.

On behalf of District:

_____
Title

_____
Name

_____
Signature

_____
Address

On behalf of Contractor:

_____
Title

_____
Name

_____
Signature

_____
Address

On behalf of Escrow Agent:

_____
Title

_____
Name

_____
Signature

_____
Address

END OF DOCUMENT

DOCUMENT 00 54 60

HAZARDOUS MATERIALS PROCEDURES AND REQUIREMENTS

1. Summary

This document includes information applicable to hazardous materials and hazard waste abatement.

2. Notice of Hazardous Waste or Materials Conditions

a. The Contractor shall give written notice to the District, the Construction Manager, and the Architect promptly, before any of the following conditions are disturbed, and in no event later than twenty-four (24) hours after first observance, of any:

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

(2) Other material that may present a substantial danger to persons or property exposed thereto in connection with the Work at the Project Site.

b. The Contractor's written notice shall indicate whether the hazardous waste or material was shown or indicated in the Contract Documents to be within the scope of the Work, and whether the materials were brought to the site by the Contractor, its Subcontractors, suppliers, or anyone else for whom the Contractor is responsible. As used in this section the term "hazardous materials" shall include, without limitation, asbestos, lead, Polychlorinated biphenyl (PCB), petroleum and related hydrocarbons, and radioactive material.

c. In response to the Contractor's written notice, the District shall investigate the identified conditions.

d. If the District determines that conditions do not involve hazardous materials or that no change in the terms of the Contract is justified, the District shall so notify the Contractor in writing, stating reasons. If the District and the Contractor cannot agree on whether conditions justify an adjustment in the Contract Price or the Contract Time, or on the extent of any adjustment, the Contractor shall proceed with the Work as directed by the District.

e. If, after receipt of notice from the District, the Contractor does not agree to resume the Work based on a reasonable belief it is unsafe, or does not agree to resume the Work under special conditions, then the District may order that portion of the Work connected with the hazardous condition or affected area, be deleted from the Work, or performed by others, or the District may invoke its rights to terminate the Contract in whole or in part. The District will determine entitlement to or the amount or extent of an adjustment, if any, in Contract Price or Contract Time as a result of deleting such portion of the Work, or performing the Work by others.

f. If the Contractor stops Work in connection with any hazardous condition and in any area affected thereby, the Contractor shall immediately redeploy its workers, equipment, and materials, as necessary, to other portions of the Work to minimize delay and disruption.

3. Additional Warranties and Representations

a. The Contractor represents and warrants that it, its employees, and its subcontractors and their employees, shall at all times have the required levels of familiarity with the Project Site and the Work, training, and ability to comply fully with all applicable law and contract requirements for

safe and expeditious performance of the Work, including whatever training is or may be required regarding the activities to be performed (including, but not limited to, all training required to address adequately the actual or potential dangers of Contract performance).

b. The Contractor represents and warrants that it, its employees, and its subcontractors and their employees, shall at all times have and maintain in good standing any and all certifications and licenses required by applicable federal, state, and other governmental and quasi-governmental requirements applicable to the Work.

c. The Contractor represents and warrants that it has studied carefully all requirements of the Specifications regarding procedures for demolition, hazardous waste abatement, or safety practices, specified in the Contract, and prior to submitting its bid, has either (1) verified to its satisfaction that the specified procedures are adequate and sufficient to achieve the results intended by the Contract Documents, or (2) by way of approved "or equal" request or request for clarification and written Addenda, secured changes to the specified procedures sufficient to achieve the results intended by the Contract Documents. The Contractor accepts the risk that any specified procedure will result in a completed Project in full compliance with the Contract Documents.

4. Monitoring and Testing

a. The District reserves the right, in its sole discretion, to conduct air monitoring, earth monitoring, Work monitoring, and any other tests (in addition to testing required under the Agreement or applicable law), to monitor Contract requirements of safe and statutorily compliant work methods and (where applicable) safe re-entry level air standards under state and federal law upon completion of the job, and compliance of the work with periodic and final inspection by public and quasi-public entities having jurisdiction.

b. The Contractor acknowledges that the District has the right to perform, or cause to be performed, various activities and tests including, but not limited to, pre-abatement, during abatement, and post-abatement air monitoring, that the District shall have no obligation to perform said activities and tests, and that a portion of said activities and tests may take place prior to the completion of the Work by the Contractor. In the event the District elects to perform these activities and tests, the Contractor shall afford the District ample access to the Site and all areas of the Work as may be necessary for the performance of these activities and tests. The Contractor will include the potential impact of these activities or tests by the District in the Contract Price and the Scheduled Completion Date.

c. Notwithstanding the District's rights granted by this paragraph, the Contractor may retain its own industrial hygiene consultant at the Contractor's own expense and may collect samples and perform tests including, but not limited to, pre-abatement, during abatement, and post-abatement personal air monitoring, and the District reserves the right to request documentation of all such activities and tests performed by the Contractor relating to the Work and the Contractor shall provide that documentation immediately upon request, but in no event later than **THREE (3)** days upon request.

5. Compliance with Laws

a. The Contractor shall perform safe, expeditious, and orderly work in accordance with the best practices and the highest standards in the hazardous waste abatement, removal, and disposal industry, the applicable law, and the Contract Documents, including, but not limited to, all responsibilities relating to the preparation and return of waste shipment records, all requirements of the law, delivering of all requisite notices, and obtaining all necessary governmental and quasi-governmental approvals.

b. The Contractor represents that it is familiar with and shall comply with all laws applicable to the Work or completed Work including, but not limited to, all federal, state, and local laws, statutes, standards, rules, regulations, and ordinances applicable to the Work relating to:

(1) The protection of the public health, welfare and environment;

(2) Storage, handling, or use of asbestos, PCB, lead, petroleum based products or other hazardous materials;

(3) The generation, processing, treatment, storage, transport, disposal, destruction, or other management of asbestos, PCB, lead, petroleum, or hazardous waste materials or other waste materials of any kind; and

(4) The protection of environmentally sensitive areas such as wetlands and coastal areas.

6. Disposal

a. The Contractor has the sole responsibility for determining current waste storage, handling, transportation, and disposal regulations for the Project Site and for each waste disposal facility. The Contractor must comply fully at its sole cost and expense with these regulations and any applicable law. The District may, but is not obligated to, require submittals with this information for it to review consistent with the Contract Documents.

b. The Contractor shall develop and implement a system acceptable to the District to track hazardous waste from the Project Site to disposal, including appropriate "Hazardous Waste Manifests" on the EPA form, so that the District may track the volume of waste deposited in each landfill and receive from each facility a certificate of receipt.

c. The Contractor shall provide the District with the name and address of each waste disposal facility prior to any disposal, and the District shall have the right to reject any proposed disposal facility. The Contractor shall not use any disposal facility to which the District has objected. The Contractor shall document actual disposal or destruction of waste at a designated facility by completing a disposal certificate or certificate of destruction forwarding the original to the District.

7. Permits

a. Before performing any of the Work, and at such other times as may be required by applicable law, the Contractor shall deliver all requisite notices and obtain the approval of all governmental and quasi-governmental authorities having jurisdiction over the Work. The Contractor shall submit evidence satisfactory to the District that the Contractor and any disposal facility:

(1) have obtained all required permits, approvals, and the like in a timely manner both prior to commencement of the Work and thereafter as and when required by applicable law, and

(2) are in compliance with all such permits, approvals and the regulations.

For example, before commencing any work in connection with the Work involving asbestos-containing materials, or PCBs, or other hazardous materials subject to regulation, the Contractor agrees to provide the required notice of intent to renovate or demolish to the appropriate state or federal agency having jurisdiction, by certified mail, return receipt requested, or by some other method of transmittal for which a return receipt is obtained, and to send a copy of that notice to the District. The Contractor shall not conduct any Work involving asbestos-containing materials or PCBs unless the Contractor has first confirmed that the appropriate agency having jurisdiction is in receipt of the required notification. All permits, licenses, and bonds that are required by

governmental or quasi-governmental authorities, and all fees, deposits, tap fees, offsite easements, and asbestos and PCB disposal facilities expenses necessary for the prosecution of the Work, shall be procured and paid for by the Contractor. The Contractor shall give all notices and comply with the all applicable laws bearing on the conduct of the Work as drawn and specified. If the Contractor observes or reasonably should have observed that Plans and Specifications and other Contract Documents are at variance therewith, it shall be responsible for promptly notifying the District in writing of such fact. If the Contractor performs any Work contrary to applicable laws, it shall bear all costs arising therefrom.

b. In the case of any permits or notices held in the District's name or of necessity to be made in the District's name, the District shall cooperate with the Contractor in securing the permit or giving the notice, but the Contractor shall prepare for District review and execution upon approval, all necessary applications, notices, and other materials.

8. Indemnification

a. To the extent permitted by law, the indemnity obligations, defense obligations, and limitations of liability expressed in the Contract Documents apply with equal force and effect to any claims or liabilities imposed or existing by virtue of the removal, abatement, and disposal of hazardous waste. This includes, but is not limited to, liabilities connected to the selection and use of a waste disposal facility, a waste transporter, personal injury, property damage, loss of use of property, damage to the environment or natural resources, or "disposal" and "release" of materials associated with the Work (as defined in 42 U.S.C. §§ 9601 et seq.).

9. Termination

a. The District shall have an absolute right to terminate for default immediately without notice and without an opportunity to cure should the Contractor knowingly or recklessly commit a material breach of the terms of the Contract Documents, or any applicable law, on any matter involving the exposure of persons or property to hazardous waste. However, if the breach of contract exposing persons or property to hazardous waste is due solely to an ordinary, unintentional, and non-reckless failure to exercise reasonable care, then the Contract Documents' provisions related to termination for cause shall apply without modification.

END OF DOCUMENT

DOCUMENT 00 55 00

NOTICE TO PROCEED

Dated: _____, 20___

To: _____
("Contractor")

_____
(Address)

From: Governing Board ("Board") of Yuba City Unified School District ("District" or "Owner")

Re: **YCHS GYM MECHANICAL** ("Project" or "Contract")

The Contractor is hereby notified that the Contract Time under the Contract will commence to run on _____ _____, 20___. By that date, the Contractor shall start performing its obligations under the Contract Documents. In accordance with the Agreement executed by the Contractor, the Contract Time and Project Completion is _____, 20___.

The 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 Contractor's 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.

Yuba City Unified School District

BY: _____

NAME: _____

TITLE: _____

END OF DOCUMENT

DOCUMENT 00 61 14

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

KNOW ALL PERSONS BY THESE PRESENTS:

WHEREAS, the governing board ("Board") of the Yuba City 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:

YCHS GYM MECHANICAL ("Project" or "Contract"),

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

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

_____ DOLLARS

($_____), lawful money of the United States, for the payment of which sum well and truly to be made we bind ourselves, our heirs, executors, administrators, successors, and assigns jointly and severally, firmly by these presents, to:

- Perform all the work required to complete the Project; and

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

The condition of the obligation is such that, if the above bounden Principal, his/hers 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 virtue.

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 the 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 the 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.

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

Fax 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 the _____ day of _____, 20___.

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

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)

The 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 and Material Bond (100% of Contract Price)
(Note: Bidders must use this form, NOT a surety company form.)

KNOW ALL PERSONS BY THESE PRESENTS:

WHEREAS, the governing board ("Board") of the Yuba City Unified School District, (or "District") and _____ _____, ("Principal") have entered into a contract for the furnishing of all materials and labor, services and transportation, necessary, convenient, and proper to

YCHS GYM MECHANICAL ("Project" or "Contract").

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, 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 one hundred percent (100%) of the Contract price, to secure the claims to which reference is made in the Sections 9350 through 9510 and 9550 through 9566 of the Civil Code of California, and the Labor Code of California, including section 1741.

NOW, THEREFORE, 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 the Contract, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, or assigns, jointly and severally, by these presents.

The condition of this obligation is that if Principal or any of his or its subcontractors, of the heirs, executors, administrators, successors, or assigns of any, all, or either of them shall fail to pay for any labor, materials, provisions, provender, 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 such 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.

Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the Contract or to the Work to be performed thereunder shall in any way affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration, or addition to the 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 the _____ day of _____, 20___.

We declare under penalty of perjury under the laws of the state of California that the foregoing is true and correct.

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)

The 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 65 25

FINAL SETTLEMENT AGREEMENT AND RELEASE OF CLAIMS

THIS FINAL SETTLEMENT AGREEMENT AND RELEASE OF CLAIMS ("Final Settlement") is made and entered into this _____ day of _____, 20___ by and between:

Yuba City Unified School District ("District") and

_____ ("Contractor"), whose

place of business is _____.

The District and the Contractor entered into PROJECT/CONTRACT NO.: **22-519-03**.

("Contract" or "Project") in the County of _____, California.

The Work under the Contract has been completed.

NOW, THEREFORE, it is mutually agreed between the District and the Contractor as follows:

AGREEMENT

1. **Total Payable.** The District shall pay the Contractor as detailed below:

(Original Contract Sum $_____ For information only)

Modified Contract Sum	$_____	
– Payments to Date	$_____	(subtract)
– Liquidated Damages	$_____	(subtract)
– [Other _____]	$_____	(subtract)
= Payment Due Contractor	**$_____**	**("Total Payable")**

Subject to the provisions hereof, the District shall forthwith pay to the Contractor the Total Payable amount, less any amounts represented by any notice to withhold funds on file with the District as of the date of such payment.

2. **No Claims or Disputes.** The Contractor acknowledges and hereby agrees that there are no unresolved or outstanding Claims or Disputes (as defined in the Contract Documents) against the District arising from the performance of work under the Contract, except for the claims described in the "Disputed Claims" section herein and the obligations described in the "Continuing Obligations" section herein. It is the intention of the parties in executing this Final Settlement that this Final Settlement shall be effective as a full, final and general release of all claims, demands, actions, causes of action, obligations, costs, expenses, damages, losses and liabilities of the Contractor against the District, all its respective agents, employees, inspectors, assignees and transferees except for the claims described in the "Disputed Claims" section herein and the obligations described in the "Continuing Obligations" section herein.

3. **Disputed Claims.** The following claims are disputed (hereinafter, the "Disputed Claims") and are specifically excluded from the operation of this Final Settlement:

Claim No. Description of Claim Amount of Claim Date Claim Submitted

[INSERT INFORMATION, INCLUDING ATTACHMENTS IF NECESSARY]

4. **Release.** Consistent with California Public Contract Code section 7100, the Contractor hereby agrees that, in consideration of the payment set forth in the "Total Payable" section herein, the Contractor hereby releases and forever discharges the District, all its agents, employees, inspectors, assignees, and transferees from any and all liability, claims, demands, actions, or causes of action of whatever kind or nature arising out of or in any way concerned with the Work under the Contract.

5. **Continuing Obligations.** Guarantees and warranties for the Work, and any other continuing obligation of the Contractor, shall remain in full force and effect as specified in the Contract Documents.

6. **Contract Indemnity.** To the furthest extent permitted by California law, the Contractor shall defend, indemnify, and hold harmless the District, its agents, representatives, officers, consultants, employees, trustees, and volunteers (the "indemnified parties") from any and all losses, liabilities, claims, suits, and actions of any kind, nature, and description, including, but not limited to, attorneys' fees and costs, directly or indirectly arising out of, connected with, or resulting from the performance of the Contract unless caused wholly by the sole negligence or willful misconduct of the indemnified parties.

7. **Waiver.** The Contractor hereby waives the provisions of California Civil Code section 1542 which provides as follows:

> **A GENERAL RELEASE DOES NOT EXTEND TO CLAIMS THAT THE CREDITOR OR RELEASING PARTY DOES NOT KNOW OR SUSPECT TO EXIST IN HIS OR HER FAVOR AT THE TIME OF EXECUTING THE RELEASE AND THAT, IF KNOWN BY HIM OR HER, WOULD HAVE MATERIALLY AFFECTED HIS OR HER SETTLEMENT WITH THE DEBTOR OR RELEASED PARTY.**

_____ _____

Contractor Initials District Initials

8. **Survivability.** The provisions of this Final Settlement are contractual in nature and not mere recitals and shall be considered independent and severable. If any such provision or any part thereof shall be at any time held invalid in whole or in part under any federal, state, county, municipal, or other law, ruling, or regulations, then such provision, or part thereof, shall remain in force and effect to the extent permitted by law, and the remaining provisions of this Final Settlement shall also remain in full force and effect, and shall be enforceable.

9. **Reservation of Rights.** All rights of the District shall survive completion of the Work or termination of the Contract, and execution of this Release.

*** * * CAUTION: THIS IS A RELEASE - READ BEFORE EXECUTING * * ***

Accepted and agreed on the date indicated below:

Dated: _____, 20___	Dated: _____, 20___
YUBA CITY UNIFIED SCHOOL DISTRICT	**CONTRACTOR**
By: _____	By: _____
Print Name: _____	Print Name: _____
Print Title: _____	Print Title: _____

END OF DOCUMENT

DOCUMENT 00 65 36

WARRANTY AND GUARANTEE FORM

1. _____("Contractor")

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

which the Contractor has installed for the Yuba City Unified School District ("District")

for the following project:_____ ("Project" or "Contract") 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. The 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 _____ **YEAR(S)** 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 the Contractor fails to comply with the above-mentioned conditions within a reasonable period of time, as determined by the District, but not later than **SEVEN (7)** calendar days after being notified in writing by the District, the Contractor authorizes the District to proceed to repair or replace the defective Work at the expense of the Contractor. The 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: _____

PHONE NO.: _____

EMAIL: _____

Date: _____

Legal Name of Contractor:_____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

DOCUMENT 00 70 00

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GENERAL CONDITIONS

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 the Contractor may bill its time, materials, and other items in the identical structure as a Change Order.

1.1.3. Approval, Approved, and/or Accepted: Refers 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.

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 since the preceding monthly submittal.

1.1.6. Bidder: A contractor who intends to provide 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 to the satisfaction of the District, including all punch list items. Final DSA approval of the Project is not required for Completion.

1.1.9. Construction Change Directive: 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 Construction Change Directive is NOT a Construction Change Document (which is defined above as a Change Order that DSA must approve).**

1.1.10. 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 the District.

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

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

1.1.12.1. Invitation to Bid

1.1.12.2. Instructions to Bidders

1.1.12.3. Bid Form

1.1.12.4. Bid Bond (Security)

1.1.12.5. Designated Subcontractors List

1.1.12.6. Certification: Site-Visit

1.1.12.7. Noncollusion Declaration

1.1.12.8. Certification: Iran Contracting Act

1.1.12.9. Certification: Worker's Compensation

1.1.12.10. Certification: Prevailing Wage and Related Labor Requirements

1.1.12.11. Certification: Disabled Veteran's Business Enterprise Participation

1.1.12.12. Certification: Drug-Free Workplace

1.1.12.13. Certification: Tobacco-Free Environment

1.1.12.14. Certification: Hazardous Materials

1.1.12.15. Lead-Based Materials Certification

1.1.12.16. Certification: Imported Materials

1.1.12.17. Certification: Criminal Background Investigation/Fingerprinting

1.1.12.18. Certification: Roofing Contract Financial Interest

1.1.12.19. Notice of Award

1.1.12.20. Agreement

1.1.12.21. Escrow of Bid Documentation (if applicable)

1.1.12.22. Optional Escrow Agreement for Security Deposits In Lieu of Retention

1.1.12.23. Storm Water Pollution Prevention Plan (if applicable)

1.1.12.24. Hazardous Materials Procedures and Requirements

1.1.12.25. Notice to Proceed

1.1.12.26. Performance Bond

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

1.1.12.28. District Contract Forms (if applicable)

1.1.12.29. District Closeout Forms (if applicable)

1.1.12.30. Final Settlement Agreement and Release of Claims

1.1.12.31. Warranty and Guarantee Form

1.1.12.32. General Conditions

1.1.12.33. Special Conditions

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

1.1.12.35. Addenda to any of the above documents

1.1.12.36. Schedules if approved in writing by the District

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

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

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

1.1.15. Contractor: The person or persons identified in the Agreement as contracting to perform the Work, or the legal representative of such person(s).

1.1.16. 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.

1.1.17. Day(s): Unless otherwise designated, day(s) means calendar day(s).

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 the Contractor prepares a price for the scope of work, the Contractor performs on a time and materials basis.

1.1.22. Premises: The real property owned by the District on which the Project Site is located.

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 the 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.

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 Project Manager shall refer to the District.

1.1.28. 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.

1.1.29. 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.

1.1.30. Request for Substitution: A request by the 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.

1.1.31. 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").

1.1.32. Safety Plan: The Contractor's safety plan specifically adapted for the Project. The Contractor's Safety Plan shall comply with all provisions regarding Project safety, including all applicable provisions in these General Conditions.

1.1.33. 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.

1.1.34. 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.

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

1.1.36. Specifications: That portion of the Contract Documents, Division 1 through Division 49, 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.

1.1.37. 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.

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

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

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

1.1.41. 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

The Contract is subject to all provisions of the Constitution and laws of California and the United States, governing, controlling, or affecting the District, or the property, funds, operations, or powers of the 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 the District, either before or after execution of the Contract, shall affect or modify any of the terms or obligations contained in the Contract Documents.

1.4. No Assignment

The 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 the District's prior written consent shall be null and void. Any assignment of money due or to become 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 the District in accordance with the Contract. The 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. Notice And Service Thereof

1.5.1. 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. Notice shall be served and considered effective if given in one of the following manners:

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

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

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

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

1.6. No Waiver

The failure of the 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.

1.7. Substitutions for Specified Items

See Special Conditions.

1.8. Materials and Work

1.8.1. Except as otherwise stated in the Contract, the 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.

1.8.2. 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.

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

1.8.4. 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 the Drawings, nor mentioned in the Specifications, that can legitimately and reasonably be inferred to belong to the Work described, or be necessary in good practice to provide a complete assembly or system, shall be furnished as though itemized 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.

1.8.5. The Contractor shall, after award of Contract by the 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. The Contractor shall, upon demand from the District, present documentary evidence showing that orders have been placed.

1.8.6. The 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 the Contractor or withheld from payment(s) to the Contractor.

1.8.7. The Contractor warrants good title to all material, supplies, and equipment installed or incorporated in the Work and agrees upon Completion of all Work to deliver the Site to the District, together with all improvements and appurtenances constructed or placed thereon by it, and free from any claims, liens, or charges. The 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 the Contractor may install metering devices or other equipment of utility companies or of a 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, the Contractor shall advise the District as to the owner thereof.

1.8.8. Nothing contained in this Article, however, shall defeat or impair the rights of persons furnishing materials or labor under any bond given by the 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 the Contractor in hands of the 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.

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

1.8.10. The 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

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

2.1.2. The District may, at any time,

2.1.2.1. 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

2.1.2.2. 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.

2.1.3. **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, take over 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. The Architect shall have the authority to act on behalf of the District to the extent expressly provided in the Contract Documents and to the extent determined by the District to, among other things, observe the progress and quality of the Work on behalf of the District. The Architect shall have authority to reject materials, workmanship, and/or the Work whenever rejection may be necessary, in the Architect's reasonable opinion, to insure the proper execution of the Contract.

3.2. The 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.

3.3. The Architect shall have all authority and responsibility established by law, including title 24 of the California Code of Regulations.

3.4. The Contractor shall provide the District and the Construction Manager with a copy of all written communication between the Contractor and the Architect at the same time as that communication is made to the 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 the Contractor and/or the 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. The 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. The 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 the 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. The 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 the 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. The Contractor shall furnish the Project Inspector(s) reasonable opportunities for obtaining such information as may be necessary to keep the Project Inspector(s) fully informed respecting progress and manner of work and character of materials. Inspection of Work shall not relieve the Contractor from the obligation to fulfill the Contract. The 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. The Contractor shall instruct its Subcontractors and employees accordingly.

5.1.3. If the 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.

5.2. 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. 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.

5.2.3. 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.

5.2.4. 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.

5.2.5. 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 or requests the Inspector to perform inspections off Site, costs of any inspections required outside regular working hours 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

The 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, the 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. The 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 the Contractor or any of the Contractor's Subcontractors, agents or employees. The 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. The Contractor, its Subcontractors, agents, and its employees shall not be entitled to any rights or privileges of District employees. The 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, the 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, the 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, the Contractor shall give written notice to the 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 the District, unless the Contractor's project manager and/or construction superintendent proves to be unsatisfactory to the Contractor, the District, any of the District's employees, agents, the Construction Manager, or the Architect, in which case, the Contractor shall notify the District in writing. The District retains the right to reasonably refuse the Contractor's replacement personnel. The Contractor's project manager and construction superintendent shall each represent the Contractor, and all directions given to the Contractor's project manager and/or construction superintendent shall be as binding as if given to the Contractor.

6.2.4. The Contractor shall give efficient supervision to the Work, using its best skill and attention. The Contractor shall carefully study and compare all Contract Documents, Drawings, Specifications, and other instructions and shall at once report to the District, the Construction Manager, and the Architect any error, inconsistency, or omission that the Contractor or its employees and Subcontractors may discover, in writing, with a copy to the 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 Project 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 the Work properly fit at no additional cost to the 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 the 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. The 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 the Contractor to ensure compliance with this requirement. The District may require the Contractor to permanently remove unfit persons from the Project Site.

6.3.2. Any person in the employ of the Contractor or Subcontractor(s) whom the 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 the District.

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

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

6.3.5. **Compliance with Immigration Reform and Control Act of 1986.** As required by law, the 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. Personnel

6.4.1. All persons working for the Contractor and Subcontractor(s) shall refrain from using profane or vulgar language, or any other language that is inappropriate on the job 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 contract 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 estimator shall not be changed without the written consent of the District unless the estimator ceases to be employed by the Contractor. 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. The scheduler shall not be changed without the written consent of the District unless the scheduler ceases to be employed by the Contractor.

6.4.5. The Contractor shall at all times enforce strict discipline and good order among the 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 the 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. The 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. Purchase of Materials and Equipment

6.5.1. **Duty to Promptly Obtain Materials and Equipment.** 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 the District to assure that there will be no delays.

6.5.2. **Off-Site Storage of Materials and Equipment.** The Contractor shall not store materials and/or equipment off Site without first obtaining the District's express, written consent. If the Contractor receives the District's consent to store materials and/or equipment off Site ("Stored Materials"), the Contractor shall comply with all of the following:

6.5.2.1. **Property of Others Insurance.** The 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 the Contractor and the 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 the District. If approved in advance by the District, this required insurance may be obtained by an "Employee Theft Protection Insurance Policy" or an "Employee Theft Protection Bond."

6.5.2.2. Payment for Stored Materials. The District shall only make payment to the Contractor for Stored Materials if (1) agreed upon in advance, in a writing signed by the District, (2) as required by section 9203 of the Public Contract Code, the Stored Materials are stored subject to or under the control of the District and unused, and (3) provided that the Contractor submits an itemized list of all Stored Materials with the Contractor's Application for Payment. The Contractor's itemized list of all Stored Materials shall be supported by all of the following:

6.5.2.2.1. 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

6.5.2.2.2. Verified invoices for the Stored Materials; and

6.5.2.2.3. 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.

6.6. Documents on Work

6.6.1. The 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 titles 19 and 24 of the California Code of Regulations, the specified edition(s) of the Uniform Building 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 the District, the Construction Manager, the Architect, the Architect's representatives, the Project Inspector(s), and all authorities having jurisdiction. The 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.) The 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. The Contractor shall coordinate with the Architect and the Construction Manager and shall submit its verified report(s) according to the requirements of title 24.

6.6.2. Daily Job Reports.

6.6.2.1. The 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:

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

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

6.6.2.1.3. The weather conditions on that day.

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

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

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

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

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

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

6.7. Preservation of Records

The District shall have the right to examine and audit all Daily Job Reports or other Project records of the 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. The 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, the Contractor shall provide any records requested by any governmental agency, if available, after the time set forth above.

6.8. Integration of Work

6.8.1. The 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 the District and/or the Architect may direct.

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

6.8.3. The 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 the District.

6.9. Obtaining of Permits and Licenses

6.9.1. The Contractor shall secure and pay for all permits, licenses, and certificates as indicated in the Special Conditions.

6.10. Work to Comply with Applicable Laws and Regulations

6.10.1. The 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 the Contractor observes that Drawings and Specifications are at variance therewith, or should the Contractor become aware of the development of conditions not covered by the Contract Documents that will result in finished Work being at variance therewith, the Contractor shall promptly notify the District in writing and any changes deemed necessary by the District shall be made as provided in the Contract for changes in the Work.

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

6.10.1.2. National Board of Fire Underwriters' Regulations

6.10.1.3. Uniform Building Code, latest addition, and the California Code of Regulations, title 24, including amendments

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

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

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

6.10.1.7. Americans with Disabilities Act

6.10.1.8. Education Code of the State of California

6.10.1.9. Government Code of the State of California

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

6.10.1.11. Public Contract Code of the State of California

6.10.1.12. California Art Preservation Act

6.10.1.13. U. S. Copyright Act

6.10.1.14. U. S. Visual Artists Rights Act

6.10.2. The 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 sections 21000 et. seq.)

6.10.3. If the 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, the Contractor shall bear all costs arising therefrom.

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

6.11. Safety/Protection of Persons and Property

6.11.1. The 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.

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

6.11.3. 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.

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

6.11.5. The 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.

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

6.11.7. The 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. The 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.

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

6.11.9. The 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 the person so designated shall be reported to the District by the Contractor.

6.11.10. The 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, the Contractor shall correct such violation promptly.

6.11.11. **Storm Water.** The 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.

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

6.11.13. 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. However, the District reserves the right to designate certain items of value that shall be turned over to the District unless otherwise directed by the District.

6.11.14. 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.

6.11.15. The 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.

6.11.16. The Contractor shall protect and preserve the Work from all damage or accident, providing temporary roofs, window and door coverings, boxing, or other construction as required by the Architect. The Contractor shall be responsible for existing structures, walks, roads, trees, landscaping, 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.

6.11.17. The 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.

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

6.11.19. The Contractor, the Contractor's employees, Subcontractors, Subcontractors' employees, or any person associated with the Work shall conduct themselves in a manner appropriate for a school site. No verbal or physical contact with neighbors, students, and faculty, profanity, or inappropriate attire or behavior will be permitted. The District may require the Contractor to permanently remove noncomplying persons from the Project Site.

6.11.20. The 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, the Contractor shall have a civil engineer, registered as a professional engineer in California, replace them at no cost to the District.

6.11.21. 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, the 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.

6.12. Working Evenings and Weekends

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

6.13. Cleaning Up

6.13.1. 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 the District. Dust barriers shall be provided to isolate dust and dirt from construction operations. At Completion of the Work and portions thereof, the 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.

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

6.13.3. 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.

6.13.4. 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 the District may withhold those amounts from payment(s) to the Contractor.

7. SUBCONTRACTORS

7.1. The 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. The Contractor agrees to bind every Subcontractor by terms of the Contract as far as those terms are applicable to Subcontractor's work. If the Contractor shall subcontract any part of the Contract, the Contractor shall be as fully responsible to the 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 the 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. The District's consent to, or approval of, or failure to object to, any Subcontractor under the Contract shall not in any way relieve the Contractor of any obligations under the Contract and no such consent shall be deemed to waive any provisions of the Contract.

7.5. The Contractor is directed to familiarize itself with sections 4100 through 4114 of the Public Contract Code of the State of California, as regards subletting and subcontracting, and to comply with all applicable requirements therein. In addition, the Contractor is directed to familiarize itself with sections 1720 through 1861 of the Labor Code of the State of California, as regards the payment of prevailing wages and related issues, and to 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/her 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. The Contractor is solely responsible for settling any differences between the Contractor and its Subcontractor(s) or between Subcontractors.

7.9. The 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. The District reserves the right to let other contracts, and/or to perform work with its own forces, in connection with the Project. The 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 the Contractor's Work with the work of other contractors.

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

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

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

8.6. Nothing herein contained shall be interpreted as granting to the 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. The Contractor shall not cause any unnecessary hindrance or delay to the use and/or school operation(s) of the Premises and/or to the 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 the Contractor's Contract, the 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 the 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 the Contractor observes that Drawings and Specifications are in conflict, the Contractor shall promptly notify the District and the 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 the District with the functionally complete and operable Project described in the Drawings and Specifications. In case of ambiguity, conflict, or lack of information, the 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. The Contractor shall bear all expense of correcting work done contrary to said laws, ordinances, rules, and regulations.

9.8. All copies of the Drawings, Designs, Specifications, and copies of other incidental architectural and engineering work, or copies of other Contract Documents furnished by the District, are the property of the District. They are not to be used by the Contractor in other work and, with the exception of signed sets of Contract Documents, are to be returned to the District on request at Completion of Work, or may be used by the District as it may require without any additional costs to the 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. The 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

The Contractor's submittals shall comply with the provisions and requirements of the Specifications including, without limitation Submittals.

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), the 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. The 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 the 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. The 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 the 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 the 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. Overhead and profit;
10.1.1.3.1.2. Supervision;
10.1.1.3.1.3. General conditions;
10.1.1.3.1.4. Layout;
10.1.1.3.1.5. Mobilization;
10.1.1.3.1.6. Submittals;
10.1.1.3.1.7. Bonds and insurance;
10.1.1.3.1.8. Closeout documentation;
10.1.1.3.1.9. Demolition;
10.1.1.3.1.10. Installation;
10.1.1.3.1.11. Rough-in;
10.1.1.3.1.12. Finishes;
10.1.1.3.1.13. Testing;
10.1.1.3.1.14. Punch List and acceptance.

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 each building;

10.1.1.3.2.3. 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. 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 Cost Breakdown, shall be paid by the District in equal installments, based on percentage complete, with the disbursement of Progress Payments and the Final Payment.

10.1.1.3.6. The Contractor shall certify that the preliminary schedule of values as submitted to the District is accurate and reflects the costs as developed in preparing the 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), the 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.

10.1.1.4. **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. 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. All provisions regarding Project safety, including all applicable provisions in these General Conditions.

10.1.1.4.3. Contractor's Safety Plan shall be prepared in both English and in the predominate language(s) of the Contractor's and its Subcontractors' employees.

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

10.1.2. The Contractor must provide all schedules both in hard copy and electronically, in a format (e.g., Microsoft Project or Primavera) 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 the Contractor can rely on them as a basis for payment.

10.2. Monthly Progress Schedule(s)

10.2.1. The 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 the District approval of the Monthly Progress Schedule shall be the same as the process for approval of the Construction Schedule.

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

10.3. Material Safety Data Sheets (MSDS)

The 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

The 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.

11. SITE ACCESS, CONDITIONS AND REQUIREMENTS

11.1. Site Investigation

Before bidding on the Work, the 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, the 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 the 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 the Contractor may not rely thereon. By submitting its bid, the Contractor acknowledges that it made visual examination of the Site and made whatever tests the Contractor deems appropriate to determine underground condition of soil.

11.2.2. The Contractor agrees that no claim against the District will be made by the Contractor for damages and hereby waives any rights to damages if, during progress of Work, the Contractor encounters subsurface or latent conditions at the 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

The District and its representatives shall at all times have access to Work wherever it is in preparation or progress, including storage and fabrication. The Contractor shall provide safe and proper facilities for access so that the 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 the Contractor at its expense. This Work shall be done by a qualified, California-registered civil engineer approved in writing by the 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. The 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. The District shall not be liable for any claim for allowances because of the Contractor's error or negligence in acquainting itself with the conditions at the Site.

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

11.5. Utilities

Utilities shall be provided as indicated in the Specifications.

11.6. Sanitary Facilities

Sanitary facilities shall be provided as indicated in the Specifications.

11.7. Surveys

The 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

The Contractor, except in an emergency, shall contact the appropriate regional notification center at least two (2) days prior to commencing any excavation if the excavation will be conducted in an area 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 the 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, the District assumes the responsibility for removal, relocation, and protection of main or trunk utility lines and facilities located on the construction Site at the time of commencement of construction under the Contract with respect to any such utility facilities that are not identified in the Plans and Specifications. The Contractor shall not be assessed for liquidated damages for delay in completion of the Project caused by failure of the 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 the District shall not be considered exact, but approximate within reasonable margin and shall not relieve the Contractor of responsibilities to exercise reasonable care nor costs of repair due to the Contractor's failure to do so. The District shall compensate the Contractor for the costs of locating, repairing damage not due to the failure of the 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 the Contractor for any other delays in completion of the Work. Nothing in this Article shall be deemed to require the 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 the Contractor, while performing Work, discovers utility facilities not identified by the District in Contract Plans and Specifications, the 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

The 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 the Contractor to promptly notify the District in writing, pursuant to the applicable provisions of these General Conditions, shall constitute the Contractor's waiver of any claim for damages or delay incurred as a result of the condition(s).

11.11. Hazardous Materials

The Contractor shall comply with all provisions and requirements of the Contract Documents related to hazardous materials including, without limitation, Hazardous Materials Procedures and Requirements.

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 Twenty-Five Thousand Dollars ($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 the 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 the Contractor complies with the notice and PCO provisions of the Contract Documents. The Contractor's failure to submit a proposed change order pursuant to the terms of the Contract Documents shall be deemed a waiver of the 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 the Contractor and/or its Subcontractor(s) shall be in the amounts and include the provisions set forth herein.

13.1.1. Commercial General Liability and Automobile Liability Insurance

13.1.1.1. The Contractor shall procure and maintain, during the life of the Contract, Commercial General Liability Insurance and Automobile Liability Insurance that shall protect the Contractor, the District, the 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. The 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 the Contractor shall procure and maintain these coverages separately.

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

13.1.2. Umbrella Liability Insurance

13.1.2.1. The Contractor may procure and maintain, during the life of the Contract, an Umbrella Liability Insurance Policy to meet the policy limit requirements of the required policies if the Contractor's underlying policy limits are less than required.

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. Any Umbrella Liability Insurance Policy shall protect the Contractor, the District, the State, Construction Manager(s), Project Manager(s), and Architect(s) in amounts and including the provisions as set forth in the Supplementary Conditions (if any) and/or Special Conditions, and that complies with all requirements for Commercial General Liability and Automobile Liability and Employers' Liability Insurance.

13.1.3. Subcontractor(s)

The 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 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. The 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. The 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 the 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, the 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. Builder's Risk Insurance: Builder's Risk "All Risk" Insurance.

The Contractor 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. 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, theft, sonic disturbance, earthquake, flood, 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. <u>Proof of Carriage of Insurance and Other Requirements: Endorsements and Certificates</u>

13.1.6.1. The Contractor shall not commence Work nor shall it allow any Subcontractor to commence Work under the Contract, until the Contractor and its Subcontractor(s) have procured all required insurance and the 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.

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

13.1.6.2.1. A clause stating:

13.1.6.2.1.1. "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."

13.1.6.2.1.2. In lieu of receiving an endorsement with this clause, the District may, at its sole discretion, accept written notification from the 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.

13.1.6.2.2. 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.

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

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

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

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

13.1.6.7. Unless otherwise stated in the Special Conditions, all of the Contractor's insurance shall be with **admitted** insurance companies with an A.M. Best rating of no less than **A: VII.**

13.1.6.8. 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.

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

13.1.7. 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	Combined Single Limit	$1,000,000 per occurrence; $2,000,000 aggregate
	Product Liability and Completed Operations	$1,000,000 per occurrence; $2,000,000 aggregate
Automobile Liability – Any Auto	Combined Single Limit	$1,000,000 per occurrence; $2,000,000 aggregate
Workers Compensation		Statutory limits pursuant to State law
Employers' Liability		$2,000,000
Builder's Risk (Course of Construction)		Issued for the value and scope of Work indicated herein.

13.2. Contract Security – Bonds

13.2.1. The 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 the 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. The Contractor shall obtain and preserve for the benefit of the District, manufacturer's warranties on materials, fixtures, and equipment incorporated into the Work.

14.1.2. In addition to guarantees required elsewhere, the Contractor shall, and hereby does guarantee and warrant all Work against all defects for a period of **TWO (2)** years 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, the 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 **TWO (2)** year period from date of Completion as defined above without expense whatsoever to the District. In the event of failure of the Contractor and/or Surety to commence and pursue with diligence said replacements or repairs within **SEVEN (7)** days after being notified in writing, the Contractor and Surety hereby acknowledge and agree that the District is authorized to proceed to have defects repaired and made good at expense of the Contractor and/or Surety who hereby agree to pay costs and charges therefore immediately on demand.

14.1.4. If, in the opinion of the District, defective work creates a dangerous condition or requires immediate correction or attention to prevent further loss to the District or to prevent interruption of operations of the District, the District will attempt to give the notice required above. If the Contractor or Surety cannot be contacted or neither complies with the District's request for correction within a reasonable time as determined by the District, the 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 the 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. The Contractor shall furnish to the District all appropriate guarantee or warranty certificates as indicated in the Specifications or upon request by the District.

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

14.2. Indemnity

14.2.1. To the furthest extent permitted by California law, the 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 the 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 the 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 any failure or alleged failure by the 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.

14.2.2. The 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 the 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 the 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 the 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, the 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 the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the 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 the 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

15.1.1. The District may issue a Notice to Proceed as indicated in the Instructions to Bidders.

15.2. Hours of Work

15.2.1. Sufficient Forces

The Contractor and Subcontractors shall continuously furnish sufficient forces to ensure the performance of the Work in accordance with the Construction Schedule.

15.2.2. Performance During Working Hours

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

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, the 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. The 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 the Contractor commences Work without insurance and bonds, all Work is performed at the Contractor's peril and shall not be compensable until and unless the Contractor secures bonds and insurance pursuant to the terms of the Contract Documents and subject to the District's claim for damages.

15.4. Schedule

The Contractor shall provide to the 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, the Contractor shall notify the District pursuant to the claims provisions in these General Conditions of any anticipated delay and its cause.

16.1.2. The Contractor shall, within **FIVE (5)** calendar days of any delay impacting the critical path in completing the Work, notify the District in writing of the causes of the delay including documentation and facts explaining the delay.

16.1.3. Any request by the 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. 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. 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.)

16.1.4.3. A recovery schedule must be submitted.

16.1.5. The 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 the Contractor has timely submitted the 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, 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. The Contractor's failure to request adjustment(s) of the Contract Time in strict conformity with applicable provisions of the Contract Documents shall be deemed the Contractor's waiver of its right to assert a claim for a delay.

16.2. <u>Excusable and Compensable Delay(s)</u>

16.2.1. The Contractor is **<u>not</u>** entitled to additional compensation for any delay, even a delay caused by Adverse Weather or an Excusable Delay, unless **<u>all</u>** of the following conditions are met:

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 the District and the Contractor; and

16.2.1.4. The Contractor complies with the claims procedure 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 is not concurrent with a Contractor-caused delay or other type of Excusable Delay.

16.3. District Delay(s)

16.3.1. If the Contractor is delayed by the District or anyone employed by it and granted an extension of time, or if the Contractor is delayed and the District is held responsible for such delay, the Contractor and the District agree that it is impractical and infeasible to determine the amount of actual damage suffered by the Contractor as a result of such delay. Such damages include, but are not limited to, extended home and field office overhead, impairment of bonding capacity, lost opportunity, and all other damages or claims, regardless of tier, attributable, or claimed to be attributable to any such delay. Accordingly, in such an instance, it is agreed that the District will pay to the Contractor as fixed and liquidated damages, and not as a penalty, the sum set forth in the Special Conditions for each calendar day of delay beyond the Contract Time. **This subsection is only applicable and enforceable if there is a specific amount indicated in the Special Conditions.**

16.4. Excusable and Non-Compensable Delay(s)

16.4.1. An "Excusable Delay" shall mean an interruption of the Work beyond the reasonable control of the Contractor and that:

16.4.1.1. Could have not been avoided by the Contractor exercising care, prudence, foresight, and diligence, and

16.4.1.2. Actually extended the most current Project Completion date.

16.4.2. 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.

16.4.3. 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; quarantine restrictions; strikes; lockouts; fuel shortages; freight embargoes; and Adverse Weather that satisfies the requirements herein.

16.4.4. The 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. The 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. The Contractor is not entitled to make

a claim for damages or delays or an Excusable Delay arising from the review of the 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.

16.4.5. Computation of Time / Adverse Weather

16.4.5.1. The Contractor will only be allowed a time extension for Adverse Weather conditions if requested by the Contractor within five (5) calendar days of the Adverse Weather event, and only if **all** of the following conditions are met – thereby making the resulting delay an Excusable Delay.

16.4.5.1.1. The weather conditions constitute Adverse Weather, as defined herein and further specified in the Special Conditions;

16.4.5.1.2. The 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;

16.4.5.1.3. The Contractor's crew is dismissed as a result of the Adverse Weather; and

16.4.5.1.4. The number of days of delay for the month exceed those indicated in the Special Conditions.

16.4.5.2. A day-for-day extension will only be allowed for those days in excess of those indicated in the Special Conditions.

16.4.5.3. 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.

16.4.5.4. 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.

16.5. Unexcused Delay(s) – Liquidated Damages

16.5.1. The Contractor and the 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 to the 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. The Contractor and its Surety shall be liable for the amount thereof pursuant to Government Code section 53069.85.

16.5.2. The Contractor shall not forfeit 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 Construction Change Directive, or a written Force Account Directive authorized by the District as herein provided. The 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 Construction Change Directive, or a written Force Account Directive.

17.1.2. 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.

17.1.3. No extension of time for performance of the Work shall be allowed hereunder unless claim for such extension is made at the time changes in the Work are ordered, and such time duly adjusted in writing in the Change Order, Construction Change Directive, 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.

17.1.4. The Contractor shall perform immediately all work that has been authorized by a fully executed Change Order, Construction Change Directive, or Force Account Directive. The Contractor shall be fully responsible for any and all delays and/or expenses caused by the Contractor's failure to expeditiously perform this Work.

17.1.5. 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 the Contractor and the District and be subject to the monetary limitations set forth in Public Contract Code section 20118.4. In the event that the Contractor proceeds with any change in Work without a Change Order executed by the District, Construction Change Directive, or Force Account Directive, the Contractor waives any claim of additional compensation or time for that additional work.

17.1.6. The Contractor understands, acknowledges, and agrees that the reason for District authorization is so that the 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.

17.1.7. No payments will be made, nor will the District accept proposed change orders until the Contractor has complied with all the requirements of the Escrow of Bid Documentation document.

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, Construction Change Directive, or by the 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 of 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. Construction Change Directives / Unilateral Change Orders

17.4.1. A Construction Change Directive (or 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 and the Architect, directing a change in the Work. The District may, as provided by law, by Construction Change Directive and without invalidating the Contract, order changes in the Work consisting of additions, deletions, or other revisions. If all or a portion of the Project is being funded by funds requiring approval by the State Allocation Board (SAB), these revisions may be subject to compensation once approval of same is received and funded by the SAB, and funds are released by the Office of Public School Construction (OPSC). Any dispute as to the sum of the Construction Change Directive or timing of payment shall be resolved pursuant to the Payment and Claims provisions herein. **A Construction Change Directive 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 Construction Change Directive 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. The 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 the 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, the 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. The 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. The Contractor shall notify the 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. The Contractor will not be compensated for force account work in the event that the Contractor fails to timely notify the District regarding the commencement of force account work, or exceeding the force account budget.

17.5.6. The 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. The 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 the Contractor for its records. The District will not sign, nor will the Contractor receive compensation for work the District cannot verify. The 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 the Contractor and the 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 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 the Contractor to provide the cost breakdowns required herein. The Contractor shall not be entitled to any additional compensation for preparing a response to a Price Request, whether ultimately accepted or not.

17.7. Proposed Change Order

17.7.1. **Definition of Proposed Change Order.** A Proposed Change Order ("PCO") is 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.

17.7.2. **Changes in Contract Price.** A PCO shall include breakdowns pursuant to the provisions herein to validate any change in Contract Price.

17.7.3. **Changes in Time.** A PCO shall also include any changes in time required to complete the Project. Any additional time requested shall not be the number of days to make the proposed change, but must be based upon the impact to the Construction Schedule as defined in the Contract Documents. If the Contractor fails to request a time extension in a PCO, then the Contractor is thereafter precluded from requesting time and/or claiming a delay.

17.7.4. **Unknown and/or Unforeseen Conditions.** If the Contractor submits a PCO requesting an increase in Contract Price and/or Contract Time that is based at least partially on the Contractor's assertion that the Contractor has encountered unknown and/or unforeseen condition(s) on the Project, then the 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.** The Contractor shall submit its PCO within five (5) days of the date the 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.

17.8. Format for Proposed Change

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 SUBCONTRACTOR PERFORMED WORK

Proposed Change Order Submitted By: _____ ("Contractor")

Project Name and Contract Number: _____

This Proposed Change Order Provides for the following modifications to the Contract Documents (attach pages as necessary) supported by the documentation attached hereto: _____
_____
_____

	SUBCONTRACTOR 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 Subcontractors or all labor performed by the Subcontractor or Subcontractor's Subcontractor(s) (i.e., all "lower-tier" Subcontractor(s)).		
(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)	**Subcontractor's Overhead and Profit Charge** 1. This shall be no more than five percent (5%) 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)	**Subtotal (F+G)**		
(I)	**Contractor's Overhead, Profit, Bond and Insurance** 1. This shall be no more than six percent (6%) of **Item (H)**. 2. This shall be the total mark-up permitted for the Contractor.		
(J)	**Subtotal (H+I)**		
(K)	**Time**	**_____ Days**	
(L)	**Contractor's Home Office Overhead** This shall be no more than $200 times the number of days of Item (K) (i.e., not to exceed $200/day)		
(M)	**TOTAL (J+L)**		

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 which have no basis in fact or which the Contractor knows are false are at the sole risk of the 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.

For Contractor:

_____
Signature

_____
Date

_____
Title

_____
Name

FORMAT FOR PROPOSED CHANGE FOR CONTRACTOR PERFORMED WORK

Proposed Change Order Submitted By: _____ ("Contractor")

Project Name and Contract Number: _____

This Proposed Change Order Provides for the following modifications to the Contract Documents (attach pages as necessary) supported by the documentation attached hereto: _____

_____

_____

	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 the Contractor.		
(H)	**Subtotal (F+G)**		
(I)	**Time**	**_____ Days**	
(J)	**Contractor's Home Office Overhead** This shall be no more than $200 times the number of days of Item (I) (i.e., not to exceed $200/day)		
(M)	**TOTAL (H+J)**		

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 which have no basis in fact or which the Contractor knows are false are at the sole risk of the 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.

For Contractor:

_____
Signature

_____
Date

_____
Title

_____
Name

17.8.2. All proposed cost requests by the 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 the 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, 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 or Caltrans rates, 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 actual time to be paid for equipment shall be the time that the equipment is in productive operation on the Work under Contract Modification. In computing the hourly rental of equipment, any time less than thirty (30) minutes shall be considered one-half (1/2) hour. No payment will be made for time while equipment is inoperative due to breakdown, or for non-workdays. In addition, 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 such 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 Contract Modification.

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 the 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. The Contractor shall immediately notify the District of such and the price set for any such rental shall be agreed upon in advance by the Contractor and the District.

17.8.2.3.6. **Overhead and Profit.** Markup for overhead and profit, which shall be used to compensate the Contractor for all costs for all administration, general conditions, and supervision, including, without limitation:

17.8.2.3.6.1. All field, field office and home 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.

17.8.2.3.6.2. All field, field office and home office expenses including, but not limited to, field trailers, parking, storage sheds, office equipment and supplies, telephone service and long distance telephone calls, 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.

17.8.2.3.6.3. 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.

17.8.2.3.6.4. 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.

17.8.2.3.6.5. All costs for the Contractor's bonds and insurance.

17.8.2.3.6.6. **Taxes:** Federal excise tax shall not be included. The District will issue an exemption on request.

17.8.2.3.7. Justification for any adjustment in Contract Time including a schedule analysis identifying critical schedule activities delayed by the request.

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 which have no basis in fact or which the Contractor knows are false are at the sole risk of the 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. The District acceptance of a PCO;

17.10.1.2. By unit prices contained in the Contractor's original bid;

17.10.1.3. By agreement between the District and the Contractor.

17.11. Deductive Change Orders

If the Contractor offers a proposed amount for a deductive Change Order(s), the 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 and Construction Change Directives, the 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 the Contractor is required to maintain pursuant to the Contract Documents.

17.14. Notice Required

If the Contractor is seeking an adjustment in the Contract Price, or any extension in the Contract Time for Completion, it shall notify the 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. The 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 or Construction Change Directives issued to Subcontractors by the Contractor to the extent as required by the Contract Documents.

17.16. Alteration to Change Order Language

The Contractor shall not alter Change Orders or reserve time in Change Orders. The Contractor shall execute finalized Change Orders and proceed under the provisions herein with proper notice.

17.17. Failure of Contractor to Execute Change Order

The Contractor shall be in default of the Contract if the 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. The 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. The 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 the 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, the Contractor shall diligently review the Contract Documents for information responsive to the RFI, including information incorporated by reference. The 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. The 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 the Contractor's subcontractor. Untimely submission of any RFI will preclude the Contractor from asserting any claims for delay or for labor impact against 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.

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, the 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 retentions 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:

19.2.1.1.1.14.1. ***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. The 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. <u>Prerequisites for Progress Payments</u>

19.2.2.1. **<u>First Payment Request</u>.** The following items, if applicable, must be completed before the 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. The 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 the 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 the 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 the Contractor's project manager, and if applicable, job site secretary, record documents recorder, and job site superintendent.

19.2.2.2. **Second Payment Request.** The 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 the Contractor where criteria set forth herein have not been met shall not constitute a waiver of said criteria by the District. Instead, such payment shall be construed as a good faith effort by the District to resolve differences so the Contractor may pay its Subcontractors and suppliers. The Contractor agrees that failure to submit such items may constitute a material breach of the Contract by the Contractor and may subject the 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, the 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. The District's approval of each Application for Payment shall be based on the Contractor complying with all requirements for a fully complete and valid Application for Payment.

19.3.2. <u>Payments to Contractor</u>

19.3.2.1. Within thirty (30) days after approval of the Application for Payment, the Contractor shall be paid a sum equal to ninety-five percent (95%) of the value of the Work performed (as verified by the Architect and Inspector and certified by the 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 the Contractor's best estimate. No inaccuracy or error in the 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. The District shall withhold five percent (5%) retention from all Progress Payments.

19.3.2.3. The 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.

19.3.3. No Waiver

No payment by the District hereunder shall be interpreted so as to imply that the 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, the Contractor and the Contractor's Surety shall promptly, on demand by the District and at the 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 the District from any sum payable to the Contractor pursuant to the Contract.

19.4. Decisions to Withhold Payment

19.4.1. Reasons to Withhold Payment

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

19.4.1.1. Defective Work not remedied within **FORTY-EIGHT (48)** hours of written notice to the 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 the 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 the Contractor or the 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. The 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. The District may, in its discretion, apply any withheld amount to pay outstanding claims or obligations as defined herein. In so doing, the District shall make such payments on behalf of the Contractor. If any payment is so made by the District, then that amount shall be considered a payment made pursuant to the Contract and the District shall not be liable to the Contractor for any payment made in good faith. These payments may be made without prior judicial determination of claim or obligation. The District will render the Contractor an accounting of funds disbursed on behalf of the Contractor.

19.4.2.2. If the Contractor defaults or neglects to perform the Work in accordance with the Contract Documents or fails to perform any provision thereof, the District may, after **FORTY-EIGHT (48)** hours' written notice to the Contractor and, without prejudice to any other remedy, make good such deficiencies. The District shall adjust the total Contract Price by reducing the amount thereof by the cost of making good such deficiencies. If the 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 the 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. The 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. The District shall have no obligation to pay, or to see to the payment of, money to a Subcontractor except as may otherwise be required by law.

19.5.3. Joint Checks. The 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. The 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 the 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. Although there is no "substantial completion" for this Project, 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 the District, except for minor corrective items, as distinguished from incomplete items. If the Contractor fails to complete all minor corrective items within thirty-five (35) days after the date of the District's acceptance of the Project, the 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 the 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, the District may elect to proceed as provided herein related to adjustments to Contract Price, and/or the District's right to perform the Work of the Contractor.

20.2. Closeout Procedures

20.2.1. Punch List

The Contractor shall notify the Architect when the Contractor considers the Work complete. Upon notification, the Architect will prepare a list of minor items to be completed or corrected ("Punch List"). The 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. The 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, the Contractor shall obtain the Inspector's approval of the final set of As-Built Drawings.

20.2.2.3. **Operations and Maintenance Manuals.** Contractor shall prepare all operation and maintenance manuals and date as indicated in the Specifications.

20.2.2.4. **Closeout Documentation.** The 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 and Maintenance Manuals and information, as further defined herein.

20.2.2.4.3. All Warranties, as further defined herein, including by way of illustration and not by limitation, a complete, accurate, and fully executed copy of DOCUMENT 00 65 36 (WARRANTY AND GUARANTEE FORM).

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. The Contractor shall comply with Punch List procedures as provided herein, and maintain the presence of a Project Superintendent and Project Manager until the Punch List is complete to ensure proper and timely completion of the Punch List. Under no circumstances shall the Contractor demobilize its forces prior to completion of the Punch List. Upon receipt of the 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, the Architect and Project Inspector will inspect the Work and shall submit to the Contractor and the 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 the 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 the Architect, who shall again inspect such Work. If the Architect finds the Work complete and acceptable under the Contract Documents, the Architect will notify the 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 the 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 the District, the Architect, the Construction Manager, and/or Project Inspector, and all subsequent costs will be invoiced to the 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 the 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 the 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 the 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; and

21.2.4. The 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 the 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. The Contractor must have completed all requirements set forth under "Closeout Procedures," including, without limitation, submission of an approved set of complete Record Drawings.

21.2.7. The Architect shall have issued its written approval that final payment can be made.

21.2.8. The Contractor shall have delivered to the District all manuals and materials required by the Contract Documents.

21.2.9. The 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 the 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.

22. UNCOVERING OF WORK

If a portion of the Work is covered without 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.

23. NONCONFORMING WORK AND CORRECTION OF WORK

23.1. Nonconforming Work

23.1.1. The Contractor shall promptly remove from the Premises all Work identified by the District as failing to conform to the Contract Documents whether incorporated or not. The 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.

23.1.2. If the Contractor does not remove Work that the District has identified as failing to conform to the Contract Documents within a reasonable time, not to exceed **FORTY-EIGHT (48)** hours, the District may remove it and may store any material at the Contractor's expense. If the Contractor does not pay expense(s) of that removal within ten (10) days' time thereafter, the 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 the District may withhold those amounts from payment(s) to the Contractor.

23.2. Correction of Work

23.2.1. **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.

23.2.2. **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.

23.3. District's Right to Perform Work

23.3.1. 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.

23.3.2. 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:

23.3.2.1. That all such improper Work be removed, remade or replaced, and all Work disturbed by these changes be made good by the Contractor at no additional cost to the District;

23.3.2.2. That the District deduct from any amount due the 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

23.3.2.3. 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 Construction Change Directive, or invoice the Contractor for the cost of that work. The Contractor shall pay any invoices within thirty (30) days of receipt of same or the District may withhold those amounts from payment(s) to the Contractor.

24. TERMINATION AND SUSPENSION

24.1. District's Right to Terminate Contractor for Cause

24.1.1. 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:

24.1.1.1. The 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

24.1.1.2. The Contractor fails to complete said Work within the time specified or any extension thereof, or

24.1.1.3. The Contractor persistently fails or refuses to perform Work or provide material of sufficient quality as to be in compliance with the Contract Documents; or

24.1.1.4. The Contractor files a petition for relief as a debtor, or a petition is filed against the Contractor without its consent, and the petition is not dismissed within sixty (60) days; or

24.1.1.5. The Contractor makes a general assignment for the benefit of its creditors, or a receiver is appointed on account of its insolvency; or

24.1.1.6. The 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

24.1.1.7. The Contractor fails to make prompt payment to Subcontractors, or for material, or for labor; or

24.1.1.8. The Contractor persistently disregards laws, or ordinances, or instructions of the District; or

24.1.1.9. The 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

24.1.1.10. The Contractor or its Subcontractor(s) is/are otherwise in breach, default, or in substantial violation of any provision of this Contract.

24.1.2. Notification of Termination

24.1.2.1. Upon the occurrence at the District's sole determination of any of the above conditions, the District may, without prejudice to any other right or remedy, serve written notice upon the Contractor and its Surety of the 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 the 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, the Contractor shall not be entitled to receive any further payment until the entire Work is finished.

24.1.2.2. Upon termination, the District may immediately serve written notice of tender upon Surety whereby Surety shall have the right to take over and perform this Contract only if Surety:

24.1.2.2.1. Within three (3) days after service upon it of the notice of tender, gives the District written notice of Surety's intention to take over and perform this Contract; and

24.1.2.2.2. Commences performance of the Contract within three (3) days from date of serving of its notice to the District.

24.1.2.3. If Surety fails to notify the District or begin performance as indicated herein, the District may take over the Work and execute the Work to completion by any method it may deem advisable at the expense of the Contractor and/or its Surety. The Contractor and/or its Surety shall be liable to the 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, the 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 the Contractor as may be on the Site of the Work, in bonded storage, or previously paid for.

24.1.3. Effect of Termination

24.1.3.1. The 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 the Contractor that have not been incorporated in the construction of the Work, or which are not in place in the Work. The District retains the right, but not the obligation, to keep and use any materials and personal property belonging to the Contractor that have not been incorporated in the construction of the Work, or which are not in place in the Work. The 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.

24.1.3.2. 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.

24.1.3.3. 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 the Contractor's bonding capacity.

24.1.3.4. If the expense to the District to finish the Work exceeds the unpaid Contract Price, the Contractor and Surety shall pay the difference to the District within twenty-one (21) days of the District's request.

24.1.3.5. The 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 its 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. The Contractor must include this assignment provision in all of its contracts with its Subcontractors.

24.1.3.6. The foregoing provisions are in addition to and not in limitation of any other rights or remedies available to the District.

24.2. Emergency Termination of Public Contracts Act of 1949

24.2.1. 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.

24.2.1.1. 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.

24.2.1.2. 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.

24.2.2. Compensation to the Contractor shall be determined at the sole discretion of the 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. The District, in its sole discretion, may adopt the Contract Price as the reasonable value of the Work performed or any portion thereof.

24.3. Termination of Contractor for Convenience

24.3.1. The 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, the Contractor shall have no claims against the District except:

24.3.1.1. The actual cost for labor, materials, and services performed that is unpaid and can be documented through timesheets, invoices, receipts, or otherwise, and

24.3.1.2. Five percent (5%) of the total cost of the 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 of the Contractor's and its Subcontractor(s)' mobilization and/or demobilization costs and any anticipated lost profits resulting from termination of the Contractor for convenience.

24.4. Suspension of Work

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

24.4.2. In the event that the District exercises this option, the District shall pay for any and all Work and materials completed or delivered onto the Site for which value is received, and the value of any and all Work then in progress and orders actually placed which cannot be canceled up to the date of notice of termination. The value of work and materials paid for shall include a factor of six percent (6%) for the Contractor's overhead and profit and there shall be no other costs or expenses paid to the Contractor. All work, materials and orders paid for pursuant to this provision shall become the property of the District.

24.5. 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.

25. CLAIMS

25.1. Performance during Claim Resolution Process

The Contractor shall diligently proceed with Work on the Project at the same time that Claims are addressed under this Article. It is the intent of the District to resolve Disputes with the Contractor as close to the events giving rise to the Disputes as possible, and to avoid stale or late Claims and the late documenting of Claims. The Contractor's failure to diligently proceed in accordance with the District's instructions or the Contract terms will be considered a material breach of this Agreement and a waiver of the Contractor's rights under this Agreement.

25.2. Waiver

If the Contractor fails to timely submit any written notices required under the terms of the Contract or in this Claims section, the Contractor waives and releases its rights regarding further review of its Claim, unless the Contractor and the District mutually agree in writing to other time limits.

25.3. 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.

25.4. Exclusive Remedy

Compliance with the notice provisions of the Contract as well as the claim submission procedures described in this Claims section is an express condition precedent to the Contractor's right to commence litigation, file a claim under the California Government Code, or commence any other legal action. The Contractor cannot assert or bring any Claim in any Government Code claim or subsequent legal action until that Claim has gone through the Claims Resolution Process herein. The District hereby exercises the power conferred upon it by Government Code Sections 930.2 and 930.4 to augment claims presentation procedures and create its own Claims Resolution Process as an exclusive remedy as indicated in this Claims section.

25.5. Other Provisions

If portions of the Contract, other than this Claims section, 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 section shall control the resolution of all Claims.

25.6. Subcontractors

The Contractor is responsible for providing this Claims section 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 the Claims resolution process in this Claims section. No Claim submitted by any party that fails to follow the provisions of this Claims section will be considered. The 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 section to its Subcontractors or others who may assert Claims by and through Subcontractors and/or the Contractor.

25.7. Claim Resolution Process

25.7.1. Claim, Defined. As used herein, "Claim" means a separate demand by the Contractor sent by registered mail or certified mail with return receipt requested, for one or more of the following:

25.7.1.1. A time extension, including, without limitation, for relief from damages or penalties for delay assessed by the District under this Agreement;

25.7.1.2. Payment by the District of money or damages arising from work done by, or on behalf of, the Contractor pursuant to the Agreement and payment for which is not otherwise expressly provided or to which the claimant is not otherwise entitled;

25.7.1.3. Payment of an amount that is disputed by the District.

25.7.2. Claim Initiation. Every Claim shall be stated with specificity in writing and signed by the Contractor under penalty of perjury and presented to the District within ten (10) calendar days from the date the Contractor discovers or reasonably should discover, that an act, error or omission of the District, its agents or employees, or action, condition or other situation has occurred that may entitle the Contractor to file a Claim. The Contractor shall provide

this writing even if the Contractor has not yet been damaged, delayed, or incurred extra cost when the 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:

25.7.2.1. Identify all of the issues, events, conditions, circumstances and/or causes giving rise to the Claim;

25.7.2.2. 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

25.7.2.3. Identify in detail line-item costs if the Claim seeks money.

25.7.2.4. 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 the 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).

25.7.2.5. If the Claim involves an error or omission in the Contract Documents:

25.7.2.5.1. An affirmative representation under penalty of perjury by the Contractor and any affected Subcontractors and suppliers that the error or omission was not discovered prior to submitting a proposal for the Work, and

25.7.2.5.2. A detailed statement demonstrating that the error or omission reasonably should not have been discovered, by the Contractor, its Subcontractors and suppliers, prior to submitting a proposal for the Work.

25.7.2.5.3. The Contractor shall not be entitled to compensation for escalation of materials costs unless the Contractor demonstrates to the satisfaction of the District that such cost escalation is the result of unusual, unforeseeable market conditions, not the fault of the Contractor, and was not reasonably foreseeable at the time of the award of the Contract. The Contractor shall provide evidence to the District of the costs included in the Contract for those materials and that those costs were reasonable at the time and that the Contractor timely ordered the materials at issue.

25.7.2.6. The writing shall be accompanied by all documents substantiating the Contractor's position regarding the Claim. 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 the Contract Time.

25.7.2.7. The Contractor acknowledges that its failure, for any reason, to give written notice (with supporting documentation to permit the District's review and evaluation) within the time frame required by the provisions in this Claims Article, or its 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 shall be deemed the 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 such instruction, request, Drawings, Specifications, action, condition, omission, default or other situation. The Contractor further acknowledges that strict compliance with the requirements of the provisions in this Claims Article is an express condition precedent to the Contractor's right to arbitrate or litigate a claim. The Contractor specifically agrees to assert no demands or claims in arbitration or litigation unless there has been strict compliance with the provisions in this Claims Article.

25.7.3. **Response to Claim by District.** Upon receipt of a Claim from the Contractor, the District shall conduct a reasonable review of the Claim and, within a period not to exceed 45 days, shall provide the Contractor a written statement identifying what portion of the Claim is disputed and what portion is undisputed. Upon receipt of a Claim, the District and the Contractor may, by mutual agreement, extend the time period provided in herein.

25.7.3.1. **Extension for Governing Board.** If the District needs approval from its governing board to provide the Contractor a written statement identifying the disputed portion and the undisputed portion of the Claim, and the governing board does not meet within the 45 days or within the mutually agreed-to extension of time following receipt of a Claim sent by registered mail or certified mail, return receipt requested, the District shall have up to three (3) days following the next duly publicly noticed meeting of the governing board after the 45-day period, or extension, expires to provide the Contractor a written statement identifying the disputed portion and the undisputed portion.

25.7.3.2. **Payment of Undisputed Portion.** Any payment due on an undisputed portion of the 9204 Claim shall be processed and made within 60 days after the District issues its written statement. If the District fails to issue a written statement, the section of this Article bearing the heading *Failure to Respond*, *infra*, shall apply.

25.7.4. **Meet and Confer Conference.** If the Contractor disputes the District's written response, or if the District fails to respond to a Claim issued pursuant to this section within the time prescribed, the Contractor may demand in writing an informal conference to meet and confer for settlement of the issues in dispute. Upon receipt of a demand in writing sent by registered mail or certified mail, return receipt requested, the District shall schedule a meet and confer conference within 30 days for settlement of the dispute.

25.7.5. **Written Statement of Dispute by District and Nonbinding Mediation.** Within 10 business days following the conclusion of the meet and confer conference, if the Claim or any portion of the Claim remains in dispute, the District shall provide the Contractor a written statement identifying the portion of the Claim that remains in dispute and the portion that is undisputed. Any payment due on an undisputed portion of the Claim shall be processed and made within 60 days after the District issues its written statement. Any disputed portion of the Claim, as identified by the Contractor in writing, shall be submitted to nonbinding mediation, with the District and the Contractor sharing the associated costs equally. The District and the Contractor shall mutually agree to a mediator within 10

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

25.7.6. **Failure to Respond.** Failure by the District to respond to a Claim from the Contractor within the time periods described in this Section 25.7 or to otherwise meet the time requirements of this Section 25.7 shall result in the Claim being deemed rejected in its entirety. A Claim that is denied by reason of the District's failure to have responded to a Claim, or its failure to otherwise meet the time requirements of this Section 25.7, shall not constitute an adverse finding with regard to the merits of the Claim or the responsibility or qualifications of the Contractor.

25.7.7. **Post Mediation Provisions for Prosecution of Claims of $375,000 or Less.** Where a Claim is subject to Public Contract Code, §§ 20104 et seq., the provisions of Public Contract Code § 20104.4 shall apply, and 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 section 25.7.7 and Public Contract Code, §§ 20104 et seq. 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.

25.7.8. **Post Mediation Provisions for Prosecution of Claims in Excess of $375,000.** Where a Claim is not subject to Public Contract Code, §§ 20104 et seq., 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. Where a Claim is not subject to Public Contract Code, §§ 20104 et seq., by mutual agreement, the Parties can agree to instead resolve the Claim through arbitration.

25.7.9. **False Claims.** 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.

25.8. **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.

25.9. **Claim Resolution Process – Non-Applicability**

The procedures and provisions in this Claims section shall not apply to:

25.9.1. The 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;

25.9.2. The District's rights and obligations as a public entity, such as, but without limitation, the revocation of pre-qualified 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 Section 7107 of the Public Contract Code, shall be subject to the mandatory dispute resolution provisions of this Claims section and the Contract;

25.9.3. Personal injury, wrongful death or property damage claims;

25.9.4. Latent defect or breach of warranty or guarantee to repair;

25.9.5. Stop notices or stop payment notices; or

25.9.6. Any other District rights as set forth herein.

25.10. <u>Reprinting of Public Contract Code, § 9204</u>

Pub. Contract Code, § 9204 is reprinted below:

[Start Pub. Contract Code, § 9204] [Effective January 1, 2020]

(a) The Legislature finds and declares that it is in the best interests of the state and its citizens to ensure that all construction business performed on a public works project in the state that is complete and not in dispute is paid in full and in a timely manner.

(b) Notwithstanding any other law, including, but not limited to, Article 7.1 (commencing with Section 10240) of Chapter 1 of Part 2, Chapter 10 (commencing with Section 19100) of Part 2, and Article 1.5 (commencing with Section 20104) of Chapter 1 of Part 3, this section shall apply to any claim by a contractor in connection with a public works project.

(c) For purposes of this section:

(1) "Claim" means a separate demand by a contractor sent by registered mail or certified mail with return receipt requested, for one or more of the following:

(A) A time extension, including, without limitation, for relief from damages or penalties for delay assessed by a public entity under a contract for a public works project.

(B) Payment by the public entity of money or damages arising from work done by, or on behalf of, the contractor pursuant to the contract for a public works project and payment for which is not otherwise expressly provided or to which the claimant is not otherwise entitled.

(C) Payment of an amount that is disputed by the public entity.

(2) "Contractor" means any type of contractor within the meaning of Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code who has entered into a direct contract with a public entity for a public works project.

(3)

(A) "Public entity" means, without limitation, except as provided in subparagraph (B), a state agency, department, office, division, bureau, board, or commission, the California State University, the University of California, a city, including a

charter city, county, including a charter county, city and county, including a charter city and county, district, special district, public authority, political subdivision, public corporation, or nonprofit transit corporation wholly owned by a public agency and formed to carry out the purposes of the public agency.

(B) "Public entity" shall not include the following:

(i) The Department of Water Resources as to any project under the jurisdiction of that department.

(ii) The Department of Transportation as to any project under the jurisdiction of that department.

(iii) The Department of Parks and Recreation as to any project under the jurisdiction of that department.

(iv) The Department of Corrections and Rehabilitation with respect to any project under its jurisdiction pursuant to Chapter 11 (commencing with Section 7000) of Title 7 of Part 3 of the Penal Code.

(v) The Military Department as to any project under the jurisdiction of that department.

(vi) The Department of General Services as to all other projects.

(vii) The High-Speed Rail Authority.

(4) "Public works project" means the erection, construction, alteration, repair, or improvement of any public structure, building, road, or other public improvement of any kind.

(5) "Subcontractor" means any type of contractor within the meaning of Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code who either is in direct contract with a contractor or is a lower tier subcontractor.

(d)

(1)

(A) Upon receipt of a claim pursuant to this section, the public entity to which the claim applies shall conduct a reasonable review of the claim and, within a period not to exceed 45 days, shall provide the claimant a written statement identifying what portion of the claim is disputed and what portion is undisputed. Upon receipt of a claim, a public entity and a contractor may, by mutual agreement, extend the time period provided in this subdivision.
(B) The claimant shall furnish reasonable documentation to support the claim.
(C) If the public entity needs approval from its governing body to provide the claimant a written statement identifying the disputed portion and the undisputed portion of the claim, and the governing body does not meet within the 45 days or within the mutually agreed to extension of time following receipt of a claim sent by registered mail or certified mail, return receipt requested, the public entity shall have up to three days following the next duly publicly noticed meeting of the governing body after the 45-day period, or extension, expires to provide the claimant a written statement identifying the disputed portion and the undisputed portion.
(D) Any payment due on an undisputed portion of the claim shall be processed

and made within 60 days after the public entity issues its written statement. If the public entity fails to issue a written statement, paragraph (3) shall apply.

(2)

(A) If the claimant disputes the public entity's written response, or if the public entity fails to respond to a claim issued pursuant to this section within the time prescribed, the claimant may demand in writing an informal conference to meet and confer for settlement of the issues in dispute. Upon receipt of a demand in writing sent by registered mail or certified mail, return receipt requested, the public entity shall schedule a meet and confer conference within 30 days for settlement of the dispute.

(B) Within 10 business days following the conclusion of the meet and confer conference, if the claim or any portion of the claim remains in dispute, the public entity shall provide the claimant a written statement identifying the portion of the claim that remains in dispute and the portion that is undisputed. Any payment due on an undisputed portion of the claim shall be processed and made within 60 days after the public entity issues its written statement. Any disputed portion of the claim, as identified by the contractor in writing, shall be submitted to nonbinding mediation, with the public entity and the claimant sharing the associated costs equally. The public entity and claimant shall mutually agree to a mediator within 10 business days after the disputed portion of the claim has been identified in writing. If the parties cannot agree upon a mediator, each party shall select a mediator and those mediators shall select a qualified neutral third party to mediate with regard to the disputed portion of the claim. Each party shall bear the fees and costs charged by its respective mediator in connection with the selection of the neutral mediator. If mediation is unsuccessful, the parts of the claim remaining in dispute shall be subject to applicable procedures outside this section.

(C) For purposes of this section, mediation includes any nonbinding process, including, but not limited to, neutral evaluation or a dispute review board, in which an independent third party or board assists the parties in dispute resolution through negotiation or by issuance of an evaluation. Any mediation utilized shall conform to the timeframes in this section.

(D) Unless otherwise agreed to by the public entity and the contractor in writing, the mediation conducted pursuant to this section shall excuse any further obligation under Section 20104.4 to mediate after litigation has been commenced.

(E) This section does not preclude a public entity from requiring arbitration of disputes under private arbitration or the Public Works Contract Arbitration Program, if mediation under this section does not resolve the parties' dispute.

(3) Failure by the public entity to respond to a claim from a contractor within the time periods described in this subdivision or to otherwise meet the time requirements of this section shall result in the claim being deemed rejected in its entirety. A claim that is denied by reason of the public entity's failure to have responded to a claim, or its failure to otherwise meet the time requirements of this section, shall not constitute an adverse finding with regard to the merits of the claim or the responsibility or qualifications of the claimant.

(4) Amounts not paid in a timely manner as required by this section shall bear interest at 7 percent per annum.

(5) If a subcontractor or a lower tier subcontractor lacks legal standing to assert a claim against a public entity because privity of contract does not exist, the contractor may present

to the public entity a claim on behalf of a subcontractor or lower tier subcontractor. A subcontractor may request in writing, either on their 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 public entity 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 public entity and, if the original contractor did not present the claim, provide the subcontractor with a statement of the reasons for not having done so.

(e) The text of this section or a summary of it shall be set forth in the plans or specifications for any public works project that may give rise to a claim under this section.

(f) A waiver of the rights granted by this section is void and contrary to public policy, provided, however, that (1) upon receipt of a claim, the parties may mutually agree to waive, in writing, mediation and proceed directly to the commencement of a civil action or binding arbitration, as applicable; and (2) a public entity may prescribe reasonable change order, claim, and dispute resolution procedures and requirements in addition to the provisions of this section, so long as the contractual provisions do not conflict with or otherwise impair the timeframes and procedures set forth in this section.

(g) This section applies to contracts entered into on or after January 1, 2017.

(h) Nothing in this section shall impose liability upon a public entity that makes loans or grants available through a competitive application process, for the failure of an awardee to meet its contractual obligations.

(i) This section shall remain in effect only until January 1, 2027, and as of that date is repealed, unless a later enacted statute, that is enacted before January 1, 2027, deletes or extends that date.

[End Pub. Contract Code, § 9204]

25.11. <u>Reprinting of Public Contract Code, § 20104 et seq</u>.

Pub. Contract Code, § 20104 is reprinted below:

[Start Pub. Contract Code, § 20104] [As of January 1, 2018]

20104

(a)

(1) This article applies to all public works claims of three hundred seventy-five thousand dollars ($375,000) or less which arise between a contractor and a local agency.

(2) This article shall not apply to any claims resulting from a contract between a contractor and a public agency when the public agency has elected to resolve any disputes pursuant to Article 7.1 (commencing with Section 10240) of Chapter 1 of Part 2.

(b)

(1) “Public work” means “public works contract” as defined in Section 1101 but does not include any work or improvement contracted for by the state or the Regents of the University of California.

(2) "Claim" means a separate demand by the contractor for (A) a time extension, (B) payment of money or damages arising from work done by, or on behalf of, the contractor pursuant to the contract for a public work and payment of which is not otherwise expressly provided for or the claimant is not otherwise entitled to, or (C) an amount the payment of which is disputed by the local agency.

(c) The provisions of this article or a summary thereof shall be set forth in the plans or specifications for any work which may give rise to a claim under this article.

(d) This article applies only to contracts entered into on or after January 1, 1991.

(Amended by Stats. 2010, Ch. 697, Sec. 47. (SB 189) Effective January 1, 2011. Operative July 1, 2012, by Sec. 105 of Ch. 697.)

20104.2. For any claim subject to this article, the following requirements apply:

(a) The claim shall be in writing and include the documents necessary to substantiate the claim. Claims must be filed on or before the date of final payment. Nothing in this subdivision is intended to extend the time limit or supersede notice requirements otherwise provided by contract for the filing of claims.

(b)

(1) For claims of less than fifty thousand dollars ($50,000), the local agency shall respond in writing to any written claim within 45 days of receipt of the claim, or may request, in writing, within 30 days of receipt of the claim, any additional documentation supporting the claim or relating to defenses to the claim the local agency may have against the claimant.

(2) If additional information is thereafter required, it shall be requested and provided pursuant to this subdivision, upon mutual agreement of the local agency and the claimant.

(3) The local agency's written response to the claim, as further documented, shall be submitted to the claimant within 15 days after receipt of the further documentation or within a period of time no greater than that taken by the claimant in producing the additional information, whichever is greater.

(c)

(1) For claims of over fifty thousand dollars ($50,000) and less than or equal to three hundred seventy-five thousand dollars ($375,000), the local agency shall respond in writing to all written claims within 60 days of receipt of the claim, or may request, in writing, within 30 days of receipt of the claim, any additional documentation supporting the claim or relating to defenses to the claim the local agency may have against the claimant.

(2) If additional information is thereafter required, it shall be requested and provided pursuant to this subdivision, upon mutual agreement of the local agency and the claimant.

(3) The local agency's written response to the claim, as further documented, shall be submitted to the claimant within 30 days after receipt of the further documentation, or within a period of time no greater than that taken by the claimant in producing the additional information or requested documentation, whichever is greater.

(d) If the claimant disputes the local agency's written response, or the local agency fails to respond within the time prescribed, the claimant may so notify the local agency, in writing, either within 15

days of receipt of the local agency's response or within 15 days of the local agency's failure to respond within the time prescribed, respectively, and demand an informal conference to meet and confer for settlement of the issues in dispute. Upon a demand, the local agency shall schedule a meet and confer conference within 30 days for settlement of the dispute.

(e) Following the meet and confer conference, if the claim or any portion remains in dispute, the claimant may file a claim as provided in Chapter 1 (commencing with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of the Government Code. For purposes of those provisions, the running of the period of time within which a claim must be filed shall be tolled from the time the claimant submits his or her written claim pursuant to subdivision (a) until the time that claim is denied as a result of the meet and confer process, including any period of time utilized by the meet and confer process.

(f) This article does not apply to tort claims and nothing in this article is intended nor shall be construed to change the time periods for filing tort claims or actions specified by Chapter 1 (commencing with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of the Government Code.

(Added by Stats. 1994, Ch. 726, Sec. 22. Effective September 22, 1994.)

20104.4. The following procedures are established for all civil actions filed to resolve claims subject to this article:

(a) Within 60 days, but no earlier than 30 days, following the filing or responsive pleadings, the court shall submit the matter to nonbinding mediation unless waived by mutual stipulation of both parties. The mediation process shall provide for the selection within 15 days by both parties of a disinterested third person as mediator, shall be commenced within 30 days of the submittal, and shall be concluded within 15 days from the commencement of the mediation unless a time requirement is extended upon a good cause showing to the court or by stipulation of both parties. If the parties fail to select a mediator within the 15-day period, any party may petition the court to appoint the mediator.

(b)

(1) If the matter remains in dispute, the case shall be submitted to judicial arbitration pursuant to Chapter 2.5 (commencing with Section 1141.10) of Title 3 of Part 3 of the Code of Civil Procedure, notwithstanding Section 1141.11 of that code. The Civil Discovery Act (Title 4 (commencing with Section 2016.010) of Part 4 of the Code of Civil Procedure) shall apply to any proceeding brought under this subdivision consistent with the rules pertaining to judicial arbitration.

(2) Notwithstanding any other provision of law, upon stipulation of the parties, arbitrators appointed for purposes of this article shall be experienced in construction law, and, upon stipulation of the parties, mediators and arbitrators shall be paid necessary and reasonable hourly rates of pay not to exceed their customary rate, and such fees and expenses shall be paid equally by the parties, except in the case of arbitration where the arbitrator, for good cause, determines a different division. In no event shall these fees or expenses be paid by state or county funds.

(3) In addition to Chapter 2.5 (commencing with Section 1141.10) of Title 3 of Part 3 of the Code of Civil Procedure, any party who after receiving an arbitration award requests a trial de novo but does not obtain a more favorable judgment shall, in addition to payment of costs and fees under that chapter, pay the attorney's fees of the other party arising out of the trial de novo.

(c) The court may, upon request by any party, order any witnesses to participate in the mediation or arbitration process.

(Amended by Stats. 2004, Ch. 182, Sec. 54. Effective January 1, 2005. Operative July 1, 2005, by Sec. 64 of Ch. 182.)

20104.6.

(a) No local agency shall fail to pay money as to any portion of a claim which is undisputed except as otherwise provided in the contract.

(b) In any suit filed under Section 20104.4, the local agency shall pay interest at the legal rate on any arbitration award or judgment. The interest shall begin to accrue on the date the suit is filed in a court of law.

26. LABOR, WAGE AND HOUR, APPRENTICE AND RELATED PROVISIONS

26.1. Contractor and Subcontractor Registration

26.1.1. The 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."

26.1.2. The 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. The 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. The Contractor represents that all of its Subcontractors are registered pursuant to Labor Code section 1725.5.

26.1.3. The Project is subject to compliance monitoring and enforcement by the Department of Industrial Relations. The Contractor shall post job site notices, as prescribed by regulation. The 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.

26.2. Wage Rates, Travel and Subsistence

26.2.1. 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. The Contractor shall obtain and post a copy of these wage rates at the job site.

26.2.2. 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.

26.2.3. The 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 the Contractor or any Subcontractor and such workers.

26.2.4. 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 Notice to Bidders or the Contract subsequently awarded.

26.2.5. Pursuant to Labor Code section 1775, the Contractor shall, as a penalty to the 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 the Contract by the Contractor or by any Subcontractor under it.

26.2.5.1. The amount of the penalty shall not be less than forty dollars ($40) for each calendar day, or portion thereof, unless the failure of the Contractor was a good faith mistake and, if so, the error was promptly and voluntarily corrected when brought to the attention of the Contractor.

26.2.5.2. The amount of the penalty shall not be less than eighty dollars ($80) for each calendar day or portion thereof, if the Contractor has been assessed penalties within the previous three (3) years for failing to meet the Contractor's prevailing wage obligations on a separate contract, unless those penalties were subsequently withdrawn or overturned.

26.2.5.3. 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.

26.2.5.4. 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 the Contractor.

26.2.6. 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.

26.2.7. 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.

26.2.8. The 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, the 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).

26.3. Hours of Work

26.3.1. 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 day's work. The time of service of any worker employed at any time by the Contractor or by any Subcontractor on any subcontract under this Contract upon the Work or upon any part of the Work contemplated by this Contract shall be limited and restricted by the 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 the 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.

26.3.2. The 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 the 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 the District and to the Division of Labor Standards Enforcement of the DIR.

26.3.3. Pursuant to Labor Code section 1813, the 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 the Contractor or by any Subcontractor for each calendar day during which such worker is required or permitted to work more than eight (8) hours in any 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.

26.3.4. 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.

26.4. Payroll Records

26.4.1. If requested by the District, the Contractor shall provide to the District and shall cause each Subcontractor performing any portion of the Work to provide to the District an accurate and certified payroll record ("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.

26.4.1.1. 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. The District shall not make any payment to the Contractor until:

26.4.1.1.1. The Contractor and/or its Subcontractor(s) provide CPRs acceptable to the District, and

26.4.1.1.2. The District is given sufficient time to review and/or audit the CPRs to determine their acceptability. Any delay in the 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 the Contractor's payment.

26.4.2. All CPRs shall be available for inspection at all reasonable hours at the principal office of the Contractor on the following basis:

26.4.2.1. A certified copy of an employee's CPR shall be made available for inspection or furnished to the employee or his/her authorized representative on request.

26.4.2.2. CPRs shall be made available for inspection or furnished upon request to a representative of the District, Division of Labor Standards Enforcement, Division of Apprenticeship Standards, and/or the Department of Industrial Relations.

26.4.2.3. 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 the Contractor, Subcontractors, and the entity through which the request was made. The public shall not be given access to the records at the principal office of the Contractor.

26.4.3. 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)

26.4.4. 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.

26.4.5. Except as provided in subdivision (f) of section 1776 of the Labor Code, any copy of records made available for inspection as copies and furnished upon request to the public or any public agency by the District or the Division of Labor Standards Enforcement shall be marked or obliterated to prevent disclosure of an individual's name, address, and social security number. The name and address of the Contractor or any subcontractor performing the Contract shall not be marked or obliterated. Any copy of records made available for inspection by, or furnished to, a multiemployer Taft-Hartley trust fund (29 U.S.C. Sec. 186(c)(5)) that requests the records for the purposes of allocating contributions to participants shall be marked or obliterated only to prevent disclosure of an individual's full social security number, but shall provide the last four digits of the social security number. Any copy of records made available for inspection by, or furnished to, a joint labor-management committee established pursuant to the federal Labor Management Cooperation Act of 1978 (29 U.S.C. Sec. 175a) shall be marked or obliterated only to prevent disclosure of an individual's social security number.

26.4.6. The Contractor shall inform the District of the location of the records enumerated hereunder, including the street address, city, and county, and shall, within five (5) working days, provide a notice of change of location and address.

26.4.7. The Contractor or a subcontractor has 10 days in which to comply subsequent to receipt of a written notice requesting the records enumerated in subdivision (a). In the event that the Contractor or subcontractor fails to comply within the 10-day period, he or she shall, as a penalty to the District, forfeit one hundred dollars ($100) for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Labor Standards Enforcement, these penalties shall be withheld from progress payments then due. The Contractor is not subject to a penalty assessment pursuant to this section due to the failure of a subcontractor to comply with this section.

26.5. <u>Apprentices</u>

26.5.1. The 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 the Contractor to ensure compliance with this Article and with Labor Code section 1777.5 for all apprenticeship occupations.

26.5.2. 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.

26.5.3. Every such apprentice shall be paid the standard wage paid to apprentices under the regulations of the craft or trade at which he/she is employed, and shall be employed only at the work of the craft or trade to which she/he is registered.

26.5.4. 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 he/she is training.

26.5.5. Pursuant to Labor Code section 1777.5, if that section applies to this Contract as indicated above, the 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.

26.5.6. Pursuant to Labor Code section 1777.5, if that section applies to this Contract as indicated above, the Contractor and any Subcontractor may be required to make contributions to the apprenticeship program.

26.5.7. If the 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:

26.5.7.1. Be denied the right to bid on any subsequent project for one (1) year from the date of such determination;

26.5.7.2. Forfeit as a penalty to the 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.

26.5.8. The Contractor and all Subcontractors shall comply with Labor Code section 1777.6, which section forbids certain discriminatory practices in the employment of apprentices.

26.5.9. The 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.

26.5.10. The 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.

26.6. Non-Discrimination

26.6.1. The Contractor herein agrees not to discriminate in its recruiting, hiring, promotion, demotion, or termination practices on the basis of race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, genetic information, marital status, sex, gender, gender identity, gender expression, age, sexual orientation, or military and veteran status of any person 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 the Contractor and Subcontractor.

26.6.2. **Special requirements for Federally Assisted Construction Contracts.** During the performance of this Contract, the 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.

26.7. Labor First Aid

The Contractor shall maintain emergency first aid treatment for the 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.

27. MISCELLANEOUS

27.1. Assignment of Antitrust Actions

27.1.1. 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.

27.1.2. 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.

27.1.3. 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.

27.1.4. 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.

27.1.5. Under this Article, "public purchasing body" is the District and "bidder" is the Contractor.

27.2. 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, the District, upon request, will execute documents necessary to show (1) that the District is a political subdivision of the State for the purposes of such exemption, and (2) that the sale is for the exclusive use of the District. No Federal Excise Tax for such materials shall be included in any Contract Price.

27.3. Taxes

The 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.

27.4. 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.

27.5. 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, the 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. District Delay(s)

The "District Delay(s)" provision of the General Conditions (Document 00 70 00) is replaced with the following:

> If the Contractor is delayed by the District or anyone employed by it and granted an extension of time, or if the Contractor is delayed and the District is held responsible for such delay, the Contractor and the District agree that it is impractical and infeasible to determine the amount of actual damage suffered by the Contractor as a result of such delay. Such damages include, but are not limited to, extended home and field office overhead, impairment of bonding capacity, lost opportunity, and all other damages or claims, regardless of tier, attributable, or claimed to be attributable to any such delay. **Accordingly, in such an instance, it is agreed that the District will pay to the Contractor as fixed and liquidated damages, and not as a penalty, the following sum for each calendar day of delay beyond the Contract Time: FIVE HUNDRED ($500.00) dollars.**

2. The first subsection of the "No Changes Without Authorization" provision of the General Conditions (Document 00 70 00) is replaced with the following:

17.1.1. There shall be no change whatsoever in the Drawings, Specifications, or in the Work without an executed Change Order, a written Construction Change Directive, or a written Force Account Directive authorized by the District as herein provided. The 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 Construction Change Directive, or a written Force Account Directive.

17.1.1.1. The Contractor acknowledges and agrees that the following list constitutes an exhaustive list of the District's personnel that hold either actual or apparent authority to execute Change Order(s), written Construction Change Directive(s), or written Force Account Directive(s):

17.1.1.1.1. the Superintendent of the Yuba City Unified School District, presently **Doreen Osumi** and

17.1.1.1.2. **Scott Bentley**.

(collectively, the "Authorized Personnel").

17.1.1.2. In no event shall the Contractor attempt to obtain Change Order(s), written Construction Change Directive(s), or written Force Account Directive(s) from a person not included in the Authorized Personnel. The Contractor acknowledges and agrees that any purported Change Order(s), written Construction Change Directive(s), or written Force Account Directive(s) issued by a person not included in the Authorized Personnel shall be null and void.

3. Mitigation Measures

The 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.)

4. Modernization Projects

4.1. **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 the District and onsite District personnel before the 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 the Contractor's Work, the overtime wages for the custodian will be paid by the Contractor, unless, at the discretion of the District, other arrangements are made in advance.

4.2. **Master Key.** Upon request, the District may, at its own discretion, provide a master key to the school site for the convenience of the Contractor. The 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.

4.3. **Maintaining Services.** The 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 the District. The Contractor shall provide temporary services to all facilities interrupted by the Contractor's Work.

4.4. **Maintaining Utilities.** The Contractor shall maintain in operation during term of the Contract, drainage lines, storm drains, sewers, water, gas, electrical, steam, and other utility service lines within working area.

4.5. **Confidentiality.** The Contractor shall maintain the confidentiality of all information, documents, programs, procedures and all other items that the 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.

4.6. **Work During Instructional Time.** By submitting its bid, the Contractor affirms that Work may be performed during ongoing instruction in existing facilities. If so, the 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 the District.

4.7. **No Work During Student Testing.** The Contractor shall, at no additional cost to the District and at the 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.

5. Badge Policy For Contractors

The Contractor shall provide their workers and all of Subcontractors' workers with identification badges. These badges shall be worn by all members of the Contractor's staff and all of Subcontractors' staff who are working in a District facility.

5.1. Badges must be filled out in full and contain the following information:

5.1.1. Name of the Contractor;

5.1.2. Name of the Employee;

5.1.3. The Contractor's address and phone number.

5.2. Badges must be worn when the Contractor or his/her employees are on site and must be visible at all times. Contractors must inform their employees 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.

5.3. Failure to display identification badges as required by this policy may result in the assessment of fines against the Contractor.

6. Substitution for Specified Items

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

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

6.3. 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." The 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.

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

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

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

6.4.1. 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;

6.4.2. Available maintenance, repair or replacement services;

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

6.4.4. 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

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

6.5. 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 the Contractor. The Contractor warrants that if substitutes are approved:

6.5.1. 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;

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

6.5.3. 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 the Contract Price or the 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 the Contract Time;

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

6.5.5. 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.

6.6. In the event the 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 the Contractor.

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

6.8. 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.

7. Fingerprinting

The Contractor shall comply with the provisions of Education Code section 45125.2 regarding the submission of employee fingerprints to the California Department of Justice and the completion of criminal background investigations of its employees, its subcontractor(s), and its subcontractors' employees. The Contractor shall not permit any employee to have any contact with District pupils until such time as the Contractor has verified in writing to the governing board of the District, that such employee has not been convicted of a felony, as defined in Education Code section 45122.1. The Contractor shall fully complete and perform all tasks required pursuant to the Certification: Criminal Background Investigation/Fingerprinting.

8. 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:

January	**[11]**	July	**[0]**
February	**[10]**	August	**[0]**
March	**[10]**	September	**[1]**
April	**[6]**	October	**[4]**
May	**[3]**	November	**[7]**
June	**[1]**	December	**[10]**

9. **Insurance Policy Limits.** In lieu of the insurance policy limits specified in **Section 13.1.7** of the General Conditions, the limits of insurance shall not be less than the following amounts:

Commercial General Liability	Combined Single Limit	$2,000,000 per occurrence; $4,000,000 aggregate
	Product Liability and Completed Operations	$2,000,000 per occurrence; $4,000,000 aggregate
Automobile Liability – Any Auto	Combined Single Limit	$2,000,000 per occurrence; $4,000,000 aggregate
Workers Compensation		Statutory limits pursuant to State law
Employers' Liability		$5,000,000
Builder's Risk (Course of Construction)		Issued for the value and scope of Work indicated herein.

10. **Permits, Certificates, Licenses, Fees, Approval**

10.1. **Approvals, Certificates, Fees, Inspections, Licenses, Permits, Etc.**

10.1.1. **Permits in Bid Price.** The Contractor shall include in its Bid the cost of any approvals, certificates, fees, inspections, licenses, permits or similar requirements necessary for the performance of the Work ("Permits").

10.1.1.1. "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; local inspector fees; etc.

10.1.1.2. "Permits" does not include Project Inspector fees (which will be paid by the District unless otherwise indicated herein), professional licensing, or contractors' licensing.

10.1.1.3. 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.

10.2. **Certain Fees Not Part of Permits.** Notwithstanding the above requirements, the District shall oversee the obtaining and payment of the following permits, fees or charges, but the Contractor shall assist in those efforts as requested by the District at no additional cost to the District.

10.3. **Project Inspection**

10.3.1. In addition to the requirements in the Contract Documents related to cooperation with and authority of the DSA Project Inspector(s) for the Project, the Contractor acknowledges that the DSA inspection, approval and certification process for projects was revised in 2012-2013 and that the Contractor must comply with the requirements of the most recent versions of DSA document PR 13-01. Below are provisions of this document from 2012-2013: PR 13-01 (Procedure: Construction Oversight Process) - Duties of Contractor related to the use of "Project Inspection Card" (Form DSA 152).

10.3.1.1. The Contractor shall carefully study the DSA-approved documents and shall plan a schedule of operations well ahead of time.

10.3.1.2. 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.

10.3.1.3. Verify that forms DSA 152 are issued for the project prior to the commencement of construction.

10.3.1.4. Meet with the design team, the Laboratory of Record and the Project Inspector to mutually communicate and understand the testing and inspection program and the methods of communication appropriate for the project.

10.3.1.5. Notify the Project Inspector, in writing, of the commencement of construction of each and every aspect of the work at least 48 hours in advance by submitting form DSA 156 (or other agreed upon written documents) to the Project Inspector.

10.3.1.6. Notify the Project 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.

10.3.1.7. 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 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 the DSA or the District and are subject to removal and remediation if found to be in non-compliance with the DSA-approved construction documents.

END OF DOCUMENT

DOCUMENT 01 11 00

SUMMARY OF WORK

1. GENERAL

1.1. RELATED DOCUMENTS AND PROVISIONS

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions;

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any);

1.1.4. Submittals; and

1.1.5. Temporary Facilities and Controls.

1.2. SUMMARY OF WORK COVERED BY CONTRACT DOCUMENTS

The Work may consist of the following:

1.2.1. Selective demolition and construction necessary for the **YCHS GYM MECHANICAL,** including associated civil, architectural, structural, plumbing, mechanical and/or electrical work as indicated in the Drawings and Specifications. Generally, these categories of work involve new finishes, adaptive re-use and modification of certain selected areas, new cabinetry, handicap accessibility retrofits, re-roofing, and adding HVAC to instructional areas, library and administrative areas and pertain to changing and expanding selected infrastructure utilities, and extensive modifications.

1.2.2. The Project will involve the "phasing" and barricading of work areas as indicated on the Plans and enumerated in the Specifications.

1.3. CONTRACTS

Contractor shall perform the Work under a single, fixed-price Contract.

1.4. DEFERRED APPROVAL ITEMS

1.4.1. All items that are subject to subsequent review and approval by the Division of the State Architect are as indicated below. No deferred approval items shall be installed until the Contractor has complied with all the processes in the Contract Documents, including Division 01 Document “Submittals.”

1.5. SPECIAL PROJECT REQUIREMENTS

1.5.1. Hours of Work: Work is to be performed during regular work hours. Contractor shall coordinate its operations with activities taking place at each campus such as summer school. Contractor shall ensure that there are no disruptions to such activities.

1.6. CODES, REGULATIONS AND STANDARDS

1.6.1. The codes, regulations, and standards adopted by the State and federal agencies having jurisdiction shall govern minimum requirements for the Project. Where codes, regulations, and standards conflict with the Contract Documents, these conflicts shall be brought to the immediate attention of the District and the Architect.

1.6.2. Codes, regulations, and standards are as published effective as of date of bid opening, unless otherwise specified or indicated.

1.7. EXAMINATION OF EXISTING CONDITIONS

1.7.1. Contractor shall be held to have examined the Project Site and acquainted itself with the conditions of the Site and of the streets and roads approaching the Site.

1.7.2. Prior to commencement of Work, Contractor shall survey the Site and existing buildings and improvements to observe existing damage and defects such as cracks, sags, broken, missing or damaged glazing, other building elements and Site improvements, and other damage.

1.7.3. Should Contractor observe cracks, sags, and other damage to and defects of the Site and adjacent buildings, paving, and other items not indicated in the Contract Documents, Contractor shall immediately report same to the District and the Architect.

1.8. CONTRACTOR'S USE OF PREMISES

1.8.1. Contractor shall take all reasonable precautions for the safety of the students and the school employees throughout the duration of the Project.

1.8.2. If unoccupied and only with District’s prior written approval, Contractor may use the building(s) at the Project Site without limitation for its operations, storage, and office facilities for the performance of the Work. If the District chooses to beneficially occupy any building(s), Contractor must obtain the District's written approval for Contractor's use of spaces and types of operations to be performed within the building(s) while so occupied. Contractor's access to the building(s) shall be limited to the areas indicated.

1.8.3. If the space at the Project Site is not sufficient for Contractor's operations, storage, office facilities and/or parking, Contractor shall arrange and pay for any additional facilities needed by Contractor, at no expense to District.

1.8.4. Contractor shall not interfere with others use of or access to occupied portions of the building(s) or adjacent property.

1.8.5. Contractor shall maintain corridors, stairs, halls, and other exit-ways of building clear and free of debris and obstructions at all times.

1.8.6. No one other than those directly involved in the demolition and construction or specifically designated by the District or the Architect shall be permitted in the areas of Work during demolition and construction activities.

1.9. PROTECTION OF EXISTING STRUCTURES AND UTILITIES

1.9.1. The Drawings show above-grade and below-grade structures, utility lines, and other installations that are known or believed to exist in the area of the Work. Contractor shall locate these existing installations before proceeding with excavation and other operations

that could damage same; maintain them in service, where appropriate; and repair damage to them caused by the performance of the Work. Should damage occur to these existing installations, the costs of repair shall be at the Contractor's expense and made to the District's satisfaction.

1.9.2. Contractor shall be alert to the possibility of the existence of additional structures and utilities. If Contractor encounters additional structures and utilities, Contractor will immediately report to the District for disposition of same as indicated in the General Conditions.

1.10. UTILITY SHUTDOWNS AND INTERRUPTIONS

1.10.1. Contractor shall give the District a minimum of three (3) days written notice in advance of any need to shut off existing utility services or to effect equipment interruptions. District will set exact time and duration for shutdown, and will assist Contractor with shutdown. Work required to re-establish utility services shall be performed by the Contractor.

1.10.2. Contractor shall obtain District's written approval as indicated in the General Conditions in advance of deliveries of material or equipment or other activities that may conflict with District's use of the building(s) or adjacent facilities.

1.11. STRUCTURAL INTEGRITY

1.11.1. Contractor shall be responsible for and supervise each operation and work that could affect structural integrity of various building elements, both permanent and temporary.

1.11.2. Contractor shall include structural connections and fastenings as indicated or required for complete performance of the Work.

1.12. ENVIRONMENTAL REQUIREMENTS

1.12.1. To the extent possible, materials, processes, procedures, and equipment included in these Specifications shall comply with sustainable design practices.

END OF DOCUMENT

DOCUMENT 01 12 10

CONTRACT FORMS AND SUBMITTALS

1. GENERAL

1.1. RELATED DOCUMENTS AND PROVISIONS

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions;

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any);

1.1.4. Submittals; and

1.1.5. Construction Schedule.

2. REQUIREMENTS OF THE DISTRICT

2.1. Contractor shall utilize the District's forms as indicated below. This requirement also applies to submittals, including the requirement that the Contractor and its Subcontractors, as indicated, utilize the software, internet and specific programs on this Project as indicated herein.

2.2. CONTRACTOR SUBMITTALS

All submittals required by the Contract Documents shall be submitted using the programs, processes and software indicated below. If no specific program or format is indicated, then Microsoft Word or Microsoft Excel is acceptable.

2.2.1. **Preliminary Construction Schedule**

2.2.2. **Schedule of Values**

2.2.3. **Contractor's Completed Subcontractor List**

2.2.4. **Contractor's Safety Plan**

2.2.5. **Schedule of Submittals**

2.2.6. **Operations And Maintenance Manual and Instructions**

END OF DOCUMENT

DOCUMENT 01 20 00

PRICE AND PAYMENT PROCEDURES

1. GENERAL

1.1. RELATED DOCUMENTS AND PROVISIONS

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions;

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any).

1.2. DESCRIPTION

1.2.1. This Document contains procedures to be followed by the Contractor to request payment.

1.2.2. **IF THERE IS ANY INCONSISTENCY IN THIS DOCUMENT WITH THE PROVISIONS IN THE GENERAL CONDITIONS AND THE SPECIAL CONDITIONS THAT THE CONTRACTOR SHALL COMPLY WITH RELATED TO CHANGES AND/OR REQUESTS FOR CHANGES (e.g., "PAYMENTS," "SCHEDULE OF VALUES"), THOSE PROVISIONS IN THE GENERAL CONDITIONS AND THE SPECIAL CONDITIONS SHALL TAKE PRECEDENCE.**

1.3. SECTION INCLUDES

1.3.1. Schedule of Values.

1.3.2. Application for Payment.

1.4. SCHEDULE OF VALUES

1.4.1. Provide a breakdown of the Contract Price with enough detail to facilitate continued evaluation of Applications for Payment and Progress Reports.

1.4.2. Contractor must update and resubmit the Schedule of Values before the next Invoice or Application for Payment when Change Orders or Construction Change Directives result in a change in the Contract Price.

1.4.3. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule. Comply with the provisions in the General Conditions regarding the Schedule of Values.

1.4.3.1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including the following:

1.4.3.1.1. Application for Payment forms.

1.4.3.1.2. Submittal Schedule.

1.4.3.1.3. Contractor's Construction Schedule.

1.4.3.2. Submit the Schedule of Values to District as indicated in the Contract Documents and, if an updated Schedule of Values is needed, then no later than ten (10) days before the date scheduled for submittal of the next Application(s) for Payment.

1.4.3.3. Subschedules: Where the Work is separated into phases requiring separately phased payments, provide subschedules showing values correlated with each phase of payment.

1.4.4. Format and Content: Use the Project Manual table of contents as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section.

1.4.4.1. Identification: Include the following Project identification on the Schedule of Values:

1.4.4.1.1. Project name and location.

1.4.4.1.2. Name of District's Representative.

1.4.4.1.3. District's contract number (**22-519-03**).

1.4.4.1.4. District's name and address.

1.4.4.1.5. Date of submittal.

1.4.4.2. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:

1.4.4.2.1. Related Specification document, section or division.

1.4.4.2.2. Description of the Work.

1.4.4.2.3. Name of subcontractor.

1.4.4.2.4. Name of manufacturer or fabricator.

1.4.4.2.5. Name of supplier.

1.4.4.2.6. Change Orders (numbers) that affect value.

1.4.4.2.7. Dollar value.

1.4.4.2.7.1. Percentage of the Contract Price to nearest one-hundredth percent, adjusted to total 100 percent.

1.4.4.3. Provide a breakdown of the Contract Price in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Provide several line items for principal subcontract amounts, where appropriate. Include separate line items under required principal subcontracts for operation and maintenance manuals, punch list activities, Project Record Documents, and demonstration and training.

1.4.4.4. Round amounts to nearest whole dollar; total shall equal the Contract Price.

1.4.4.5. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.

1.4.4.6. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.

1.4.4.7. Allowances (if any): Provide a separate line item in the Schedule of Values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.

1.4.4.8. Each item in the Schedule of Values and Applications for Payments shall be complete. Include total cost and proportionate share of general overhead and profit for each item.

1.4.5. Schedule Updating: Update and resubmit the Schedule of Values before the next Application for Payment if there is a change in the Contract Price.

1.5. APPLICATIONS FOR PAYMENT

1.5.1. **Form:** Contractor shall utilize AIA Form G702 - Application and Certificate for Payment and AIA Form G703 - Continuation Sheet, or District-approved form with the same information as these AIA forms.

1.5.2. **Content and Format**: District shall use Schedule of Values for listing items in its Application for Payment.

1.5.3. Each Application for Payment shall be consistent with previous applications and payments as certified and paid for by District.

END OF DOCUMENT

DOCUMENT 01 21 00

ALLOWANCES

1. GENERAL

1.1. RELATED DOCUMENTS AND PROVISION

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions including without limitation, Contract Terms and Definitions;

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any).

1.1.4. Agreement;

1.1.5. Bid Form; and

1.2. SUMMARY

1.2.1. **THE SPECIFIC ALLOWANCES FOR THIS PROJECT ARE AS LISTED IN THE AGREEMENT.**

1.2.2. This Document includes administrative and procedural requirements governing Allowances.

1.2.3. Certain items are specified in the Contract Documents by Allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when additional information is available for evaluation. If necessary, additional requirements may be issued by Change Order or similar document.

1.3. SELECTION AND PURCHASE

1.3.1. At the earliest practical date after award of the Contract, Contractor shall advise District of the date when final selection and purchase of each product or system described by an Allowance must be completed to avoid delaying the Work.

1.3.2. At District's request, obtain proposals for each Allowance for use in making final selections. Include recommendations that are relevant to performing the Work.

1.3.3. Purchase products and systems selected by District from the designated supplier.

1.4. SUBMITTALS

1.4.1. Submit proposals for purchase of products or systems included in Allowances, in the form specified for Change Orders.

1.4.2. Submit invoices or delivery slips to show actual quantities of materials delivered to the Site for use in fulfillment of each Allowance.

1.4.3. Coordinate and process submittals for Allowance items in same manner as for other portions of the Work.

1.5. COORDINATION

Coordinate Allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

1.6. PAYMENT FOR ALLOWANCES

1.6.1. Allowance shall include all-inclusive cost to Contractor of specific products and materials under Allowance and Contractor may bill its time, materials, and other items in the identical structure as a Change Order.

1.7. UNUSED MATERIALS

1.7.1. Return unused materials purchased under an Allowance to manufacturer or supplier for credit to District, after installation has been completed and accepted.

1.7.2. If requested, prepare and deliver unused material for storage by District when it is not economically practical (as determined by District) to return the material for credit. If directed, deliver unused material to District's storage space. Otherwise, disposal of unused material is Contractor's responsibility.

2. EXECUTION

2.1. EXAMINATION

Examine products covered by an Allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

2.2. PREPARATION

Coordinate materials and their installation for each Allowance with related materials and installations to ensure that each Allowance item is completely integrated and interfaced with related work.

END OF DOCUMENT

DOCUMENT 01 23 00

ALTERNATES AND UNIT PRICING

1. ALTERNATES AND UNIT PRICES

1.1. RELATED DOCUMENTS AND PROVISIONS

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions;

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any);

1.1.4. Bid Form and Proposal; and

1.1.5. Instruction to Bidders.

2. ALTERNATES

2.1. DESCRIPTION

An amount proposed by Contractor and stated in its Bid Form for certain work defined in the Instruction to Bidders, Bid Form or Contract Documents that may be added to or deducted from the Base Bid amount. The acceptance or rejection of any of the alternates is strictly at the option of the District and subject to District's acceptance of Contractor's stated prices contained in this Proposal.

The cost or credit for each alternate is the net addition to or deduction from the Contract Price to incorporate the alternate into the Work. No other adjustments are made to the Contract Price.

2.2. GENERAL:

2.2.1. Coordination: Contractor shall modify or adjust adjacent work as necessary to completely integrate work of the alternate into the Project.

2.2.1.1. Include as part of each alternate, miscellaneous devices, accessories and similar items incidental to or required for a complete installation whether or not indicated as part of the alternate.

2.2.1.2. Include as part of each alternate, the costs of related coordination, modification, or adjustments.

2.2.2. If District accepts an alternate, Contractor shall perform the work of the alternate under the same conditions as other Work required by Contract Documents.

2.2.3. Notification: Immediately following award of the Contract, Contractor shall notify all of its Subcontractor(s) in writing of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.

2.2.4. Schedule of Alternates: A Schedule of Alternates is included at the end of this Document. Specifications referenced in the Schedule of Alternates contain requirements for materials necessary to achieve the Work described under each alternate.

3. UNIT PRICING

3.1. DESCRIPTION

An amount proposed by Contractor and stated in its Bid Form for certain work defined in the Instruction to Bidders and Bid Form that may be priced by unit. The acceptance or rejection of any of the unit prices is strictly at the option of the District and subject to District's acceptance of Contractor's stated prices contained in the Bid Form and may be subsequently negotiated prior to incorporation on Change Order(s).

3.2. GENERAL

Contractor shall completely state all required figures based on Unit Prices required in the Bid Form. Where scope of Work is decreased, all Work pertaining to the item, whether specifically stated or not, shall be omitted and where scope of Work is increased, all work pertaining to that item required to render same ready for use on the Project in accordance with intention of Drawings and Specifications shall be included in an agreed upon price amount.

3.3. UNIT PRICES

Furnish unit prices for each of the named items on a square foot, lineal foot, or per each basis, as requested and applicable. Unit prices shall include all labor, materials, services, profit, overhead, insurance, bonds, taxes, and all other incidental costs of Contractor, subcontractors, and supplier(s).

4. EXECUTION

4.1. SCHEDULE OF ALTERNATES

[INSERT SCHEDULE OF ALTERNATES, AS APPLICABLE]

END OF DOCUMENT

DOCUMENT 01 25 10

PRODUCT OPTIONS AND SUBSTITUTIONS

1. GENERAL

1.1. RELATED DOCUMENTS AND PROVISIONS

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions;

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any); and

1.1.4. Instructions to Bidders.

1.2. DOCUMENT INCLUDES

1.2.1. Product options.

1.2.2. Limitations on Substitutions.

1.2.3. Regulatory Requirements.

1.2.4. Substitution Representation.

1.2.5. Submittal Procedure.

1.2.6. District's Review.

1.3. DEFINITIONS

1.3.1. Requests for changes in products, materials, or equipment required by Contract Documents proposed by the Contractor prior to and after award of the Contract are considered requests for substitutions. Contractor must refer to the Instructions to Bidders, the General Conditions and the Special Conditions for limitations on when requests for substitution(s) are permitted on Project. The following are not considered substitutions:

1.3.1.1. Revisions to Contract Documents requested by the District or Architect.

1.3.1.2. Specified options of products, materials, and equipment included in Contract Documents.

1.3.2. Whenever in the Specifications any material, product, thing, or service is indicated or specified by grade, patent, or proprietary name, or by name of manufacturer, that Specification shall be deemed to be used for the purpose of facilitating the description of the material, product, thing, or service, and shall be deemed to be followed by the words "or equal," except:

1.3.2.1. When designated to match other material, product, thing, or service in use on a particular public improvement either completed or in the course of completion; or

1.3.2.2. When designated as a field test or experiment.

1.4. PRODUCT OPTIONS

1.4.1. **Products Specified by Reference Standards or by Description Only**: Any Product meeting those standards or description.

1.4.2. **Products Specified by Naming One or More Manufacturers with or without Provision for Substitution**: Products of manufacturers named and meeting specifications with substitution of Products or manufacturer only when submitted under provisions of this section.

1.5. LIMITATIONS ON SUBSTITUTIONS

1.5.1. The Bid shall be based upon the standards of quality established by those items of equipment and/or materials which are specifically identified in the Contract Documents.

1.5.2. Burden of proof of merit of requested substitution is the responsibility of the Contractor.

1.5.3. It is the sole responsibility of Contractor to submit the proper content of any requests for substitutions. Incomplete submittals will be rejected.

1.6. REGULATORY REQUIREMENTS

1.6.1. It shall be the responsibility of Contractor to obtain all regulatory approvals required for proposed substitutions.

1.6.2. All regulatory approvals shall be obtained for proposed substitutions prior to submittal of substitution request to Architect.

1.6.3. All costs incurred by the District in obtaining regulatory approvals for proposed substitutions to include the costs of the Architect and any authority having jurisdiction over the Project shall be reimbursed to the District. Costs of these services shall be reimbursed regardless of final acceptance or rejection of substitution.

1.6.4. Substitutions of materials or work procedures which affect the health, safety and welfare of the public shall have prior approval of the Division of the State Architect (DSA) field representative.

1.7. SUBSTITUTION REPRESENTATION

1.7.1. In submitting a request for substitution, Contractor makes the representation that:

1.7.2. Contractor has investigated the proposed substitution and determined that it meets or exceeds the quality level of the specified product;

1.7.3. Contractor has determined that all components of the proposed substitution are identical and fully interchangeable with the product name and number specified;

1.7.4. Contractor will provide the same warranty or guarantee for the substitution as for the specified product;

1.7.5. Contractor will coordinate installation and make changes to other work which may be required for the work to be completed with no additional cost to the District;

1.7.6. Contractor waives claims for additional cost or time extension which may subsequently become apparent; and

1.7.7. Contractor will reimburse District for the cost of District's and Architect's review or redesign services associated with substitution request.

1.8. SUBMITTAL PROCEDURE

1.8.1. Submit six (6) copies of each request.

1.8.2. Submit request using District's Substitution Request Form as indicated in Contract Forms and Submittals. Substitution requests that are not on District's required form shall be returned without review.

1.8.3. Limit each request to one proposed substitution.

1.8.4. Request to include sufficient data so that direct comparison of proposed substitution can be made.

1.8.5. Provide complete documentation for each request. Documentation shall include the following information, as appropriate, as a minimum:

1.8.5.1. Statement of cause for substitution request.

1.8.5.2. Identify product by specification section and article number.

1.8.5.3. Provide manufacturer's name, address, and phone number. List fabricators, suppliers, and installers as appropriate.

1.8.5.4. List similar projects where proposed substitution has been used, dates of installation and names of Architect and District.

1.8.5.5. List availability of maintenance services and replacement materials.

1.8.5.6. Documented or confirmation of regulatory approval.

1.8.5.7. Product data, including drawings and descriptions of products.

1.8.5.8. Fabrication and installation procedures.

1.8.5.9. Samples of proposed substitutions.

1.8.5.10. Itemized comparison of significant qualities of the proposed substitution with those of the product specified. Significant qualities may include size, weight, durability, performance requirements and visual effects.

1.8.5.11. Coordination information, including a list of changes or modifications needed to other items of work that will become necessary to accommodate proposed substitution.

1.8.5.12. Statement on the substitutions effect on the Construction Schedule.

1.8.5.13. Cost information including a proposal of the net reduction in cost to the Contract Price if the proposed substitution is accepted.

1.8.5.14. Certification that the substitution is equal to or better in every respect to that required by the Contract Documents and that substitution will perform adequately in the application intended.

1.8.5.15. Waiver of right to additional payment or time that may subsequently become necessary because of failure of substitution to perform adequately.

1.8.6. Inadequate warranty, vagueness of submittal, failure to meet specified requirements, or submittal of insufficient data will be cause for rejection of substitution request.

1.9. DISTRICT'S REVIEW

1.9.1. The District will accept or reject proposed substitution within a reasonable amount of time.

1.9.2. If a request is made prior to bid opening and the District has not completed its review, Contractor shall base its bid on the product specified only.

1.9.3. There shall be no claim for additional time for review of proposed substitutions.

1.9.4. Final acceptance of a substitution submitted prior to the date established for the receipt of bids will be in the form of an addendum.

END OF DOCUMENT

DOCUMENT 01 26 00

CONTRACT MODIFICATION PROCEDURES

1. GENERAL

1.1. RELATED DOCUMENTS AND PROVISIONS

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions;

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any);

1.1.4. Allowances;

1.1.5. Product Options and Substitutions; and

1.1.6. Project Coordination.

1.2. DESCRIPTION

1.2.1. This Document contains procedures to be followed by the Contractor to request changes in the Contract Time of the Contract Price.

1.2.2. **IF THERE IS ANY INCONSISTENCY IN THIS DOCUMENT WITH THE PROVISIONS IN THE GENERAL CONDITIONS AND THE SPECIAL CONDITIONS THAT THE CONTRACTOR SHALL COMPLY WITH RELATED TO CHANGES AND/OR REQUESTS FOR CHANGES (e.g., "Change in the Work"), THOSE PROVISIONS IN THE GENERAL CONDITIONS AND THE SPECIAL CONDITIONS SHALL TAKE PRECEDENCE.**

1.3. SUMMARY

This Document specifies administrative and procedural requirements for handling and processing Contract modifications.

1.4. CONSTRUCTION CHANGE DIRECTIVE

The District may, as provided by law, by Construction Directive and without invalidating the Contract, order changes in the Work consisting of additions, deletions, or other revisions.

1.5. PRICE REQUESTS

1.5.1. Do not consider Price Requests to be instructions either to stop work in progress or to execute the proposed change.

1.5.2. Within time specified in Price Request after receipt of Price Request, submit a quotation estimating cost adjustments to the Contract Price and the Contract Time necessary to execute the change.

1.5.2.1. 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.

1.5.2.2. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.

1.5.2.3. Include costs of labor and supervision directly attributable to the change.

1.5.2.4. 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.

1.6. PROPOSED CHANGE ORDERS

Contractor may propose changes by submitting a request for a change on District's Proposed Change Order form (PCO) to District.

1.6.1. 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.

1.6.2. Comply with Contract Document requirements if the proposed change requires substitution of one product or system for product or system specified.

END OF DOCUMENT

DOCUMENT 01 26 10

REQUESTS FOR INFORMATION

1. GENERAL

1.1. RELATED DOCUMENTS AND PROVISIONS

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions;

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any);

1.1.4. Documentation Requirements;

1.1.5. Electronic Data Transfer;

1.1.6. Submittals;

1.1.7. Contract Closeout and Final Cleaning;

1.1.8. Operation and Maintenance Data;

1.1.9. Warranties; and

1.1.10. Record Documents;

1.2. DESCRIPTION

This Document contains procedures to be followed by the Contractor to request Architect provide additional information necessary to clarify or amplify an item in the Contract Documents that Contractor thinks 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.

1.3. PROCEDURES

1.3.1. Notification by Contractor:

1.3.1.1. Submit all requirements for clarification or additional information, whether originated by the Contractor, a Subcontractor, or supplier at any tier, in writing to District as required by the Contract Documents.

1.3.1.2. Number RFIs sequentially. Follow RFI number with sequential alphabetical suffix as necessary for each resubmission. For example, the first RFI would be "001." The second RFI would be "002."

1.3.1.3. All RFIs 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.

1.3.1.4. Limit each RFI to one subject.

1.3.1.5. Submit a RFI if one of the following conditions occurs:

1.3.1.5.1. Contractor discovers an unforeseen condition or circumstance that is not described in the Contract Documents.

1.3.1.5.2. Contractor discovers an apparent conflict or discrepancy between portions of the Contract Documents that appears to be inconsistent or is not reasonably inferred from the intent of the Contract Documents.

1.3.2. Contractor shall not:

1.3.2.1. Submit an RFI as a request for substitution.

1.3.2.2. Submit an RFI as a submittal.

1.3.2.3. Submit an RFI without first having thoroughly reviewed the Contract Documents.

1.3.2.4. Submit an RFI in a manner that suggests that specific portions of the Contract Documents are assumed to be excluded or by taking an isolated portion of the Contract Documents in part rather than whole.

1.3.2.5. Submit an RFI in an untimely manner without proper coordination and scheduling of Work related trades.

1.3.2.6. If Contractor submits an RFI contrary to the above, Contractor shall pay the cost of any review, which cost shall be deducted from the Contract Price.

1.3.3. 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:

1.3.3.1. Does not reflect adequate or competent supervision or coordination by the Contractor or any Subcontractor; or

1.3.3.2. Does not reflect the Contractor's adequate or competent knowledge of the requirements of the Work or the Contract Documents;

1.3.3.3. Requests an interpretation or decision of a matter where the information sought is equally available to the Contractor; or

1.3.3.4. Is not justified for any other reason.

1.4. RESPONSE TIME

1.4.1. Architect shall review RFIs and issue a response and instructions to Contractor within a reasonable time frame from the date the RFI is received and dated by the District.

1.4.2. Responses from the District will not change any requirement of the Contract unless so noted by the District in the response to the RFI. Should the Contractor contend that a response to an RFI causes a change to the Contract that requires a Change Order, the Contractor shall, before proceeding, give written notice to the District, indicating that the

Contractor considers the District's response to the RFI to be a Change Order, as required by the Contract Documents.

1.4.3. Should Contractor direct its Subcontractors to proceed with the Work affected before receipt of a response from Architect, any portion of the Work which is not done in accordance with the Architect's ultimate interpretations, clarifications, instructions, or decisions is subject to removal or replacement at Contractor's sole expense and responsibility.

END OF DOCUMENT

DOCUMENT 01 31 00

COORDINATION AND PROJECT MEETINGS

1. GENERAL

1.1. RELATED DOCUMENTS AND PROVISIONS:

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions;

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any); and

1.1.4. Technical Specifications.

1.2. SECTION INCLUDES

1.2.1. Coordination Responsibilities of the Contractor.

1.2.2. Field Engineering Responsibilities of the Contractor.

1.2.3. Preconstruction Conference.

1.2.4. Progress Meetings.

1.2.5. Pre-Installation Conferences.

1.2.6. Post Construction Dedication.

1.3. COORDINATION RESPONSIBILITIES OF THE CONTRACTOR

1.3.1. Coordinate scheduling, submittals, and Work of the Specifications to assure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

1.3.2. Prior to commencement of a particular type or kind of Work examine relevant information, contract documents, and subsequent data issued to the Project.

1.3.3. Verify that utility requirement characteristics of operating equipment are compatible with building utilities. Coordinate Work of various sections having interdependent responsibilities for installing, connecting to, and placing in service such equipment.

1.3.4. Closing up of holes, backfilling, and other covering up operations shall not proceed until all enclosed or covered Work and inspections have been completed. Verify before proceeding.

1.3.5. Coordinate space requirements and installation of mechanical and electrical Work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit as closely as practicable; place runs parallel with line of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

1.3.6. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

1.3.7. In locations where several elements of mechanical and electrical Work must be sequenced and positioned with precision in order to fit into available space, prepare coordination drawings showing the actual conditions required for the installation. Prepare coordination drawings prior to purchasing, fabricating, or installing any of the elements required to be coordinated.

1.3.8. Closing up of walls, partitions or furred spaces, backfilling, and other covering up operations shall not proceed until all enclosed or covered Work and inspections have been completed. Verify before proceeding.

1.3.9. Coordinate completion and cleanup of Work of separate sections in preparation for completion and for portions of Work designated for District's occupancy.

1.3.10. After District occupancy of Project, coordinate access to Site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of District's activities.

1.3.11. Coordinate all utility company Work in accordance with the Contract Documents.

1.3.12. Key Personnel Names: Within fifteen (15) days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project. Post copies of list in Project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

1.4. FIELD ENGINEERING RESPONSIBILITIES OF THE CONTRACTOR

1.4.1. Contractor shall employ a Land Surveyor registered in the State of California and acceptable to the Architect.

1.4.2. Control datum for survey is that established by District provided survey. Contractor to locate and protect survey control and reference points.

1.4.3. Replace dislocated survey control points based on original survey control.

1.4.4. Provide field engineering services. Establish elevations, lines, and levels utilizing recognized engineering survey practices.

1.4.5. Upon completion of Work, submit certificate signed by the Land Surveyor that elevations and locations of Work are in conformance with Contract Documents. Record deviations on Record Drawings.

1.5. PRECONSTRUCTION CONFERENCE

1.5.1. Construction Manager or Project Engineer will schedule a conference immediately after, and in no case more than fifteen (15) days after, receipt of fully executed Contract Documents prior to Project mobilization.

1.5.2. Mandatory Attendance: Construction Manager, Project Engineer, Inspector of Record,

Architect of Record, Contractor, Contractor's Project Manager, and Contractor's Job/Project Superintendent.

1.5.3. Optional Attendance: Architect's consultants, and utility company representatives.

1.5.4. Construction Manager shall preside at conference and the Project Architect shall prepare and record minutes and distribute copies.

1.5.5. Agenda:

1.5.5.1. Execution of Owner-Contractor Agreement.

1.5.5.2. Issue Notice to Proceed.

1.5.5.3. Submission of executed bonds and insurance certificates.

1.5.5.4. Distribution of Contract Documents.

1.5.5.5. Submission of list of Subcontractors, list of Products, Schedule of Values, and Progress Schedule.

1.5.5.6. Designation of responsible personnel representing the parties.

1.5.5.7. Procedures for processing Change Orders.

1.5.5.8. Procedures for Request for Information.

1.5.5.9. Procedures for testing and inspecting.

1.5.5.10. Procedures for processing applications for payment.

1.5.5.11. Procedures for Project closeout.

1.5.5.12. Use of Premises.

1.5.5.13. Work restrictions.

1.5.5.14. District’s occupancy requirements or options.

1.5.5.15. Responsibility for temporary facilities and controls.

1.5.5.16. Construction waste management and recycling.

1.5.5.17. Parking availability.

1.5.5.18. Office, work and storage areas.

1.5.5.19. Equipment deliveries and priority.

1.5.5.20. Security.

1.5.5.21. Progress cleaning.

1.5.5.22. Review required submittals and (if applicable) LEED Certification requirements.

1.6. PROGRESS MEETINGS

1.6.1. Construction Manager shall schedule and administer meetings throughout progress of the Work at a minimum of every week.

1.6.2. Construction Manager or Project Engineer will make arrangements for meetings, prepare agenda, and preside at meetings. Project Architect shall record minutes (Field Reports), and distribute copies.

1.6.3. Attendance Required: Job Superintendent, Construction Manager, Project Engineer, Project Inspector, Architect of Record, Subcontractors, and suppliers as appropriate to agenda topics for each meeting.

1.6.4. Agenda:

1.6.4.1. Review minutes of previous meetings (Field Reports).

1.6.4.2. Review of Work progress.

1.6.4.3. Field observations, problems, and decisions.

1.6.4.4. Identification of problems which impede planned progress.

1.6.4.5. Review of submittals schedule and status of submittals.

1.6.4.6. Review of off-site fabrication and delivery schedules.

1.6.4.7. Maintenance of construction schedule.

1.6.4.8. Corrective measures to regain projected schedules.

1.6.4.9. Planned progress during succeeding work period.

1.6.4.10. Coordination of projected progress.

1.6.4.11. Maintenance of quality and work standards.

1.6.4.12. Effect of proposed changes on progress schedule and coordination.

1.6.4.13. Other business relating to Work.

1.6.5. District has authority to schedule mandatory meetings other than those listed, as necessary.

1.7. PRE-INSTALLATION CONFERENCES

1.7.1. When required in individual specification section, Contractor shall convene a pre-installation conference prior to commencing Work of the section. Refer to individual specification section for timing requirements of conference.

1.7.2. Contractor shall require its Subcontractors and suppliers directly affecting, or affected by, Work of the specific section to attend.

1.7.3. Notify the Construction Manager, Project Engineer, Inspector of Record, and Architect of Record four (4) days in advance of meeting date.

1.7.4. A pre-installation conference may coincide with a regularly scheduled progress meeting.

1.7.5. Contractor shall prepare agenda, preside at conference, record minutes, and distribute copies within two (2) days after conference to participants.

1.7.6. The purpose of the meeting will be to review Contract Documents, conditions of installation, preparation and installation procedures, and coordination with related Work and manufacturer's recommendations.

1.7.7. Pre-installation Schedule: As a minimum, Work being installed under the Contract Documents technical sections will require pre-installation conferences. Contractor shall review the technical specifications and add all additional requirements for pre-installation meetings contained in those sections.

1.8. POST CONSTRUCTION DEDICATION

1.8.1. Attendance Required: Project Superintendent, Contractor, Project Manager, major Subcontractors, Construction Manager, Project Engineer, Project Inspector, and Architect of Record.

1.8.2. Preparation prior to Dedication: Contractor and appropriate Subcontractors and suppliers shall:

1.8.3. Assist District in operation of mechanical devices and systems.

1.8.3.1. Verify operation and adjust controls for communication systems.

1.8.3.2. Assist District in operation of lighting systems.

END OF DOCUMENT

DOCUMENT 01 32 16

CONSTRUCTION SCHEDULE – NETWORK ANALYSIS

1. GENERAL

1.1. RELATED DOCUMENTS AND PROVISION

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions;

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any);

1.1.4. Coordination and Meetings; and

1.1.5. Submittals.

1.2. REFERENCES

1.2.1. Construction Planning and Scheduling Manual - A Manual for General Contractors and the Construction Industry, The Associated General Contractors of America (AGC).

1.2.2. CSI - Construction Specifications Institute MP-2-1 Master Format.

1.2.3. U.S. National Weather Service - Local Climatological Data.

1.3. PERFORMANCE REQUIREMENTS

1.3.1. Ensure adequate scheduling during construction activities so Work may be prosecuted in an orderly and expeditious manner within stipulated Contract Time.

1.3.2. Ensure coordination of Contractor and Subcontractors at all levels.

1.3.3. Ensure coordination of submittals, fabrication, delivery, erection, installation, and testing of products, materials and equipment.

1.3.4. Ensure on-time delivery of District furnished products, materials and equipment.

1.3.5. Ensure coordination of jurisdictional reviews.

1.3.6. Prepare applications for payment.

1.3.7. Monitor progress of Work.

1.3.8. Prepare proper requests for changes to Contract Time.

1.3.9. Prepare proper requests for changes to Construction Schedule.

1.3.10. Assist in detection of schedule delays and identification of corrective actions.

1.4. QUALITY ASSURANCE

1.4.1. Perform scheduling work in accordance with Construction Planning and Scheduling Manual published by the AGC.

1.4.2. Maintain one copy of Construction Planning and Scheduling Manual on Site.

1.4.3. In the event of discrepancy between the AGC publication and the Contract Documents, provisions of the Contract Documents shall govern.

1.5. QUALIFICATIONS

1.5.1. **Scheduler**:

1.5.1.1. Contractor shall retain a construction scheduler to work in enough capacity to perform all of the Contractor's requirements to prepare the Construction Schedule. The Scheduler shall plan, coordinate, execute, and monitor a cost/resource loaded CPM schedule as required for Project and have a minimum of five (5) years direct experience using Primavera Project Management.

1.5.1.2. Scheduler will cooperate with District and shall be available on site for monitoring, maintaining and updating schedules in a timely manner.

1.5.1.3. District has the right to reject the Scheduler based upon a lack of experience as required by this Document or based on lack of performance and timeliness of schedule submittals/fragnets on past projects. Contractor shall within seven (7) calendar days of District's rejection, propose another scheduler who meets the experience requirements stated above.

1.5.2. **Administrative Personnel**: Five (5) years minimum experience in using and monitoring schedules on comparable projects.

1.6. SUBMITTALS

1.6.1. Submit Short Interval Schedule at each Construction Progress Meeting.

1.6.2. Submit Time Adjustment Schedule within five (5) days of commencement of a claimed delay.

1.6.3. Submit Recovery Schedules as required for timely completion of Work or when demanded by the District.

1.6.4. Submit job cost reports when demanded by the District.

1.6.5. Submit one (1) reproducible and two (2) copies of each schedule and cost report.

1.7. REVIEW AND EVALUATION

1.7.1. Contractor shall participate in joint review of Construction Schedule and Reports with District and Architect.

1.7.2. Within seven (7) days of receipt of District and/or Architect's comments provide satisfactory revision to Construction Schedule or adequate justification for activities in question.

1.7.3. In the event that an activity or element of Work is not detected by District or Architect review, such omission or error shall be corrected by next scheduled update and shall not affect Contract Time.

1.7.4. Acceptance by District of corrected Construction Schedule shall be a condition precedent to making any progress payments.

1.7.5. Cost-loaded values of Construction Schedule shall be basis for determining progress payments.

1.7.6. Review and acceptance by District and Architect of Preliminary Construction Schedule or Construction Schedule does not constitute responsibility whatsoever for accuracy or feasibility of schedules nor does such acceptance expressly or impliedly warrant, acknowledge or admit reasonableness of activities, logic, duration, manpower, cost or equipment loading stated or implied on schedules.

1.8. FORMAT

1.8.1. Prepare diagrams and supporting mathematical analyses using Precedence Diagramming Method, under concepts and methods outlined in AGC Construction Planning and Scheduling Manual, or other method pre-approved by District.

1.8.2. **Listings**: Reading from left to right, in ascending order for each activity.

1.8.3. **Diagram Size**: 42 inches maximum height x width required.

1.8.4. **Scale and Spacing**: To allow for legible notations and revisions.

1.8.5. Illustrate order and interdependence of activities and sequence of Work.

1.8.6. Illustrate complete sequence of construction by activity.

1.8.7. Provide legend of symbols and abbreviations used.

1.9. COST AND SCHEDULE REPORTS

1.9.1. **Activity Analysis**: Tabulate each activity of network diagram and identify for each activity:

1.9.1.1. Description.

1.9.1.2. Interface with outside contractors or agencies.

1.9.1.3. Number.

1.9.1.4. Preceding and following number.

1.9.1.5. Duration.

1.9.1.6. Earliest start date.

1.9.1.7. Earliest finish date.

1.9.1.8. Actual start date.

1.9.1.9. Actual finish date.

1.9.1.10. Latest start date.

1.9.1.11. Latest finish date.

1.9.1.12. Total and free float.

1.9.1.13. Identification of critical path activity.

1.9.1.14. Monetary value keyed to Schedule of Values.

1.9.1.15. Manpower requirements.

1.9.1.16. Responsibility.

1.9.1.17. Percentage complete.

1.9.1.18. Variance positive or negative.

1.9.2. **Cost Report**: Tabulate each activity of network diagram and identify for each activity:

1.9.2.1. Description.

1.9.2.2. Number.

1.9.2.3. Total cost.

1.9.2.4. Percentage complete.

1.9.2.5. Value prior to current period.

1.9.2.6. Value this period.

1.9.2.7. Value to date.

1.9.3. **Required Sorts**: List activities in sorts or groups:

1.9.3.1. By activity number.

1.9.3.2. By amount of float time in order of early start.

1.9.3.3. By responsibility in order of earliest start date.

1.9.3.4. In order of latest start dates.

1.9.3.5. In order of latest finish dates.

1.9.3.6. Application for payment sorted by Schedule of Values.

1.9.3.7. Listing of activities on critical path.

1.9.4. Listing of basic input data which generates schedule.

1.10. CONSTRUCTION SCHEDULE

1.10.1. Contractor shall develop and submit a cost loaded preliminary schedule of construction (or Preliminary Construction Schedule) as required by this Document and the Contract Documents. It shall be submitted in computer generated network format and shall be organized by Activity Codes representing the intended sequencing of the Work, and with time scaled network diagrams of activities. The Preliminary Construction Schedule shall include activities such as mobilization, preparation of submittals, specified review periods, procurement items, fabrication items, milestones, and all detailed construction activities.

1.10.2. Upon District's acceptance of the Preliminary Construction Schedule, Contractor shall update the accepted Preliminary Construction Schedule until Contractor's Construction Schedule is fully developed and accepted. Since updates to the Construction Schedule are the basis for payment to Contractor, submittal and acceptance of the Construction Schedule and updates shall be a condition precedent to making of monthly payments, as indicated in the General Conditions.

1.10.3. Failure to submit an adequate or accurate Preliminary Construction Schedule, Construction Schedule, updates thereto or failure to submit on established dates, will be considered a breach of Contract.

1.10.4. Failure to include any activity shall not be an excuse for completing all Work by required Completion Date.

1.10.5. Activities of long intervals shall be broken into increments no longer than fourteen (14) days or a value over Twenty Thousand Dollars ($20,000.00), unless approved by the District or it is a non-construction activity for procurement and delivery.

1.10.6. The Construction Schedule shall comply with the following and include the following:

1.10.6.1. Provide a written narrative describing Contractor's approach to mobilization, procurement, and construction during the first thirty (30) calendar days including crew sizes, equipment and material delivery, Site access, submittals, and permits.

1.10.6.2. Shall designate critical path or paths.

1.10.6.3. Procurement activities to include mobilization, shop drawings and sample submittals.

1.10.6.4. Identification of key and long-lead elements and realistic delivery dates.

1.10.6.5. Construction activities in units of whole days limited to fourteen (14) days for each activity except non-construction activities for procurement and delivery.

1.10.6.6. Approximate cost and duration of each activity.

1.10.6.7. Shall contain seasonal weather considerations.

1.10.6.8. Indicate a date for Project Completion that is no later than Completion Date subject to any time extensions processed as part of a Change Order.

1.10.6.9. Conform to mandatory dates specified in the Contract Documents.

1.10.6.10. Contractor shall allow for inclement weather in the Proposed Baseline Schedule by incorporating an activity titled "Rain Day Impact Allowance" as the last activity prior to the Completion Milestone. No other activities may be concurrent with it. The duration of the Rain Day Impact Allowance activity will be in accordance with the Special Conditions, and will be calculated from the Notice to Proceed until the Completion.

1.10.6.11. Level of detail shall correspond to complexity of work involved.

1.10.6.12. Indicate procurement activities, delivery, and installation of District furnished material and equipment.

1.10.6.13. Designate critical path or paths.

1.10.6.14. Subcontractor work at all levels shall be included in schedule.

1.10.6.15. As developed, shall show sequence and interdependence of activities required for complete performance of Work.

1.10.6.16. Shall be logical and show a coordinated plan of Work.

1.10.6.17. Show order of activities and major points of interface, including specific dates of completion.

1.10.6.18. Duration of activities shall be coordinated with Subcontractors and suppliers and shall be best estimate of time required.

1.10.6.19. Shall show description, duration and float for each activity.

1.10.7. **Activity.** An activity shall meet the following criteria:

1.10.7.1. Any portion or element of Work, action, or reaction that is precisely described, readily identifiable, and is a function of a logical sequential process.

1.10.7.2. Descriptions shall be clear and concise. Beginning and end shall be readily verifiable. Starts and finishes shall be scheduled by logical restraints.

1.10.7.3. Responsibility shall be identified with a single performing entity.

1.10.7.4. Additional codes shall identify building, floor, bid opening and/or District's receipt of proposals, whichever is acceptable and CSI classification.

1.10.7.5. Assigned dollar value (cost-loading) of each activity shall cumulatively equal total contract amount. Mobilization, bond and insurance costs

shall be separate. General requirement costs, overhead, profit, shall be prorated throughout all activities. Activity costs shall correlate with Schedule of Values.

1.10.7.6. Each activity shall have manpower-loading assigned.

1.10.7.7. Major construction equipment shall be assigned to each activity.

1.10.7.8. Activities labeled start, continue or completion are not allowed.

1.10.8. **Equipment and Materials.** For major equipment and materials show a sequence of activities including:

1.10.8.1. Preparation of shop drawings and sample submissions.

1.10.8.2. Review of shop drawings and samples.

1.10.8.3. Finish and color selection.

1.10.8.4. Fabrication and delivery.

1.10.8.5. Erection or installation.

1.10.8.6. Testing.

1.10.9. Include a minimum of fifteen (15) days prior to Completion Date for punch lists and clean up. No other activities shall be scheduled during this period.

1.11. SHORT INTERVAL SCHEDULE

1.11.1. The Four-Week Rolling Schedule shall be based on the most recent District Accepted Construction Schedule or Update. It shall include weekly updates to all construction, submittal, fabrication/procurement, and separate Work Contract activities. Contractor shall ensure that it accurately reflects the current progress of the Work.

1.11.2. Shall be fully developed horizontal bar-chart-type schedule directly derived from Construction Schedule.

1.11.3. Prepare schedule on sheet of sufficient width to clearly show data.

1.11.4. Provide continuous heavy vertical line identifying first day of week.

1.11.5. Provide continuous subordinate vertical line identifying each day of week.

1.11.6. Identify activities by same activity number and description as Construction Schedule.

1.11.7. Show each activity in proper sequence.

1.11.8. Indicate graphically sequences necessary for related activities.

1.11.9. Indicate activities completed or in progress for previous two (2) week period.

1.11.10. Indicate activities scheduled for succeeding three (3) week period.

1.11.11. Further detail should be added if necessary to monitor schedule or if requested by District.

1.12. REQUESTED TIME ADJUSTMENT SCHEDULE

1.12.1. Updated Construction Schedule shall not show a Completion Date later than the Contract Time, subject to any time extensions processed as part of a Change Order.

1.12.2. If an extension of time is requested, a separate schedule entitled "Requested Time Adjustment Schedule" shall be submitted to District and Architect.

1.12.3. Indicate requested adjustments in Contract Time which are due to changes or delays in completion of Work.

1.12.4. Extension request shall include forecast of Project Completion date and actual achievement of any dates listed in Contract Documents.

1.12.5. To the extent that any requests are pending at time of any Construction Schedule update, Time Adjustment Schedule shall also be updated.

1.12.6. Schedule shall be a time-scaled network analysis.

1.12.7. Accompany schedule with formal written time extension request and detailed impact analysis justifying extension.

1.12.8. Time impact analysis shall demonstrate time impact based upon date of delay, and status of construction at that time and event time computation of all affected activities. Event times shall be those as shown in latest Construction Schedule.

1.12.9. Activity delays shall not automatically constitute an extension of Contract Time.

1.12.10. Failure of Subcontractors shall not be justification for an extension of time.

1.12.11. Float is not for the exclusive use or benefit of any single party. Float time shall be apportioned according to needs of Project, as determined by the District.

1.12.12. Float suppression techniques such as preferential sequencing, special lead/lag logic restraints, extended activity durations, or imposed dates shall be apportioned according to benefit of Project.

1.12.13. Extensions will be granted only to extent that time adjustments to activities exceed total positive float of the critical path and extends Completion date.

1.12.14. District shall not have an obligation to consider any time extension request unless requirements of Contract Documents, and specifically, but not limited to these requirements, are complied with.

1.12.15. District shall not be responsible or liable for any construction acceleration due to failure of District to grant time extensions under Contract Documents should requested adjustments in Contract Time not substantially comply with submission and justification requirements of Contract for time extension requests.

1.12.16. In the event a Requested Time Adjustment Schedule and Time Impact Analysis are not submitted within ten (10) days after commencement of a delay it is mutually agreed that delay does not require a Contract Time extension.

1.13. RECOVERY SCHEDULE

1.13.1. When activities are behind Construction Schedule a supplementary Recovery Schedule shall be submitted.

1.13.2. Contractor shall prepare and submit to the District a Recovery Schedule whenever activities are behind Construction Schedule or at any time requested by the District, at no cost to the District.

1.13.3. Form and detail shall be sufficient to explain and display how activities will be rescheduled to regain compliance with Construction Schedule and to complete the Work by the Completion Date.

1.13.4. Maximum duration shall be one (1) month and shall coincide with payment period.

1.13.5. Ten (10) days prior to expiration of Recovery Schedule, Contractor shall have to show verification to determine if activities have regained compliance with Construction Schedule. Based upon this verification the following will occur:

1.13.5.1. Supplemental Recovery Schedule will be submitted to address subsequent payment period.

1.13.5.2. Construction Schedule will be resumed.

1.14. UPDATING SCHEDULES

1.14.1. Review and update schedules at least ten (10) days prior to submitting an Application for Payment.

1.14.2. Maintain schedules to record actual prosecution and progress.

1.14.3. Approved Change Orders which affect schedules shall be identified as separate new activities.

1.14.4. Change Orders of less than $5,000.00 value or less than three (3) days duration need not be shown unless critical path is affected.

1.14.5. No other revisions shall be made to schedules unless authorized by District.

1.14.6. **Schedule Narrative Report**: Contractor shall include a written report to explain the Monthly Schedule Update. The narrative shall, at a minimum, include the following headings with appropriate discussions of each topic:

1.14.6.1. Activities or portions of activities completed during previous reporting period.

1.14.6.2. Actual start dates for activities currently in progress.

1.14.6.3. Deviations from critical path in days ahead or behind.

1.14.6.4. List of major construction equipment used during reporting period and any equipment idle.

1.14.6.5. Number of personnel by trade engaged on Work during reporting period.

1.14.6.6. Progress analysis describing problem areas.

1.14.6.7. Current and anticipated delay factors and their impact.

1.14.6.8. Proposed corrective actions and logic revisions for Recovery Schedule.

1.14.6.9. Proposed modifications, additions, deletions and changes in logic of Construction Schedule.

1.14.6.10. In updating the Schedule, Contractor shall not modify Activity ID numbers, schedule calculation rules/criteria, or the Activity Coding Structure required.

1.14.7. Schedule update will form basis upon which progress payments will be made.

1.14.8. District will not be obligated to review or process Application for Payment until the Construction Schedule and Schedule Narrative Report have been submitted.

1.15. DISTRIBUTION

1.15.1. Following joint review and acceptance of updated schedules distribute copies to District, Architect, and all other concerned parties.

1.15.2. Instruct recipients to promptly report in writing any problem anticipated by projections shown in schedules.

2. PRODUCTS

2.1. SCHEDULING SOFTWARE

Contractor shall utilize the Critical Path Method (CPM) in the development and maintenance of the Construction Schedule. The scheduling software shall be capable of being resource loaded with manpower, costs and materials. It shall also be capable of generating time-scaled logic diagrams, resource histograms and profiles, bar charts, layouts and reports with any and/or all activity detail.

2.2. ELECTRONIC DATA

Provide compact disk(s) that contain a back-up of the Proposed Baseline Schedule data on it.

END OF DOCUMENT

DOCUMENT 01 33 00

SUBMITTALS

1. GENERAL

1.1. RELATED DOCUMENTS AND PROVISION

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions;

1.1.2. Special Conditions;

1.1.3. Instructions to Bidders;

1.1.4. Summary of Work;

1.1.5. Contract Forms and Submittals;

1.1.6. Product Options and Substitutions;

1.1.7. Requests for Information;

1.1.8. Contract Closeout and Final Cleaning;

1.1.9. Operation and Maintenance Data;

1.1.10. Warranties;

1.1.11. Record Documents;

1.1.12. Demonstration and Training;

1.2. DOCUMENT INCLUDES

1.2.1. Submittal procedures – Use of Primavera.

1.2.2. Shop drawings.

1.2.3. PCM (or other pre-approved program) Electronic Submittal Process

1.2.4. Product data.

1.2.5. Samples.

1.2.6. Manufacturers' Instructions.

1.2.7. Manufacturers' Certificates.

1.2.8. Mock-Up.

1.2.9. Deferred approval requirements.

1.3. SUBMITTAL PROCEDURES – USE OF PRIMAVERA OR ANOTHER PRE-APPROVED PROGRAM

1.3.1. Contractor shall utilize for the submittal process **Primavera P6 Project Management® software (latest version) by Oracle (PCM)** or another program if pre-approved by the District**.**

1.3.2. Contractor shall transmit each submittal in conformance with requirements of this Document. For each submittal, Contractor shall:

1.3.2.1. Sequentially number the transmittal forms. Resubmitted submittals must have the original number with an alphabetic suffix;

1.3.2.2. Identify Project and Architect's project number, Contractor, Subcontractor or supplier; pertinent Drawing sheet and detail number(s), and specification Section number, as appropriate;

1.3.2.3. Apply Contractor's stamp, signed or initialed certifying that review, verification of Products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the Work and Contract Documents. Submittals without Contractor's stamp and signature will be returned without review.

1.3.3. Coordinate preparation and processing of submittals with performance of Work. Transmit each submittal sufficiently in advance of performance of Work to avoid delay.

1.3.3.1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.

1.3.3.2. Coordinate transmittal of different types of submittals for related parts of Work so processing will not be delayed because of the need to review submittals concurrently for coordination.

1.3.3.3. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

1.3.4. Comply with Contract Documents for list of submittals and time requirements for scheduled performance of Work.

1.3.5. No extension of Contract Time will be authorized because of failure to transmit submittals to the Architect sufficiently in advance of the Work to permit processing.

1.3.6. Identify variations from Contract Documents and Product or system limitations which may be detrimental to successful performance of the completed Work.

1.3.7. Provide space for Contractor and Architect review stamps.

1.3.8. Revise and resubmit submittals as required, identify all changes made since previous submittal.

1.3.9. Distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions.

1.3.10. Submittals not requested will not be recognized or processed. Submittals not requested will be returned without review.

1.4. SHOP DRAWINGS

1.4.1. Prepare Project-specific information, drawn accurately to scale. Do not reproduce Contract Documents or copy standard information as the basis of shop drawings. Standard information prepared without specific reference to the Project is not a shop drawing.

1.4.2. Do not use or allow others to use Shop Drawings which have been submitted and have been rejected.

1.4.3. Preparation: Fully illustrate requirements in Contract Documents. Include the following information, as applicable:

1.4.3.1. Dimensions.

1.4.3.2. Identification of products.

1.4.3.3. Fabrication and installation drawings.

1.4.3.4. Roughing-in and setting diagrams.

1.4.3.5. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.

1.4.3.6. Shopwork manufacturing instructions.

1.4.3.7. Templates and patterns.

1.4.3.8. Schedules.

1.4.3.9. Design calculations.

1.4.3.10. Compliance with specified standards.

1.4.3.11. Notation of coordination requirements.

1.4.3.12. Notation of dimensions established by field measurements.

1.4.3.13. Relationship to adjoining construction clearly indicated.

1.4.3.14. Seal and signature of professional engineer if specified.

1.4.3.15. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.

1.4.3.16. All deviations from the Contract Documents, clearly indicated.

1.4.3.17. Copy of letter indicating acceptance of deviations indicated on the submittal.

1.4.4. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm) but no larger than 30 by 40 inches (750 by 1000 mm).

1.4.5. Do not use Shop Drawings without an appropriate final stamp from the Contractor and District indicating action taken in connection with construction.

1.4.6. Deviations from Contract Documents require specific written acceptance by the District of the noted deviation and clear indication on the submittal.

1.5. ELECTRONIC SUBMITTAL PROCESS

1.5.1. Submittal Procedure for Large Format Shop Drawings.

1.5.1.1. Contractor shall provide six (6) paper copies of the large format Shop Drawings directly to the District and the Construction Manager (CM) and Contractor will upload/post an electronic transmittal (with a detailed description of the submittal including the subject, specification number and number of drawings) on PCM (or other pre-approved program).

1.5.1.2. Contractor shall verify that the Schedule of Submittals and all submittal log(s) on PCM (or other pre-approved program) are accurate and up to date.

1.5.1.3. The District and Architect will review and markup each Submittal and provide changes to Contractor for Contractor's incorporation into the Submittal.

1.5.1.4. This process will continue until the Contractor has provided a Submittal that is acceptable to the District and the Architect.

1.5.1.5. Once a Submittal is accepted, the District will provide a final accepted Submittal to the Contractor and the Contractor will closeout that one Submittal.

1.5.1.6. Contractor shall send one (1) copy of the completed record submittal of the large format documents to a vendor (Ford Graphics is suggested) for scanning and posting on PCM (or other pre-approved program).

1.5.2. Product Data, Calculations and Small Format Drawings

1.5.2.1. Contractor shall upload/post one (1) electronic copy (from manufacturer's website or pre-scanned) of the product literature, data, calculations, and/or small format shop drawings to PCM (or other pre-approved program) with a Transmittal (with a detailed description of the submittal) directly to the CM.

1.5.2.2. The District and Architect will review and markup each Submittal and provide changes to Contractor for Contractor's incorporation into the Submittal.

1.5.2.3. This process will continue until the Contractor has provided a Submittal that is acceptable to the District and the Architect.

1.5.2.4. Once a Submittal is accepted, the District will provide a final accepted Submittal to the Contractor and the Contractor will closeout that one Submittal.

1.5.2.5. Contractor shall send one (1) copy of the completed record submittal of the large format documents to a vendor (Ford Graphics is suggested) for scanning and posting on PCM (or other pre-approved program).

1.5.3. Sample Submittal Procedure – (Product / Assembly Samples)

1.5.3.1. Contractor shall provide four (4) physical samples directly to the District and the CM and Contractor will upload/post an electronic transmittal (with a detailed description of the submittal including the subject, specification number and

number of drawings) on PCM (or other pre-approved program).

1.5.3.2. The District and Architect will review and markup each Submittal and provide changes to Contractor for Contractor's incorporation into the Submittal.

1.5.3.3. This process will continue until the Contractor has provided a Submittal that is acceptable to the District and the Architect.

1.5.3.4. Once a Submittal is accepted, the District will provide a final accepted Submittal to the Contractor and the Contractor will closeout that one Submittal.

1.5.3.5. Contractor shall send one (1) copy of the completed record submittal of the large format documents to a vendor (Ford Graphics is suggested) for scanning and posting on PCM (or other pre-approved program).

1.6. PRODUCT DATA

1.6.1. In addition to the above requirements, mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information unique to this Project.

1.6.2. After review, distribute in accordance with the above provisions and provide copies for Record Documents described in the Contract Documents.

1.7. SAMPLES

1.7.1. In addition to the above requirements, submit samples to illustrate functional and aesthetic characteristics of the Product in accordance with this Document, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.

1.7.2. Where specific colors or patterns are not indicated, provide materials and products specified in the full range of color, texture and pattern for selection by District. Range shall include standard stocked color/texture/pattern, standard color/texture/pattern not stocked, but available from manufacturer, and special color/ texture/pattern available from manufacturer as advertised in product data and brochures. Unless otherwise indicated in individual specification sections, District may select from any range at no additional cost to District.

1.7.3. Include identification on each sample, with full Project information.

1.7.4. Submit the number of samples that Contractor requires, plus one that will be retained by Architect and one by District.

1.7.5. Reviewed samples which may be used in the Work are indicated in individual specification Sections.

1.8. MANUFACTURERS' INSTRUCTIONS

1.8.1. When specified in individual specification Sections, submit manufacturers' printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, in quantities specified for Product Data.

1.8.2. Identify conflicts between manufacturers' instructions and Contract Documents.

1.9. MANUFACTURERS' CERTIFICATES

1.9.1. When specified in individual specification Sections, submit manufacturers' certificates to Architect for review, in quantities specified for Product Data.

1.9.2. Indicate material or Product conforms to or exceeds specified requirements. Submit supporting reference date, affidavits, and certifications as appropriate.

1.9.3. Certificates may be recent or previous test results on material or Product, but must be acceptable to District.

1.10. MOCK-UP

1.10.1. Where indicated, provide mock-ups as required. Mock-ups shall be prepared per the specifications and shall accurately and reasonably represent the quality of construction the Contractor will provide. If the mock-up or portions thereof do not adequately represent the quality of the work specified, the Contractor shall modify the mock-up as needed.

1.10.2. Once completed to the District's satisfaction, the mock-up shall serve as the standard of quality for the work.

1.10.3. All mock-ups, at District's option, shall remain the property of the District. If not required by the District, Contractor shall remove and dispose of the mock-up.

1.10.4. Where indicated, on-site mock-ups, if accepted, may be integrated into the Work.

1.11. DEFERRED APPROVAL REQUIREMENTS

1.11.1. Installation of deferred approval items shall not be started until detailed plans, specifications, and engineering calculations have been accepted and signed by the Architect or Engineer in general responsible charge of design and signed by a California registered Architect or professional engineer who has been delegated responsibility covering the work shown on a particular plan or specification and approved by the agency having authority (e.g., State Fire Marshall, Division of the State Architect, gas company, electrical utility company, water district, etc.). Deferred approval items for this Project are as indicated in the Summary of Work.

1.11.2. Unless otherwise indicated in the Contract Documents or if District provides written approval of a longer time period, Contractor shall submit all deferred approval items for approval within thirty (30) days of the notice to proceed with the Construction Phase.

1.11.3. Deferred approval drawings and specifications become part of the approved documents for the Project when they are submitted to and approved by the agency having authority.

1.11.4. Submit material using electronic submittal process as defined above.

1.11.5. Identify and specify all supports, fasteners, spacing, penetrations, etc., for each of the deferred approval items, including calculations for each and all fasteners.

1.11.6. Submit documents to Architect for review prior to forwarding to the agency having authority.

1.11.7. Documents shall bear the stamp and signature of the Structural, Mechanical, or Electrical Engineer licensed in the State of California who is responsible for the work shown on the documents.

1.11.8. Architect and its subconsultants will review the documents only for conformance with design concept shown on the documents. The Architect will then forward the Submittal to agency having authority for approval.

1.11.9. Contractor shall respond to review comments made by agency having authority and revise and resubmit submittal to the Architect for re-submittal to agency having authority for final approval.

END OF DOCUMENT

D0CUMENT 01 40 00

QUALITY REQUIREMENTS

1. GENERAL

1.1. RELATED DOCUMENTS AND PROVISIONS

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions;

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any);

1.1.4. Drawings;

1.1.5. Construction Schedule – Network Analysis;

1.1.6. General Definitions and References.

1.2. SUMMARY

1.2.1. This Document includes administrative and procedural requirements for quality assurance and quality control.

1.2.2. Testing and inspecting services by the District are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Documents' requirements.

1.2.2.1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Specifications for those activities. Requirements in those Specifications may also cover production of standard products.

1.2.2.2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Documents' requirements.

1.2.2.3. Requirements for Contractor to provide quality-assurance and -control services required by District, District's consultants, or authorities having jurisdiction are not limited by provisions of this Document.

1.3. DEFINITIONS

1.3.1. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

1.3.2. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by District or its consultants.

1.3.3. Mock-ups: Full-size, physical assemblies that are constructed on-site. Mock-ups are used to verify selections made under sample submittals, to demonstrate aesthetic effects and,

where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples. Approved mock-ups establish the standard by which the Work will be judged.

1.3.4. Laboratory Mock-ups: Full-size, physical assemblies that are constructed at testing facility to verify performance characteristics.

1.3.5. Preconstruction Testing: Tests and inspections that are performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.

1.3.6. Product Testing: Tests and inspections that are performed by an NRTL (National Recognized Testing Laboratory), an NVLAP (National Voluntary Laboratory Accreditation Program), or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with industry standards.

1.3.7. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.

1.3.8. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

1.4. CONFLICTING REQUIREMENTS

1.4.1. General: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different but apparently equal, to District for a decision before proceeding.

1.4.2. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to District for a decision before proceeding.

1.5. SUBMITTALS

1.5.1. Qualification Data: For testing agencies specified in "Quality Assurance" below to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

1.5.2. Schedule of Tests and Inspections: Prepare in tabular form and include the following:

1.5.2.1. Specification number and title.

1.5.2.2. Description of test and inspection.

1.5.2.3. Identification of applicable standards, codes or regulations.

1.5.2.4. Identification of test and inspection methods.

1.5.2.5. Number of tests and inspections required.

1.5.2.6. Time schedule or time span for tests and inspections.

1.5.2.7. Entity responsible for performing tests and inspections.

1.5.2.8. Requirements for obtaining samples.

1.5.2.9. Unique characteristics of each quality-control service.

1.5.3. Reports: Prepare and submit certified written reports that include the following:

1.5.3.1. Date of issue.

1.5.3.2. Project title and number.

1.5.3.3. Name, address, and telephone number of testing agency.

1.5.3.4. Dates and locations of samples and tests or inspections.

1.5.3.5. Names of individuals making tests and inspections.

1.5.3.6. Description of the Work and test and inspection method.

1.5.3.7. Identification of product and Specification.

1.5.3.8. Complete test or inspection data.

1.5.3.9. Test and inspection results and an interpretation of test results.

1.5.3.10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.

1.5.3.11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Documents' requirements.

1.5.3.12. Name and signature of laboratory inspector.

1.5.3.13. Recommendations on retesting and re-inspecting.

1.5.3.14. Descriptions of deficiencies noted, and corrective action undertaken to resolve such deficiencies.

1.5.3.14.1. Deficiencies observed shall immediately be brought to the attention of the Contractor's field superintendent, and trade foreman. In the event deficiencies are not corrected, or if an interpretation of the Contract Documents is required, the Testing Agency shall immediately notify the District and applicable consultant, Architect, or Engineer.

1.5.3.14.2. The Testing Agency shall maintain a deficiency list of all items not corrected and shall re-inspect the area after the deficiency has been corrected. The list shall include a description of the deficiency, the date and time the deficiency was observed, who was notified, the date of re-inspection and description of any corrective action taken. Distribute the deficiency list at least once per month.

1.5.3.15. 15. At the end of the Project, the Testing Agency shall submit a final signed report stating whether the work tested and inspected conforms to the Contract Documents' requirements.

1.5.4. Permits, Licenses, and Certificates: For District's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents established for compliance with standards and regulations bearing on performance of the Work.

1.6. QUALITY ASSURANCE

1.6.1. General: Qualifications paragraphs in this Article establish the minimum qualification levels required; individual Specifications specify additional requirements.

1.6.2. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance. Where required by the individual Specifications, Installer employing workers trained and approved by manufacturer, Installer being acceptable to manufacturer, and/or Installer being an authorized representative of manufacturer for both installation and maintenance.

1.6.3. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

1.6.4. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

1.6.5. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in the State of California, and who is experienced in providing engineering services of the kind indicated.

1.6.6. Engineering services are defined as those performed for installations of the system, assembly, or products that are similar to those indicated for this Project in material, design, and extent.

1.6.7. Specialists: Certain Specifications may require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.

1.6.7.1. Requirement for specialists shall not supersede building codes or regulations governing the Work.

1.6.8. Testing Agency Qualifications: An NRTL, an NVLAP, Division of the State of Architect's Accepted Laboratory, or an independent agency with the experience and capability to conduct testing and inspecting indicated; and with additional qualifications stated in individual Specifications; and where required by and acceptable to authorities having jurisdiction.

1.6.8.1. NRTL: A Nationally Recognized Testing Laboratory according to 29 CFR 1910.7.

1.6.8.2. NVLAP: A testing agency accredited according to NIST's (National Institute of Standards and Technology) National Voluntary Laboratory Accreditation Program.

1.6.8.3. Tests shall be made by an accredited testing agency with a minimum of 5 years of experience in the specific type of testing to be performed. Except as otherwise provided, sampling and testing of all materials and the laboratory methods and testing equipment shall be in accordance with the applicable standards and methods of the California Building Standards code.

1.6.8.4. For each type of inspection and testing service to be performed, the Testing Agency shall submit certification, signed and sealed by the Agency's professional engineer, of compliance with all applicable requirements of the following:

1.6.8.4.1. ASTM E329, "Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction."

1.6.8.4.2. "Recommended Requirements for Independent Laboratory Qualifications" published by the American Council of Independent Laboratories.

1.6.8.5. Furnish written certification to the District that all equipment to be used has been calibrated in accordance with applicable ASTM standards within the last year and is in proper working order.

1.6.8.6. Testing Agency Personnel Qualifications: Testing and inspection services shall be performed only by trained and experienced technicians currently qualified for the work they are to perform. Documentation of such training and experience shall be submitted to the District and/or its consultants upon request.

1.6.8.7. Each independent inspection and testing agency engaged on the Project shall be authorized by authorities having jurisdiction to operate in the state where the Project is located.

1.6.8.8. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

1.6.9. Preconstruction Testing: Where a testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:

1.6.9.1. Contractor responsibilities include the following:

1.6.9.1.1. Verify by its Quality Assurance/Quality Control procedures that an element is ready for testing prior to requesting a test.

1.6.9.1.2. Provide test specimens representative of proposed products and construction.

1.6.9.1.3. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.

1.6.9.1.4. Provide sizes and configurations of test assemblies, mock-ups, and laboratory mock-ups to adequately demonstrate capability of products to comply with performance requirements.

1.6.9.1.5. Build site-assembled test assemblies and mock-ups using installers who will perform same tasks for Project.

1.6.9.1.6. Build laboratory mock-ups at testing facility using personnel, products, and methods of construction indicated for the completed Work.

1.6.9.1.7. When testing is complete, remove test specimens, assemblies, mock-ups, and laboratory mock-ups; do not reuse products on Project.

1.6.9.2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to District with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected Work complies with or deviates from the Contract Documents' requirements.

1.6.10. Mock-ups: Before installing portions of the Work requiring mock-ups, build mock-ups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:

1.6.10.1. Build mock-ups in location and of size indicated or, if not indicated, as directed by District or its consultant.

1.6.10.2. Notify District and its consultants seven (7) days in advance of dates and times when mock-ups will be constructed.

1.6.10.3. Demonstrate the proposed range of aesthetic effects and workmanship.

1.6.10.4. Obtain District and its consultant's approval of mock-ups before starting work, fabrication, or construction.

1.6.10.4.1. Allow seven (7) days for initial review and each re-review of each mock-up.

1.6.10.5. Incorporate seismic design of nonstructural components as listed in Division 01 Document "Seismic Design Requirements for Non-Structural Components" into mock-ups.

1.6.10.6. Maintain mock-ups during construction in an undisturbed condition as a standard for judging the completed Work.

1.6.10.7. Demolish and remove mock-ups when directed, unless otherwise indicated.

1.6.11. Laboratory Mock-Ups: Comply with requirements of preconstruction testing and those specified in individual Specifications in Divisions 02 through 49.

1.7. QUALITY CONTROL

1.7.1. District Responsibilities: Where quality-control services are indicated as District's responsibility, District will engage a qualified testing agency to perform these services.

1.7.1.1. District will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting the testing agencies are engaged to perform.

1.7.1.2. Payment for these services will be made from testing and inspecting allowances, as authorized by Change Orders.

1.7.1.3. Costs for retesting and re-inspecting construction that replaces or is necessitated by Work that failed to comply with the Contract Documents will be charged to Contractor, and the Guaranteed Maximum Price will be adjusted by Change Order per the Contract Documents.

1.7.2. Tests and inspections not explicitly assigned to District are Contractor's responsibility. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.

1.7.2.1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform the quality-control services.

1.7.2.1.1. Contractor shall not employ same entity engaged by District, unless agreed to in writing by District.

1.7.2.2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.

1.7.2.3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.

1.7.2.4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.

1.7.2.5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

1.7.3. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Document "Submittal Procedures."

1.7.4. Re-testing/Re-inspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and re-inspecting, for construction that replaced Work that failed to comply with the Contract Documents' requirements.

1.7.5. Testing Agency Responsibilities: Cooperate with District, District's consultants, and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1.7.5.1. Notify District, District's consultants, and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.

1.7.5.2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.

1.7.5.3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.

1.7.5.4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.

1.7.5.5. Do not release, revoke, alter, or increase the Contract Documents' requirements or approve or accept any portion of the Work.

1.7.5.6. Do not perform any duties of Contractor.

1.7.6. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify testing agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1.7.6.1. Access to the Work.

1.7.6.2. Incidental labor and facilities necessary to facilitate tests and inspections.

1.7.6.3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.

1.7.6.4. Facilities for storage and field curing of test samples.

1.7.6.5. Delivery of samples to testing agencies.

1.7.6.6. Preliminary design mix proposed for use for material mixes that require control by testing agency.

1.7.6.7. Security and protection for samples and for testing and inspecting equipment at Project Site.

1.7.6.8. Furnish tools, samples of materials, design mixes, equipment and assistance as requested.

1.7.6.9. Provide and maintain, for the sole use of the Testing Agency, adequate facilities for the safe storage and proper curing of concrete test cylinders on the project site for the first 24 hours after casting as required by ASTM C31, Method of Making and Curing Concrete Test Specimens in the Field.

1.7.6.10. Build and store masonry test prisms in a manner acceptable to the Testing Agency. Prisms to be tested shall remain at the job site until moved by Testing Agency personnel.

1.7.6.11. Notify Testing Agency at least 10 working days in advance of any qualification testing for welding required herein.

1.7.6.12. Notify Testing Agency at least 24 hours prior to expected time for operations requiring testing or inspection services.

1.7.6.13. Make arrangements with the Testing Agency and pay for additional samples and tests made for the Contractor's convenience or for retesting of failed samples.

1.7.6.14. For deficiencies requiring corrective action, submit in writing a description of the deficiency and a proposed correction to the District. After review and approval, the proposed corrective action shall be implemented and inspected by the Testing Agency. It is Contractor's responsibility to ascertain that the deficiency is corrected and inspected prior to the work being covered.

1.7.6.15. Retention of an independent Testing Agency by the District shall in no way relieve Contractor of responsibility for performing all work in accordance with the Contract Documents' requirements.

1.7.7. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1.7.7.1. Schedule times for tests, inspections, obtaining samples, and similar activities.

1.8. TESTS AND SPECIAL INSPECTIONS

1.8.1. Special Tests and Inspections: Conducted by a qualified testing agency as required by authorities having jurisdiction, as indicated in individual Specifications, and as follows:

1.8.1.1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.

1.8.1.2. Notifying District, District's consultants, and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.

1.8.1.3. Submitting a certified written report of each test, inspection, and similar quality-control service to District, with copy to Contractor and to authorities having jurisdiction.

1.8.1.4. Submitting a final report of special tests and inspections at Project Completion, which includes a list of unresolved deficiencies.

1.8.1.5. Interpreting tests and inspections and stating in each report whether tested and inspected Work complies with or deviates from the Contract Documents.

1.8.1.6. Retesting and re-inspecting corrected work.

2. PRODUCTS

2.1. GENERAL

2.1.1. Do not use any materials or equipment represented by samples until tests, if required, have been made and the materials or equipment found to be acceptable. Any product which becomes unfit for use after acceptance shall not be incorporated into the Work.

3. EXECUTION

3.1. TEST AND INSPECTION LOG

3.1.1. Prepare a record of tests and inspections. Include the following:

3.1.1.1. Date test or inspection was conducted.

3.1.1.2. Description of the Work tested and inspected.

3.1.1.3. Date test or inspection results were transmitted to District.

3.1.1.4. Identification of testing agency or special inspector conducting test or inspection.

3.1.2. Maintain log at Project Site. Post changes and modifications as they occur. Provide access to test and inspection log for District's reference during normal working hours.

3.2. REPAIR AND PROTECTION

3.2.1. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

3.2.1.1. Provide materials and comply with installation requirements specified in other Specifications. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.

3.2.1.2. Comply with Document "Cutting and Patching" and all related Contract Documents' requirements.

3.2.2. Protect construction exposed by or for quality-control service activities.

3.2.3. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF DOCUMENT

DOCUMENT 01 42 13

ABBREVIATIONS AND ACRONYMS

1. GENERAL

1.1. RELATED DOCUMENTS AND PROVISIONS

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions including without limitation, Contract Terms and Definitions; and

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any).

1.2. ABBREVIATIONS AND ACRONYMS FOR STANDARDS AND REGULATIONS

1.2.1. Abbreviations and Acronyms for Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations as indicated in Thomson Gale™ (www.gale.com), Gale Research's "Encyclopedia of Associations" or "Encyclopedia of Associations: National Organizations of the U.S," or in Columbia Books' "National Trade & Professional Associations of the U.S."

1.2.2. Some of the applicable abbreviations and acronyms referenced in the Specifications or other Contract Documents have the following meanings, subject to updates or revisions based on the above-referenced publications:

- AA: Aluminum Association
- AAMA: Architectural Aluminum Manufacturers Association
- AASHTO: American Association of State Highway and TransportationOfficials
- ABPA: Acoustical and Board Products Association
- ACI: American Concrete Institute
- AGA: American Gas Association
- AGC: Associated General Contractor
- AHC: Architectural Hardware Consultant
- AI: Asphalt Institute
- AIA: American Institute of Architects
- AIEE: American Institute of Electrical Engineers
- AISC: American Institute of Steel Construction
- AISI: American Iron and Steel Institute
- AMCA: Air Moving and Conditioning Association
- ANSI: American National Standards Institute
- APA: American Plywood Association
- ARI: Air Conditioning and Refrigeration Institute
- ASHRAE: American Society of Heating, Refrigeration and Air Conditioning Engineers
- ASME: American Society of Mechanical Engineers
- ASSE: American Society of Structural Engineers
- ASTM: American Society of Testing and Materials
- AWPB: American Wood Preservers Bureau
- AWPI: American Wood Preservers Institute
- AWS: American Welding Society
- AWSC: American Welding Society Code
- AWI: Architectural Woodwork Institute
- AWWA: American Water Works Association
- BIA: Brick Institute of America
- CCR: California Code of Regulations
- CLFMI: Chain Link Fence Manufacturers Institute

- CMG: California Masonry Guild
- CRA: California Redwood Association
- CRSI: Concrete Reinforcing Steel Institute
- CS: Commercial Standards
- CSI: Construction Specifications Institute
- CTI: Cooling Tower Institute
- FGMA: Flat Glass Manufacturer's Association
- FIA: Factory Insurance Association
- FM: Factory Mutual
- FS: Federal Specification
- FTI: Facing Title Institute
- GA: Gypsum Association
- ICC: International Code Council
- IEEE: Institute of Electrical and Electronic Engineers
- IES: Illumination Engineering Society
- LIA: Lead Industries Association
- MIA: Marble Institute of America
- MLMA: Metal Lath Manufacturers Association
- MS: Military Specifications
- NAAMM: National Association of Architectural Metal Manufacturers
- NBHA: National Builders Hardware Association
- NBFU: National Board of Fire Underwriters
- NBS: National Bureau of Standards
- NCMA: National Concrete Masonry Association
- NEC: National Electrical Code
- NEMA: National Electrical Manufacturers Association
- NFPA: National Fire Protection Association/National Forest Product Association
- NMWIA: National Mineral Wool Insulation Association
- NTMA: National Terrazzo and Mosaic Association
- NWMA: National Woodwork Manufacturer's Association
- ORS: Office of Regulatory Services (California)
- OSHA: Occupational Safety and Health Act
- PCI: Precast Concrete Institute
- PCA: Portland Cement Association
- PDCA: Painting and Decorating Contractors of America
- PDI: Plumbing Drainage Institute
- PEI: Porcelain Enamel Institute
- PG&E: Pacific Gas & Electric Company
- PS: Product Standards
- SDI: Steel Door Institute; Steel Deck Institute
- SJI: Steel Joist Institute
- SSPC: Steel Structures Painting Council
- TCA: Tile Council of America
- TPI: Truss Plate Institute
- UBC: Uniform Building Code
- UL: Underwriters Laboratories Code
- UMC: Uniform Mechanical Code
- USDA: United States Department of Agriculture
- VI: Vermiculite Institute
- WCLA: West Coast Lumberman's Association
- WCLB: West Coast Lumber Bureau
- WEUSER: Western Electric Utilities Service Engineering Requirements
- WIC: Woodwork Institute of California
- WPOA: Western Plumbing Officials Association

1.2.3. Additional Abbreviations and Symbols: Refer to the above-referenced publications or to Drawings for additional abbreviations and for symbols.

END OF DOCUMENT

DOCUMENT 01 42 16

GENERAL DEFINITIONS AND REFERENCES

1. GENERAL

1.1. RELATED DOCUMENTS AND PROVISION

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions including without limitation, Contract Terms and Definitions;

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any); and

1.2. DEFINITIONS

General: Basic Contract definitions are included in the General Conditions of the Contract for Construction. The following are in addition to those definitions.

1.2.1. "Alternate": A cost or credit for certain Work that may be added to or deducted from the Project.

1.2.2. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

1.2.3. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

1.2.4. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

1.2.5. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

1.2.6. "Provide": Furnish and install, complete and ready for the intended use.

1.3. QUALITY ASSURANCE

1.3.1. For products or workmanship specified by association, trade, or Federal Standards, Contractor shall comply with requirements of the standard, except when more stringent requirements are specified in the Contract Documents, or are required by applicable codes.

1.3.2. Contractor shall conform to current reference standard publication in effect on the date of bid opening.

1.3.3. Unless directed otherwise by the Contract Documents, Contractor shall obtain copies of referenced standards.

1.3.4. Unless directed otherwise by the Contract Documents, Contractor shall maintain a copy of referenced standards at jobsite until Completion.

1.3.5. If specified standards conflict with Contract Documents, Contractor shall request clarification from the District or the Architect before proceeding.

1.3.6. Governing Codes shall be as shown in the Contract Documents including, without limitation, the Specifications.

1.4. STANDARDS

1.4.1. Standard Specifications: References to codes, specifications and standards referred to in the Contract Documents shall mean, and are intended to be, the latest edition, amendment or revision of such reference standard in effect as of the date of these Contract Documents. If those standard specifications are revised prior to Completion of any part of the Work to which such revision would pertain, Contractor may, if acceptable to and approved by the District, perform such Work in accordance with the revised standard specifications.

1.4.2. Conflicting Requirements: Where compliance with two or more standards is specified, and the standards may establish different or conflicting requirements for minimum quantities or quality levels, refer requirements that are different, but apparently equal, and uncertainties to the District for a decision before proceeding.

1.4.3. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of the requirements. Refer uncertainties to District for a decision before proceeding.

1.4.4. Copies of Standards: Each entity engaged in construction on the Project is required to be familiar with industry standards applicable to that entity's construction activity. Copies of applicable standards are not bound with the Contract Documents.

1.4.5. Copies from the Publication Source: Where copies of standards are needed for performance of a required construction activity, Contractor shall obtain copies directly from the publication source.

1.5. SCHEDULE OF REFERENCES

The following information is intended only for the general assistance of Contractor. District does not represent the accuracy of the information. Contractor shall independently verify the information for each entity listed below:

AA	Aluminum Association 900 19th Street NW, Suite 300 Washington, DC 20006 www.aluminum.org	202/862-5100
AABC	Associated Air Balance Council 1518 K Street, NW, Suite 503 Washington, DC 20005 www.aabchq.com	202/737-0202
AAMA	American Architectural Manufacturers Association 1827 Walden Office Sq., Suite 104 Schaumburg, IL 60173-4268 www.aamanet.org	847/303-5664
AASHTO	American Association of State Highway and	202/624-5800

	Transportation Officials 444 North Capitol Street, Suite 249 Washington, DC 20001 www.aashto.org	
AATCC	American Association of Textile Chemists and Colorists P.O. Box 12215 One Davis Drive Research Triangle Park, NC 27709-2215 www.aatcc.org	919/549-8141
ACI	American Concrete Institute P.O. Box 9094 Farmington Hills, MI 48333-9094 www.aci-int.org	248/848-3700
ACPA	American Concrete Pipe Association 222 West Las Colinas Blvd., Suite 641 Irving, TX 75039-5423 www.concrete-pipe.org	972/506-7216
ADC	Air Diffusion Council 11 South LaSalle St., Suite 1400 Chicago, IL 60603 http://www.flexibleduct.org/index.asp	312/201-0101
AFPA	American Forest and Paper Association 1111 19th St., NW, Suite 800 Washington, DC 20036 http://www.afandpa.org/	202/463-2700
AGA	American Gas Association 1515 Wilson Blvd. Arlington VA 22209 www.aga.com	703/841-8400
AHA	American Hardboard Association 1210 W. Northwest Hwy Palatine, IL 60067-1897 http://domensino.com/AHA/default.htm	847/934-8800
AI	Asphalt Institute Research Park Drive P.O. Box 14052 Lexington, KY 40512-4052 www.asphaltinstitute.org	606/288-4960
AIA	The American Institute of Architects 1735 New York Avenue, NW Washington, DC 20006-5292 www.aia.org	202/626-7300

AISC	American Institute of Steel Construction One East Wacker Drive, Suite 3100 Chicago, IL 60601-2001 http://www.aisc.org/	800/644-2400
AITC	American Institute of Timber Construction 7012 S. Revere Pkwy., Suite 140 Englewood, CO 80112 www.aitc-glulam.org	303/792-9559
ALCA	Associated Landscape Contractors of America 12200 Sunrise Valley Drive, Suite 150 Reston, VA 20191 www.alca.org	703/620-6363
ALI	Associated Laboratories, Inc. P.O. Box 152837 1323 Wall St. Dallas, TX 75315 http://www.assoc-labs.com/	214/565-0593
ALSC	American Lumber Standards Committee P.O. Box 210 Germantown, MD 20875	301/972-1700
AMCA	Air Movement and Control Association International, Inc. 30 W. University Drive Arlington Heights, IL 60004-1893 www.amca.org	847/394-0150
ANLA	American Nursery and Landscape Association 1250 Eye Street, NW, Suite 500 Washington, DC 20005	202/789-2900
ANSI	American National Standards Institute 11 West 42nd Street, 13th Floor New York, NY 10036-8002 www.ansi.org	212/642-4900
APA	APA-The Engineered Wood Association P.O. Box 11700 Tacoma, WA 98411-0700 www.apawood.org	206/565-6600
APA	Architectural Precast Association P.O. Box 08669 Fort Myers, FL 33908-0669	941/454-6989
ARI	Air Conditioning and Refrigeration Institute 4301 Fairfax Drive, Suite 425 Arlington, VA 22203 www.ari/org	703/524-8800
ARMA	Asphalt Roofing Manufacturers Association Center Park	301/231-9050

	4041 Powder Mill Road, Suite 404 Calverton, MD 20705	
ASA	Acoustical Society of America 500 Sunnyside Blvd. Woodbury, NY 11797	516/576-2360
ASCE	American Society of Civil Engineers- World Headquarters 1801 Alexander Bell Drive Reston, VA 20190-4400 www.asce.org	800/548-2723 703/295-6000
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers 1791 Tullie Circle, NE Atlanta, GA 30329-2305 www.ashrae.org	800/527-4723 404/636-8400
ASLA	American Society of Landscape Architects 4401 Connecticut Ave., NW, 5th Floor Washington, DC 20008-2369 www.asla.org	202/686-2752
ASME	American Society of Mechanical Engineers 345 East 47th Street New York, NY 10017-2392 www.asme.org	800/434-2763
ASPE	American Society of Plumbing Engineers 3617 Thousand Oaks Blvd., Suite 210 Westlake, CA 91362-3649	805/495-7120
ASQC	American Society for Quality Control 611 E. Wisconsin Avenue Milwaukee, WI 53201-3005 www.asqc.org	800/248-1946 414/272-8575
ASSE	American Society of Sanitary Engineering 28901 Clemens Road Westlake, OH 44145 www.asse-plumbing.org	216/835-3040
ASTM	American Society for Testing and Materials 100 Barr Harbor Drive West Conshohocken, PA 19428-2959 www.astm.org	610/832-9500
AWCI	Association of the Wall and Ceiling Industries--International 307 E. Annandale Road, Suite 200 Falls Church, VA 22042-2433 www.awci.org	703/534-8300
AWPA	American Wood-Preservers' Association 3246 Fall Creek Highway, Suite 1900 Granbury, TX 76049-7979	817/326-6300

AWS	American Welding Society 550 NW LeJeune Road Miami, FL 33126 www.amweld.org	800/443-9373 305/443-9353
AWWA	American Water Works Association 6666 West Quincy Avenue Denver, CO 80235 www.awwa.org	800/926-7337 303/794-7711
BHMA	Builders' Hardware Manufacturers Association 355 Lexington Avenue, 17th Floor New York, NY 10017-6603	212/661-4261
CBM	Certified Ballast Manufacturers Association 1422 Euclid Avenue, Suite 402 Cleveland, OH 44115-2094	216/241-0711
CGA	Compressed Gas Association 1725 Jefferson Davis Hwy, Suite 1004 Arlington, VA 22202-4102 www.cganet.com	703/412-0900
CISCA	Ceilings & Interior Systems Construction Association 1500 Lincoln Hwy, Suite 202 St. Charles, IL 60174 www.cisca.org	630/584-1919
CISPI	Cast Iron Soil Pipe Institute 5959 Shallowford Road, Suite 419 Chattanooga, TN 37421	423/892-0137
CPSC	Consumer Product Safety Commission East West Towers 4330 East-West Hwy. Bethesda, MD 20814	800/638-2772
CPPA	Corrugated Polyethylene Pipe Association 432 N. Superior Street Toledo, OH 43604	800/510-2772 419/241-2221
CRA	California Redwood Association 405 Enfrente Drive, Suite 200 Novato, CA 94949	415/382-0662
CRI	Carpet and Rug Institute 310 S. Holiday Avenue Dalton, GA 30722-2048 www.carpet-rug.com	800/882-8846 706/278-3176
CRSI	Concrete Reinforcing Steel Institute 933 N. Plum Grove Road Schaumburg, IL 60173-4758 www.crsi.org	847/517-1200

CTI	Ceramic Tile Institute of America 12061 W. Jefferson Blvd. Culver City, CA 90230-6219	310/574-7800
DHI	Door and Hardware Institute 14170 Newbrook Drive Chantilly, VA 20151-2223 www.dhi.org	703/222-2010
DIPRA	Ductile Iron Pipe Research Association 245 Riverchase Pkwy East, Suite O Birmingham, AL 35244	205/988-9870
DOC	Department of Commerce 14th Street and Constitution Avenue, NW Washington, DC 20230	202/482-2000
DOT	Department of Transportation 400 Seventh Street, SW Washington, DC 20590	202/366-4000
EJMA	Expansion Joint Manufacturers Association 25 N. Broadway Tarrytown, NY 10591-3201	914/332-0040
EPA	Environmental Protection Agency 401 M Street, SW Washington, DC 20460	202/260-2090
FCICA	Floor Covering Installation Contractors Association P.O. Box 948 Dalton, GA 30722-0948	706/226-5488
FM	Factory Mutual 1151 Boston-Providence Turnpike P.O. Box 9102 Norwood, MA 02062-9102 www.factorymutual.com	781/255-4300
FS	Federal Specifications Unit (Available from GSA) 470 East L'Enfant Plaza, SW, Suite 8100 Washington, DC 20407	202/619-8925
GA	Gypsum Association 810 First Street NE, Suite 510 Washington, DC 20002 www.usg.com	202/289-5440
GANA	Glass Association of North America 3310 SW Harrison Street Topeka, KS 66611-2279 www.glasswebsite.com/gana	913/266-7013

HMA	Hardwood Manufacturers Association 400 Penn Center Blvd., Suite 530 Pittsburgh, PA 15235-5605 www.hardwood.org	412/828-0770
HPVA	Hardwood Plywood and Veneer Association 1825 Michael Farraday Drive P.O. Box 2789 Reston, VA 22195-0789 www.hpva.org	703/435-2900
IEEE	Institute of Electrical and Electronic Engineers 345 E. 47th Street New York, NY 10017-2394 www.ieee.org	800/678-4333 212/705-7900
IESNA	Illuminating Engineering Society of North America 120 Wall Street, 17th Floor New York, NY 10005-4001 www.iesna.org	212/248-5000
ITS	Intertek Testing Services P.O. Box 2040 607/753-6711 3933 US Route 11 Cortland, NY 13045-7902 www.itsglobal.com	800/345-3851
LMA	Laminating Materials Association 116 Lawrence Street Hillsdale, NJ 07642-2730 www.lma.org	201/664-2700
MCAA	Mechanical Contractors Association of America 1385 Piccard Drive Rockville, MD 20850-4329	301/869-5800
ML/SFA	Metal Lath/Steel Framing Association (A Division of the NAAMM) 8 South Michigan Avenue, Suite 1000 Chicago, IL 60603	312/456-5590
MSS	Manufacturers Standardization Society for the Valve and Fittings Industry 127 Park Street, NE Vienna, VA 22180-4602	703/281-6613
NAA	National Arborist Association P.O. Box 1094 603/673-3311 Amherst, NH 03031-1094 www.natlarb.com	800/733-2622
NAAMM	National Association of Architectural Metal Manufacturers 8 South Michigan Avenue, Suite 1000 Chicago, IL 60603 www.gss.net/naamm	312/782-5590

NAIMA	North American Insulation Manufacturers Association 44 Canal Center Plaza, Suite 310 Alexandria, VA 22314 www.naima.org	703/684-0084
NAPA	National Asphalt Pavement Association NAPA Building 5100 Forbes Blvd. Lanham, MD 20706-4413	301/731-4748
NCSPA	National Corrugated Steel Pipe Association 1255 23rd Street, NW, Suite 850 Washington, DC 20037 www.ncspa.org	202/452-1700
NEBB	National Environmental Balancing Bureau 8575 Grovemont Circle Gaithersburg, MD 20877-4121	301/977-3698
NECA	National Electrical Contractors Association 3 Bethesda Metro Center, Suite 1100 Bethesda, MD 20814-5372	301/657-3110
NEI	National Elevator Industry 185 Bridge Plaza North, Suite 310 Fort Lee, NJ 07024	201/944-3211
NEMA	National Electrical Manufacturers' Association 1300 N. 17th Street, Suite 1847 Rosslyn, VA 22209 www.nema.org	703/841-3200
NFPA	National Fire Protection Association One Batterymarch Park P.O. Box 9101 Quincy, MA 02269-9101 www.nfpa.org	800/344-3555 617/770-3000
NHLA	National Hardwood Lumber Association P.O. Box 34518 Memphis, TN 38184-0518 www.natlhardwood.org	901/377-1818
NIA	National Insulation Association 99 Canal Center Plaza, Suite 222 Alexandria, VA 22314 www.insulation.org	703/683-6422
NPA	National Particleboard Association 18928 Premiere Court Gaithersburg, MD 20879-1569 www.pbmdf.com	301/670-0604
NPCA	National Paint and Coatings Association 1500 Rhode Island Avenue, NW Washington, DC 20005-5597 www.paint.org	202/462-6272

NRCA	National Roofing Contractors Association O'Hare International Center 10255 W. Higgins Road, Suite 600 Rosemont, IL 60018-5607 www.roofonline.org	800/323-9545
NRMCA	National Ready Mixed Concrete Association 900 Spring Street Silver Spring, MD 20910 www.nrmca.org	301/587-1400
NSF	NSF International P.O. Box 130140 Ann Arbor, MI 48113-0140 www.nsf.org	313/769-8010
NUSIG	National Uniform Seismic Installation Guidelines 12 Lahoma Court Alamo, CA 94526	510/946-0135
NWWDA	National Wood Window and Door Association 1400 E. Touhy Avenue, G-54 Des Plaines, IL 60018 www.nwwda.org	800/223-2301 847/299-5200
OSHA	Occupational Safety and Health Administration (U.S. Department of Labor) 200 Constitution Ave., NW Washington, DC 20210	202/219-8148
PCA	Portland Cement Association 5420 Old Orchard Road Skokie, IL 60077-1083 www.portcement.org	847/966-6200
PDCA	Painting and Decorating Contractors of America 3913 Old Lee Hwy, Suite 33-B Fairfax, VA 22030 www.pdca.com	800/332-7322 703/359-0826
PDI	Plumbing and Drainage Institute 45 Bristol Drive, Suite 101 South Easton, MA 02375	800/589-8956 508/230-3516
RFCI	Resilient Floor Covering Institute 966 Hungerford Drive, Suite 12-B Rockville, MD 20805-1714	301/340-8580
RIS	Redwood Inspection Service c/o California Redwood Association 405 Enfrente Drive, Suite 200 Novato, CA 94949-7206	415/382-0662
SDI	Steel Deck Institute P.O. Box 25 Fox River Grove, IL 60012 www.sdi.org	847/462-1930

SDI	Steel Door Institute 30200 Detroit Road Cleveland, OH 44145-1967	216/889-0010
SMA	Stucco Manufacturers Association 14006 Ventura Blvd. Sherman Oaks, CA 91403	213/789-8733
SMACNA	Sheet Metal and Air Conditioning Contractors National Association, Inc. P.O. Box 221230 Chantilly, VA 20151-1209 www.smacna.org	703/803-2980
SPI	Society of the Plastics Industry, Inc. Spray Polyurethane Division 1801 K Street, NW, Suite 600K Washington, DC 20006 www.socplas.org	800/951-2001 202/974-5200
SSPC	Steel Structures Painting Council 40 24th Street, 6th Floor Pittsburgh, PA 15222-4643	412/281-2331
TCA	Tile Council of America 100 Clemson Research Blvd. Anderson, SC 29625	864/646-8453
TPI	Turfgrass Producers International 1855-A Hicks Road Rolling Meadows, IL 60008	800/405-8873 847/705-9898
UL	Underwriters Laboratories, Inc. 333 Pfingston Road Northbrook, IL 60062 www.ul.com	800/704-4050 847/272-8800
UNI	Uni-Bell PVC Pipe Association 2655 Villa Creek Drive, Suite 155 Dallas, TX 75234 www.members.aol.com/unibell1	972/243-3902
USDA	U.S. Department of Agriculture 14th St. and Independence Ave., SW Washington, DC 20250	202/720-8732
WA	Wallcoverings Association 401 N. Michigan Avenue Chicago, IL 60611-4267	312/644-6610
WCLIB	West Coast Lumber Inspection Bureau P.O. Box 23145 Portland, OR 97281-3145	503/639-0651

WCMA	Window Covering Manufacturers Association 355 Lexington Ave., 17th Floor New York, NY 10017-6603	212/661-4261
WIC	Woodwork Institute of California P.O. Box 980247 West Sacramento, CA 95798-0247	916/372-9943
WLPDIA	Western Lath/Plaster/Drywall Industries Association 8635 Navajo Road San Diego, CA 92119	619/466-9070
WMMPA	Wood Moulding & Millwork Producers Association 507 First Street Woodland, CA 95695 www.wmmpa.com	800/550-7889 916/661-9591
WRI	Wire Reinforcement Institute 203 Loudoun Street, SW Leesburg, VA 20175-2718	703/779-2339
WWPA	Western Wood Products Association Yeon Building 522 S.W. 5th Avenue Portland, OR 97204-2122	503/224-3930

END OF DOCUMENT

DOCUMENT 01 45 29

TESTING LABORATORY SERVICES

1. GENERAL

1.1. RELATED DOCUMENTS AND PROVISION

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions, including “Tests and Inspections”; and

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any).

1.2. DOCUMENT INCLUDES

1.2.1. Observation and Supervision.

1.2.2. Testing Laboratories and Agencies

1.2.3. Tests and Inspections

1.2.4. Selection and Payment

1.2.5. District's Testing Laboratory Responsibilities

1.2.6. Laboratory reports.

1.2.7. Limits on testing laboratory authority.

1.2.8. Contractor responsibilities.

1.2.9. Schedule of inspections and tests.

1.2.10. Project Inspector’s Access to Site

1.3. REFERENCES

1.3.1. ASTM D3740 - Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

1.3.2. ASTM E329 - Recommended Practice for Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction.

1.3.3. CBC - California Building Code.

1.3.4. UBC - Uniform Building Code.

1.3.5. Title 24, Parts 1 and 2, of the California Code of Regulations. Contractor shall keep a copy of these available at the job Site for ready reference during construction

1.3.6. DSA - Division of the State Architect, Office of Regulation Services, Structural Safety Section. DSA shall be notified at or before the start of construction.

1.4. OBSERVATION AND SUPERVISION

1.4.1. The District and Architect or their appointed representatives will review the Work and the Contractor shall provide facilities and access to the Work at all times as required to facilitate this review. Administration by the Architect and any consulting Structural Engineer will be in accordance with applicable regulations, including, without limitation, 24 C.C.R. § 4-341.

1.4.2. One or more Project Inspector(s) approved by DSA and employed by or in contract with the District ("Project Inspector"), will observe the Work in accordance with 24 C.C.R. §§ 4-333(b) and 4-342:

1.4.3. Project Inspector shall have access to the Work wherever it is in preparation or progress for ascertaining that the Work is in accordance with the Contract Documents and all applicable code sections. Contractor shall provide facilities and access as required and shall provide assistance for sampling or measuring materials.

1.4.3.1. Project Inspector will notify District and Architect and inform Contractor of any observed failure of Work or material to conform to Contract Documents.

1.4.3.2. The Project Inspector shall observe and monitor all testing and inspection activities required.

1.4.4. Contractor shall conform with all applicable laws as indicated in the Contract Documents, including, without limitation, to 24 C.C.R. § 4-343. Contractor shall supervise and direct the Work and maintain a competent superintendent on the Project who is authorized to act in all matters pertaining to the Work. The Contractor shall inspect all materials, as they arrive, for compliance with the Contract Documents. Contractor shall reject defective Work or materials immediately upon delivery or failure of the Work or material to comply with the Contract Documents. The Contractor shall submit verified reports as indicated in the Contract Documents, including, without limitation, the Specifications and as required by 24 C.C.R. § 4-336.

1.5. TESTING LABORATORIES AND AGENCIES

1.5.1. Testing agencies and tests shall be in conformance with the Contract Documents and the requirements of 24 C.C.R. § 4-335.

1.5.2. Testing and inspection in connection with earthwork shall be under the direction of the District's consulting soils engineer ("Soils Engineer").

1.5.3. Testing and inspection of construction materials and workmanship shall be performed by a qualified laboratory ("Testing Laboratory" or "Laboratory"). The Testing Laboratory shall be under direction of an engineer registered in the State of California, shall conform to requirements of ASTM E329, and shall be employed by or in contract with the District.

1.6. TESTS AND INSPECTIONS

1.6.1. Contractor shall be responsible for notifying District and Project Inspector of all required tests and inspections. Contractor shall notify District and Project Inspector forty-eight (48) hours in advance of performing any Work requiring testing or inspection.

1.6.2. Contractor shall provide access to Work to be tested and furnish incidental labor, equipment, and facilities to facilitate all inspections and tests.

1.6.3. District will pay for first inspections and tests required by the Title 24 and other inspections or tests that District and/or Architect may direct to have made, including, but not limited to, the following principal items:

1.6.3.1. Tests and observations for earthwork and pavings.

1.6.3.2. Tests for concrete mix designs, including tests of trial batches.

1.6.3.3. Tests and inspections for structural steel work.

1.6.3.4. Field tests for framing lumber moisture content.

1.6.3.5. Additional tests directed by District that establish that materials and installation comply with the Contract Documents.

1.6.3.6. Test and observation of welding and expansion anchors.

1.6.3.7. Factory observation of components and assembly of modular prefabrication structures and buildings.

1.6.4. District may at its discretion, pay and back charge Contractor for:

1.6.4.1. Re-tests or re-inspections, if required, and tests or inspection required due to Contractor error or lack of required identifications of material.

1.6.4.2. Uncovering of work in accordance with Contract Documents.

1.6.4.3. Testing done on weekends, holidays, and overtime will be chargeable to Contractor for the overtime portion.

1.6.4.4. Testing done off site.

1.6.5. Testing and inspection reports and certifications:

1.6.5.1. If initially received by Contractor, Contractor shall provide to each of the following a copy of the agency or laboratory report of each test or inspection or certification: District; Construction Manager, if any; Architect; Consulting Engineer, if any; Other Engineers on the Project, as appropriate; and; Project Inspector.

1.6.5.2. When the test or inspection is one required by the Title 24, a copy of the report shall also be provided to the DSA.

1.7. SELECTION AND PAYMENT

1.7.1. District will hire and pay for services of an independent Testing Laboratory to perform specified inspection and testing as specified by District's Testing Laboratory.

1.7.2. District's hiring of Testing Laboratory shall in no way relieve Contractor of its obligation to perform work in accordance with requirements of Contract Documents.

1.8. DISTRICT'S TESTING LABORATORY RESPONSIBILITIES

1.8.1. Test samples of mixes submitted by Inspector.

1.8.2. Perform specified inspection, sampling, and testing of Products in accordance with specified standards.

1.8.3. Notify Architect and Contractor of observed irregularities or non-conformance of Work or Products.

1.8.4. Attend preconstruction conferences and progress meetings when requested by Architect.

1.9. LABORATORY REPORTS

1.9.1. After each inspection and test, District shall then submit one copy of laboratory report to Contractor. Reports of test results of materials and inspections found not to be in compliance with the requirements of the Contract Documents shall be forwarded immediately.

1.9.2. Each Testing Laboratory shall submit a verified report covering all of the tests which were required to be made by that agency during the progress of the Project. Such report shall be furnished each time that Work is suspended, covering the tests up to that time and at the Completion of the Project, covering all tests.

1.10. LIMITS ON TESTING LABORATORY AUTHORITY

1.10.1. Laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.

1.10.2. Laboratory may not approve or accept any portion of the Work.

1.10.3. Laboratory may not assume any duties of Contractor.

1.10.4. Laboratory has no authority to stop the Work.

1.11. CONTRACTOR RESPONSIBILITIES

1.11.1. Submit proposed items for testing as required herein and/or as further required in the Contract Documents to Architect for review in accordance with applicable specifications.

1.11.2. Cooperate with Laboratory personnel, and provide access to the Work and to manufacturer's facilities.

1.11.3. Notify Architect, District, and Testing Laboratory 48 hours prior to expected time for operations requiring inspection and testing services.

1.11.4. When tests or inspections cannot be performed after such notice, reimburse District for Laboratory personnel and travel expenses incurred due to the Contractor's negligence.

1.11.5. Contractor shall notify District a sufficient time in advance of the manufacture of material to be supplied by Contractor pursuant to the Contract Documents, which must by terms of the Contract be tested, in order that the District may arrange for the testing of same at the source of supply.

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

1.11.6. Contract and pay for services of District's Testing Laboratory to perform additional inspections, sampling and testing required when initial tests indicate Contractor's work and/or materials does not comply with Contract Documents.

1.12. SCHEDULE OF INSPECTIONS AND TESTS

The Testing Laboratory shall perform tests and inspections for the following in conformance with the (CBC) California Building Code (International Building Code with State of California Amendments), California Code of Regulations, Title 24, Part 2:

- Structural Tests and Special Inspections (Chapter 17A)
  - Special Inspections (§ 1704A)
- Soils and Foundations (Chapter 18A)
  - Geotechnical Investigations (§ 1803A)
- Concrete (Chapter 19A)
  - Specifications for Tests and Materials
  - Concrete Quality, Mixing and Placing
  - Concrete Reinforcement and Anchor Testing Inspection (§ 1916A)
- Masonry (Chapter 21A)
  - Masonry Construction Materials (§ 2103A)
  - Masonry Quality (§ 2103A)
  - Quality Assurance (§ 2105A)
- Structural Steel (Chapter 22A)
    - Structural Steel (§ 2205A)
    - Identification and Protection of Steel for Structural Purposes (§ 2203A)
  - Inspection and Tests of Structural Steel (§ 2212A)
- Wood (Chapter 23)
  - Minimum Standards and Quality (§ 2303)
  - Wood Construction (§ 1704A.6)
- Exterior Walls (Chapter 14)
    - Masonry Units (§ 1404.4)
    - Masonry Construction Materials (§ 2103A)
  - Exterior Insulation and Finish Systems (§ 1408)
- Roof Assemblies and Roofing Structures (Chapter 15)
  - Materials (§ 1506)
- Aluminum (Chapter 20)
  - Materials (§ 2002.1)
  - Inspection (§ 2003.1)

1.12.1. **Plumbing**

Testing as specified in Division 15 including, but not limited to: Sterilization, soil waste and vent, water piping, source of water, gas piping, downspouts and storm drains.

1.12.2. **Automatic Fire Sprinklers (where applicable)**

Testing as specified in Division 15 shall include, but not be limited to: hydrostatic pressure.

1.12.3. **Heating, Ventilating and Air Conditioning**

Testing as specified in Division 15 shall include, but not be limited to: Ductwork tests, cooling tower tests, boiler tests, controls testing, piping tests, water and air systems, and test and balance of heating and air conditioning systems.

1.12.4. **Electrical**

Testing as specified in Division 16, including, but not limited to: Equipment testing, all electrical system operations, grounding system and checking insulation after cable is pulled.

1.13. **PROJECT INSPECTOR'S ACCESS TO SITE**

1.13.1. A Project Inspector employed by the District in accordance with the requirement of State of California Code of Regulations, Title 24, Part 1 will be assigned to the Work. Project Inspector's duties are specifically defined in 24. C.C.R. §4-342, and as indicated in the General Conditions.

1.13.2. District and Construction Manager shall at all times have access for the purpose of inspection to all parts of the Work and to the shops wherein the Work is in preparation, and Contractor shall at all times maintain proper facilities and provide safe access for such inspection.

1.13.3. The Work in all stages of progress shall be subject to the personal continuous observation of the Inspector. Inspector shall have free access to any or all parts of the Work at any time. Contractor shall furnish the Inspector reasonable facilities for obtaining such information as may be necessary to keep Inspector fully informed respecting the progress and manner of the Work and the character of the materials. Inspection of the Work shall not relieve the Contractor from any obligation set forth in the Contract Documents.

1.13.4. The Inspector is not authorized to change, revoke, alter, enlarge or decrease in any way any requirement of the Contract Documents, drawings, specifications or subsequent change orders.

1.13.5. Whenever there is insufficient evidence of compliance with any of the provisions of Title 24 or evidence that any material or construction does not conform to the requirements of Title 24, the Division of the State Architect may require tests as proof of compliance. Test methods shall be as specified herein or by other recognized and accepted test methods determined by the Division of the State Architect. All tests shall be performed by a testing laboratory accepted by the Division of the State Architect.

END OF DOCUMENT

DOCUMENT 01 50 00
TEMPORARY FACILITIES AND CONTROLS

1. GENERAL

1.1. RELATED DOCUMENTS AND PROVISIONS

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions;

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any);

1.1.4. Site Standards; and

1.1.5. Temporary Tree and Plant Protection.

1.2. TEMPORARY UTILITIES

1.2.1. **Electric Power and Lighting**:

1.2.1.1. Contractor will furnish and pay for power during the course of the work to the extent power is not in the building(s) or on the Site. Contractor shall be responsible for providing temporary facilities required on the Site to point of intended use.

1.2.1.2. Contractor shall furnish, wire for, install, and maintain temporary electrical lights wherever it is necessary to provide illumination for the proper performance and/or observation of the Work: a minimum of 20 foot-candles for rough work and 50 foot-candles for finish work.

1.2.1.3. Contractor shall be responsible for maintaining existing lighting levels in the Project vicinity should temporary outages or service interruptions occur.

1.2.2. **Heat and Ventilation**:

1.2.2.1. Contractor shall provide temporary heat to maintain environmental conditions to facilitate progress of the Work, to meet specified minimum conditions for the installation and curing of materials, and to protect materials and finishes from damage due to improper temperature and humidity conditions. Portable heaters shall be standard units complete with controls.

1.2.2.2. Contractor shall provide forced ventilation and dehumidification, as required, of enclosed areas for proper installation and curing of materials, to disperse humidity, and to prevent hazardous accumulations of dust, fumes, vapors, and gases.

1.2.2.3. Contractor shall pay the costs of installation, maintenance, operation, and removal of temporary heat and ventilation, including costs for fuel consumed, required for the performance of the Work.

1.2.3. **Water**:

1.2.3.1. Contractor will furnish and pay for water during the course of the work. Contractor shall be responsible for providing temporary facilities required.

1.2.3.2. Contractor shall make potable water available for human consumption.

1.2.4. **Sanitary Facilities**:

1.2.4.1. Contractor shall provide sanitary temporary facilities in no fewer numbers than required by law and such additional facilities as may be directed by the Inspector for the use of all workers. The facilities shall be maintained in a sanitary condition at all times and shall be left at the Site until removal is directed by the District or Contractor completes all Work.

1.2.4.2. Use of toilet facilities in the Site shall not be permitted except by consent of the Project Inspector and District.

1.2.5. **Fire Protection:**

1.2.5.1. Contractor shall provide and maintain fire extinguishers and other equipment for fire protection. Such equipment shall be designated for use for fire protection only and shall comply with all requirements of the California Fire, State Fire Marshall and/or its designee.

1.2.5.2. Where on-site welding and burning of steel is unavoidable, Contractor shall provide protection for adjacent surfaces.

1.2.6. **Trash Removal:**

1.2.6.1. Contractor shall provide trash removal on a timely basis from all Site Offices and throughout the Site.

1.2.7. **Temporary Facilities:**

1.2.7.1. Contractor shall provide sufficient space and facilities for its own force's needs.

1.3. CONSTRUCTION AIDS

1.3.1. **Plant and Equipment:**

1.3.1.1. Contractor shall furnish, operate, and maintain a complete plant for fabricating, handling, conveying, installing, and erecting materials and equipment; and for conveyances for transporting workmen. Include elevators, hoists, debris chutes, and other equipment, tools, and appliances necessary for performance of the Work.

1.3.1.2. Contractor shall maintain plant and equipment in safe and efficient operating condition. Damages due to defective plant and equipment, and uses made thereof, shall be repaired by Contractor at no expense to the District.

1.3.2. No District tools or equipment shall be used by Contractor or its subcontractors for the performance of the Work.

1.4. BARRIERS AND ENCLOSURES

1.4.1. Contractor shall obtain District's written permission for locations and types of temporary barriers and enclosures, including fire-rated materials proposed for use, prior to their installation.

1.4.2. Contractor shall provide a six (6) foot high, chain link perimeter fence with posts driven into the ground and fabric screen as a temporary barrier around construction area. Contractor shall provide and maintain temporary enclosures to prevent public entry and to protect persons using other buildings and portions of the Site and/or Premises. Contractor shall remove temporary fence, barriers and enclosure upon Completion of the Work.

1.4.3. Contractor shall provide site access to existing facilities for persons using other buildings and portions of the Site, for the public, and for deliveries and other services and activities.

1.5. SECURITY

Contractor shall secure all construction equipment, machinery and vehicles, park and store only within fenced area, and render inoperable during non-work hours. Contractor is responsible for ensuring that no construction materials, tools, equipment, machinery or vehicles can be used for unauthorized entry or other damage or interference to activities and security of existing facilities adjacent to and in the vicinity of the Project Site.

1.6. TEMPORARY CONTROLS

1.6.1. **Noise Control**:

1.6.1.1. Contractor acknowledges that adjacent facilities may remain in operation during all or a portion of the Work, and Contractor shall take all reasonable precautions to minimize noise as required by applicable laws and the Contract Documents.

1.6.1.2. Notice of proposed noisy operations, including without limitation, operation of pneumatic demolition tools, concrete saws, and other equipment, shall be submitted to District a minimum of forty-eight (48) hours in advance of their performance.

1.6.2. **Noise and Vibration**:

1.6.2.1. Equipment and impact tools shall have intake and exhaust mufflers.

1.6.2.2. Contractor shall cooperate with District to minimize and/or cease the use of noisy and vibratory equipment if that equipment becomes objectionable by its longevity.

1.6.3. **Dust and Dirt**:

1.6.3.1. Contractor shall conduct demolition and construction operations to minimize the generation of dust and dirt, and prevent dust and dirt from interfering with the progress of the Work and from accumulating in the Work and adjacent areas including, without limitation, occupied facilities.

1.6.3.2. Contractor shall periodically water exterior demolition and construction areas to minimize the generation of dust and dirt.

1.6.3.3. Contractor shall ensure that all hauling equipment and trucks carrying loads of soil and debris shall have their loads sprayed with water or covered with tarpaulins, and as otherwise required by local and state ordinance.

1.6.3.4. Contractor shall prevent dust and dirt from accumulating on walks, roadways, parking areas, and planting, and from washing into sewer and storm drain lines.

1.6.4. **Surface and Subsurface Water:**

Contractor shall not permit surface and subsurface water, and other liquids, to accumulate in or about the vicinity of the Premises. Should accumulation develop, Contractor shall control the water or other liquid, and suitably dispose of it by means of temporary pumps, piping, drainage lines, troughs, ditches, dams, or other methods.

1.6.5. **Pollution**:

1.6.5.1. No burning of refuse, debris, or other materials shall be permitted on or in the vicinity of the Premises.

1.6.5.2. Contractor shall comply with applicable regulatory requirements and anti-pollution ordinances during the conduct of the Work including, without limitation, demolition, construction, and disposal operations.

1.6.6. **Lighting**

If portable lights are used after dark, all light must be located so as not to direct light into neighboring property.

1.7. JOB SIGN(S)

Signs other than the specified Project sign and or signs required by law, for safety, or for egress, shall not be permitted, unless otherwise approved in advance by the District.

1.8. PUBLICITY RELEASES

Contractor shall not release any information, story, photograph, plan, or drawing relating to information about the Project to anyone, including press and other public communications medium, including, without limitation, on website(s).

END OF DOCUMENT

DOCUMENT 01 52 10

SITE STANDARDS

1. GENERAL

1.1. RELATED DOCUMENTS AND PROVISIONS:

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions, including without limitation, Site Access, Conditions, and Regulations;

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any);

1.1.4. Drug-Free Workplace Certification;

1.1.5. Tobacco-Free Environment Certification;

1.1.6. Criminal Background Investigation/Fingerprinting Certification; and

1.1.7. Temporary Facilities and Controls.

1.2. REQUIREMENTS OF THE DISTRICT

1.2.1. **Drug-Free Schools and Safety Requirements:**

1.2.1.1. All school sites and other District Facilities have been declared “Drug-Free Zones.” No drugs, alcohol, smoking or the use of tobacco products are allowed at any time in any buildings, Contractor-owned vehicles or vehicles owned by others while on District property. No students, staff, visitors, or contractors are to use drugs on these sites.

1.2.1.2. Contractor shall post: "Non-Smoking Area" in a highly visible location on Site. Contractor may designate a smoking area outside of District property within the public right-of-way, provided that this area remains quiet and unobtrusive to adjacent neighbors. This smoking area must be kept clean at all times.

1.2.1.3. Contractor shall ensure that no alcohol, firearms, weapons, or controlled substances enter or are used at the Site. Contractor shall immediately remove from the Site and terminate the employment of any employee(s) found in violation of this provision.

1.2.2. **Language**: Unacceptable and/or loud language will not be tolerated, "Cat calls" or other derogatory language toward students or public will not be allowed.

1.2.3. **Disturbing the Peace (Noise and Lighting):**

1.2.3.1. Contractor shall observe the noise ordinance of the Site at all times including, without limitation, all applicable local, city, and/or state laws, ordinances, and/or regulations regarding noise and allowable noise levels.

1.2.3.2. The use of radios, etc., shall be controlled to keep all sound at a level that cannot be heard beyond the immediate area of use. District reserves the right to prohibit the use of radios at the Site, except for handheld communication radios.

1.2.3.3. If portable lights are used after dark, the lights must be located so as not to direct light into neighboring properties.

1.2.4. **Traffic**:

1.2.4.1. Driving on the Premises shall be limited to periods when students and public are not present. If driving or deliveries must be made during the school hours, two (2) or more ground guides shall lead the vehicle across the area of travel. In no case shall driving take place across playgrounds or other pedestrian paths during recess, lunch, and/or class period changes. The speed limit on-the Premises shall be five (5) miles per hour (maximum) or less if conditions require.

1.2.4.2. All paths of travel for deliveries, including without limitation, material, equipment, and supply deliveries, shall be reviewed and approved by District in advance. Any damage will be repaired to the pre-damaged condition by the Contractor.

1.2.4.3. District shall designate a construction entry to the Site. If Contractor requests, District determines it is required, and to the extent possible, District shall designate a staging area so as not to interfere with the normal functioning of school facilities. Location of gates and fencing shall be approved in advance with District and at Contractor's expense.

1.2.4.4. Parking areas shall be reviewed and approved by District in advance. No parking is to occur under the drip line of trees or in areas that could otherwise be damaged.

1.2.4.5. All of the above shall be observed and complied with by the Contractor and all workers on the Site. Failure to follow these directives could result in individual(s) being suspended or removed from the work force at the discretion of the District. The same rules and regulations shall apply equally to delivery personnel, inspectors, consultants, and other visitors to the Site.

END OF DOCUMENT

DOCUMENT 01 56 39

TEMPORARY TREE AND PLANT PROTECTION

WHERE SUBSTANTIAL TREE PROTECTION WILL BE REQUIRED ON THE SITE, OBTAIN AN ARBORIST TO REVIEW THIS DOCUMENT PRIOR TO BIDDING.

1. GENERAL

1.1. RELATED DOCUMENTS

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions;

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any); and

1.1.4. Temporary Facilities and Controls.

1.2. SUMMARY

This Document includes the protection and trimming of existing trees that interfere with, or are affected by, execution of the Work, whether temporary or permanent construction.

1.3. DEFINITIONS

Tree Protection Zone: Area surrounding individual trees or groups of trees to remain during construction, and defined by the drip line of individual trees or the perimeter drip line of groups of trees, unless otherwise indicated.

1.4. SUBMITTALS

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

1.4.2. Tree Pruning Schedule: Written schedule from arborist detailing scope and extent of pruning of trees to remain that interfere with or are affected by construction.

1.4.3. Qualification Data: For tree service firm and arborist.

1.4.4. Certification: From arborist, certifying that trees indicated to remain have been protected during construction according to recognized standards and that trees were promptly and properly treated and repaired when damaged.

1.4.5. Maintenance Recommendations: From arborist, for care and protection of trees affected by construction during and after completing the Work.

1.5. QUALITY ASSURANCE

1.5.1. Tree Service Firm Qualifications: An experienced tree service firm that has successfully completed tree protection and trimming work similar to that required for this Project and that will assign an experienced, qualified arborist to Project site during execution of tree protection and trimming.

1.5.2. Arborist Qualifications: An arborist certified by ISA (International Society of Arboriculture) or licensed in the jurisdiction where Project is located.

1.5.3. Tree Pruning Standard: Comply with ANSI A300 (Part 1), "Tree, Shrub, and Other Woody Plant Maintenance--Standard Practices (Pruning)."

1.5.3.1. Before tree protection and trimming operations begin, meet with District to review tree protection and trimming procedures and responsibilities.

2. PRODUCTS

2.1. MATERIALS

2.1.1. Unless otherwise specified, Contractor shall select materials as recommended by arborist or landscape architect.

2.1.2. Drainage Fill: Selected crushed stone, or crushed or uncrushed gravel, washed, ASTM D 448, Size 24, with 90 to 100 percent passing a 2-1/2-inch (63-mm) sieve and not more than 10 percent passing a 3/4-inch (19-mm) sieve.

2.1.3. Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 1 inch (25 mm) in diameter; and free of weeds, roots, and toxic and other non-soil materials.

2.1.3.1. Obtain topsoil only from well-drained sites where topsoil is 4 inches (100 mm) deep or more; do not obtain from bogs or marshes.

2.1.4. Filter Fabric: Manufacturer's standard, nonwoven, pervious, geotextile fabric of polypropylene, nylon, or polyester fibers.

2.1.5. Chain-Link Fence: Metallic-coated steel chain-link fence fabric of 0.120-inch- (3-mm-) diameter wire; a minimum of 48 inches (1200 mm) high; with 1.9-inch- (48-mm-) diameter line posts; 2-3/8-inch- (60-mm-) diameter terminal and corner posts; 1-5/8-inch- (41-mm-) diameter top rail; and 0.177-inch- (4.5-mm-) diameter bottom tension wire; with tie wires, hog ring ties, and other accessories for a complete fence system.

2.1.6. Select mulch as recommended by arborist or landscape architect.

2.1.7. Organic Mulch: Use shredded hardwood, ground or shredded bark, or wood and bark chips, all free of deleterious materials.

3. EXECUTION

3.1. PREPARATION

3.1.1. Temporary Fencing: Install temporary fencing around tree protection zones to protect remaining trees and vegetation from construction damage. Maintain temporary fence and remove when construction is complete.

3.1.2. Install chain-link fence according to ASTM F 567 and manufacturer's written instructions.

3.1.3. Protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials. Protect root systems from ponding, eroding, or excessive wetting caused by dewatering operations.

3.1.4. Mulch areas inside tree protection zones and other areas indicated.

3.1.4.1. Select mulch as recommended by arborist or landscape architect.

3.1.4.2. Apply 2-inch (50-mm) to 3-inch (75-mm) average thickness of organic mulch. Do not place mulch within 6 inches (150 mm)] of tree trunks.

3.1.5. Do not store construction materials, debris, or excavated material inside tree protection zones. Do not permit vehicles or foot traffic within tree protection zones; prevent soil compaction over root systems.

3.1.6. Maintain tree protection zones free of weeds and trash.

3.1.7. Do not allow fires within tree protection zones.

3.2. EXCAVATION

3.2.1. Install shoring or other protective support systems to minimize sloping or benching of excavations where construction or utility excavation is near trees to be protected.

3.2.2. Do not excavate within tree protection zones, unless otherwise indicated.

3.2.3. Where excavation for new construction is required within tree protection zones, hand clear and excavate to minimize damage to root systems. Use narrow-tine spading forks and comb soil to expose roots.

3.2.3.1. Do not allow exposed roots to dry out before placing permanent backfill. Provide temporary earth cover or pack with peat moss and wrap with burlap. Water and maintain in a moist condition. Temporarily support and protect roots from damage until they are permanently relocated and covered with soil.

3.2.4. Where utility trenches are required within tree protection zones, tunnel under or around roots by drilling, auger boring, pipe jacking, or digging by hand.

3.2.4.1. Root Pruning: Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities. Cut roots with sharp pruning instruments; do not break or chop.

3.3. REGRADING

3.3.1. Grade Lowering: Where new finish grade is indicated below existing grade around trees, slope grade beyond tree protection zones. Maintain existing grades within tree protection zones.

3.3.2. Grade Lowering: Where new finish grade is indicated below existing grade around trees, slope grade away from trees as recommended by arborist, unless otherwise indicated.

3.3.2.1. Root Pruning: Prune tree roots exposed during grade lowering. Do not cut main lateral roots or taproots; cut only smaller roots. Cut roots with sharp pruning instruments; do not break or chop.

3.3.3. Minor Fill: Where existing grade is 6 inches (150 mm) or less below elevation of finish grade, fill with topsoil. Place topsoil in a single uncompacted layer and hand grade to required finish elevations.

3.3.4. Moderate Fill: Where existing grade is more than 6 inches (150 mm) but less than 12 inches (300 mm) below elevation of finish grade, place drainage fill, filter fabric, and topsoil on existing grade as follows:

3.3.4.1. Carefully place drainage fill against tree trunk approximately 2 inches (50 mm) above elevation of finish grade and extend not less than 18 inches (450 mm) from tree trunk on all sides. For balance of area within drip-line perimeter, place drainage fill up to 6 inches (150 mm) below elevation of grade.

3.3.4.2. Place filter fabric with edges overlapping 6 inches (150 mm) minimum.

3.3.4.3. Place fill layer of topsoil to finish grade. Do not compact drainage fill or topsoil. Hand grade to required finish elevations.

3.4. TREE PRUNING

3.4.1. Prune trees to remain that are affected by temporary and permanent construction.

3.4.2. Prune trees to remain to compensate for root loss caused by damaging or cutting root system. Provide subsequent maintenance during Contract period as recommended by arborist.

3.4.3. Pruning Standards: Prune trees according to ANSI A300 (Part 1), as recommended by arborist report.

3.4.4. Adjust pruning requirements per arborist's recommendations.

3.4.5. Cut branches with sharp pruning instruments; do not break or chop.

3.4.6. Modify below to specific project requirements.

3.4.7. Chip removed tree branches and dispose of or spread over areas identified by District.

3.5. TREE REPAIR AND REPLACEMENT

3.5.1. Promptly repair trees damaged by construction operations within 24 hours. Treat damaged trunks, limbs, and roots according to arborist's written instructions.

3.5.2. Remove and replace trees indicated to remain that die or are damaged during construction operations or that are incapable of restoring to normal growth pattern.

3.5.2.1. Provide new trees of 6-inch (150-mm) caliper size and of a when damaged trees more than 6 inches (150 mm) in caliper size, measured 12 inches (300 mm) above grade, are required to be replaced. Plant and maintain new trees as specified in Contract Documents.

3.5.3. Where recommended by arborist report, aerate surface soil, compacted during construction, 10 feet (3 m) beyond drip line and no closer than 36 inches (900 mm) to tree trunk. Drill 2-inch (50-mm) diameter holes a minimum of 12 inches (300 mm) deep at 24 inches (600 mm) o.c. Backfill holes with an equal mix of augered soil and sand.

3.6. DISPOSAL OF WASTE MATERIALS

3.6.1. Burning is not permitted.

3.6.2. Disposal: Remove excess excavated material and displaced trees from Site.

END OF DOCUMENT

DOCUMENT 01 60 00

MATERIALS AND EQUIPMENT

1. GENERAL

1.1. RELATED DOCUMENTS AND PROVISIONS

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions.

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any); and

1.1.4. Imported Materials Certification.

1.2. MATERIALS AND EQUIPMENT

1.2.1. Only items approved by the District and/or Architect shall be used.

1.2.2. Contractor shall submit lists of Products and other Product information in accordance with the Contract Documents, including, without limitation, the provisions regarding the submittals.

1.3. MATERIALS AND EQUIPMENT COLORS

1.3.1. The Contractor shall comply with all schedule(s) of colors provided by the District and/or Architect.

1.3.2. No individual color selections will be made until after approval of all pertinent materials and equipment and after receipt of appropriate samples in accordance with the Contract Documents, including, without limitation, the provisions regarding the submittals.

1.3.3. Contractor shall request priority in writing for any item requiring advance ordering to maintain the approved Construction Schedule.

1.4. DELIVERY, STORAGE, AND HANDLING

1.4.1. Contractor shall deliver manufactured materials in original packages, containers, or bundles (with seals unbroken), bearing name or identification mark of manufacturer. District may inspect materials prior to Contractor unloading the delivered materials. District may reject any materials that do not conform to the Contract Documents.

1.4.2. Contractor shall deliver fabrications in as large assemblies as practicable; where specified as shop-primed or shop-finished, package or crate as required to preserve such priming or finish intact and free from abrasion.

1.4.3. Contractor shall store materials in such a manner as necessary to properly protect them from damage. Materials or equipment damaged by handling, weather, dirt, or from any other cause will not be accepted.

1.4.4. Materials that have been warehoused for long periods of time, stored or transported in improper environment, improperly packaged, inadequately labeled, poorly protected, excessively shipped, deviated from normal distribution pattern, or reassembled are not acceptable.

1.4.5. Contractor shall store materials so as to cause no obstructions of sidewalks, roadways, or underground services. Contractor shall protect materials and equipment furnished pursuant to the Contract Documents.

1.4.6. Contractor may store materials on Site with prior written approval by District; all materials shall remain under Contractor's control and Contractor shall remain liable for any damage to the materials. Should the Project Site not have storage area available, the Contractor shall provide for off-site storage at no cost to District.

1.4.7. When any room in Project is used as a shop or storeroom, Contractor shall be responsible for any repairs, patching, or cleaning necessary due to that use. Location of storage space shall be subject to prior written approval by District.

2. PRODUCTS

2.1. MANUFACTURERS

2.1.1. Manufacturers listed in various sections of the Contract Documents are names of those manufacturers that are believed to be capable of supplying one or more of the items specified therein.

2.1.2. The listing of a manufacturer does not imply that every product of that manufacturer is acceptable or as meeting the requirements of the Contract Documents.

2.2. FACILITIES AND EQUIPMENT

Contractor shall provide, install, maintain, and operate a complete and adequate facility for handling, execution, disposal, and distribution of materials and equipment as required for proper and timely performance of Work.

2.3. MATERIALS REFERENCE STANDARDS

Where materials are specified solely by reference to “standard specifications” or other general reference, and if requested by District, Contractor shall submit for review data on actual materials proposed to be incorporated into Work, listing name and address of vendor, manufacturer, or producer, and trade or brand names of those materials, and data substantiating compliance with standard specifications.

3. EXECUTION

3.1. WORKMANSHIP

3.1.1. Where not more specifically described in any other Contract Documents, workmanship shall conform to methods and operations of best standards and accepted practices of trade or trades involved and shall include items of fabrication, construction, or installation regularly furnished or required for completion (including finish and for successful operation, as intended).

3.1.2. Work shall be executed by tradespersons skilled in their respective field of work. When completed, parts shall have been durably and substantially built and present a neat appearance.

3.2. COORDINATION

3.2.1. Contractor shall coordinate installation of materials and equipment so as to not interfere with installation of other Work. Adjustment or rework because of Contractor's failure to coordinate will be at no additional cost to District.

3.2.2. Contractor shall examine in-place materials and equipment for readiness, completeness, fitness to be concealed or to receive Work, and compliance with Contract Documents. Concealing or covering work constitutes acceptance of additional cost which will result should in-place materials and equipment be found unsuitable for receiving other work or otherwise deviating from the requirements of the Contract Documents.

3.3. COMPLETENESS

Contractor shall provide all portions of the Work, unless clearly stated otherwise, installed complete and operational with all elements, accessories, anchorages, utility connections, etc., in a manner to ensure well-balanced performance, in accordance with manufacturer's recommendations and in accordance with Contract Documents. For example, electric water coolers require water, electricity, and drain services; roof drains require drain systems; sinks fit within countertop, etc. Terms such as "installed complete," "operable condition," "for use intended," "connected to all utilities," "terminate with proper cap," "adequately anchored," "patch and refinish," and "to match similar" should be assumed to apply in all cases, except where completeness of functional or operable condition is specifically stated as not required.

3.4. APPROVED INSTALLER OR APPLICATOR

Contractor shall ensure that all installations are only performed by a manufacturer's approved installer or applicator.

3.5. MANUFACTURER'S RECOMMENDATIONS

All installations shall be in accordance with manufacturer's published recommendations and specific written directions of manufacturer's representative. Should the Contract Documents differ from recommendations of manufacturer or directions of manufacturer's representative, Contractor shall analyze differences, make recommendations to the District and the Architect in writing, and shall not proceed until interpretation or clarification has been issued by the District and/or the Architect.

END OF DOCUMENT

DOCUMENT 01 66 10

DELIVERY, STORAGE AND HANDLING

1. GENERAL

1.1. RELATED DOCUMENTS AND PROVISIONS

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions, including, without limitation, Site Access, Conditions and Requirements; and

1.1.2. Special Conditions.

1.2. PRODUCTS

1.2.1. Products are as defined in the General Conditions.

1.2.2. Contractor shall not use and/or reuse materials and/or equipment removed from existing Premises, except as specifically permitted by the Contract Documents.

1.2.3. Contractor shall provide interchangeable components of the same manufacturer, for similar components.

1.3. TRANSPORTATION AND HANDLING

1.3.1. Contractor shall transport and handle Products in accordance with manufacturer's instructions.

1.3.2. Contractor shall promptly inspect shipments to confirm that Products comply with Contract requirements, are of correct quantity, and are undamaged.

1.3.3. Contractor shall provide equipment and personnel to properly handle Products to prevent soiling, disfigurement, or damage.

1.4. STORAGE AND PROTECTION

1.4.1. Contractor shall store and protect Products in accordance with manufacturer's instructions, with seals and labels intact and legible. Contractor shall store sensitive Products in weather-tight, climate controlled enclosures.

1.4.2. Contractor shall place fabricated Products that are stored outside, on above-ground sloped supports.

1.4.3. Contractor shall provide off-site storage and protection for Products when Site does not permit on-site storage or protection.

1.4.4. Contractor shall cover Products subject to deterioration with impervious sheet covering and provide ventilation to avoid condensation.

1.4.5. Contractor shall store loose granular materials on solid flat surfaces in a well-drained area and prevent mixing with foreign matter.

1.4.6. Contractor shall provide equipment and personnel to store Products by methods to prevent soiling, disfigurement, or damage.

1.4.7. Contractor shall arrange storage of Products to permit access for inspection and periodically inspect to assure Products are undamaged and are maintained under specified conditions.

END OF DOCUMENT

D0CUMENT 01 73 00

EXECUTION

1. GENERAL

1.1. RELATED DOCUMENTS AND PROVISIONS

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions;

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any);

1.1.4. Coordination and Project Meetings;

1.1.5. Submittals;

1.1.6. Materials and Equipment;

1.1.7. Cutting and Patching;

1.1.8. Contract Closeout and Final Cleaning; and

1.1.9. Commissioning.

1.2. SUMMARY

1.2.1. This Document includes general procedural requirements governing execution of the Work including, but not limited to, the following:

1.2.1.1. Construction layout;

1.2.1.2. Field engineering and surveying;

1.2.1.3. General installation of products;

1.2.1.4. Owner furnished, Contractor installed items;

1.2.1.5. Coordination of District-installed products;

1.2.1.6. Progress cleaning;

1.2.1.7. Staring and adjusting;

1.2.1.8. Protection of installed construction; and

1.2.1.9. Correction of the Work.

1.3. SUBMITTALS

1.3.1. Qualification Data: For land surveyor or professional engineer.

1.3.2. Certificates: Submit certificate signed by land surveyor or professional engineer certifying that location and elevation of improvements comply with requirements.

1.3.3. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept the materials as classified, for hazardous waste disposal.

1.3.4. Certified Surveys: Submit electronic files and three (3) paper copies signed by land surveyor or professional engineer.

1.3.5. Final Property Survey: Submit electronic files and three (3) paper copies showing the Work performed and records

1.3.6. Survey data.

2. EXECUTION

2.1. EXAMINATION

2.1.1. Existing Utilities: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning Site Work, investigate and verify the existence and location of underground utilities and other construction affecting the Work.

2.1.1.1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; and underground electrical services.

2.1.1.2. Furnish location data for Work related to Project that must be performed by public utilities serving the Project Site.

2.2. PREPARATION

2.2.1. Existing Utility Information: Furnish information to local utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

2.2.2. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

2.2.3. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

2.2.4. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to District per requirements of Document "Requests for Information." Include a detailed

description of problem encountered, together with recommendations for any necessary changes to the Contract Documents.

2.3. CONSTRUCTION LAYOUT

2.3.1. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify District and its consultant promptly.

2.3.2. General: Engage a land surveyor or professional engineer to lay out the Work using accepted surveying practices.

2.3.2.1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.

2.3.2.2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.

2.3.2.3. Inform installers of lines and levels to which they must comply.

2.3.2.4. Check the location, level and plumb, of every major element as the Work progresses.

2.3.2.5. Notify District and its consultant when deviations from required lines and levels exceed allowable tolerances.

2.3.2.6. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.

2.3.3. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and invert elevations.

2.3.4. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

2.3.5. Record Log: Maintain a log of layout control Work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by District and its consultant.

2.4. FIELD ENGINEERING

2.4.1. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.

2.4.1.1. Do not change or relocate existing benchmarks or control points without prior written approval of District and its consultant. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to District and its consultant before proceeding.

2.4.1.2. Require surveyor to replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

2.4.2. Benchmarks: Establish and maintain a minimum of two (2) permanent benchmarks on Project Site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.

2.4.2.1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.

2.4.2.2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.

2.4.2.3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

2.4.3. Records: Contractor shall maintain a complete, accurate log of all control and survey Work as it progresses. On request of District or Architect, Contractor shall submit documentation to verify accuracy of field engineering Work at no additional cost to the District.

2.4.4. Certified Survey: On completion of foundation walls, major site improvements, and other Work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.

2.4.5. Final Property Survey: Prepare and submit a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by land surveyor or professional engineer, that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey and are in conformance with Contract Documents.

2.4.5.1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a Site corner to a legal point.

2.4.6. Compliance with Laws: Contractor is responsible for meeting all applicable codes, OSHA, safety, and shoring requirements.

2.4.7. Nonconforming Work: Contractor is responsible for any re-surveying required by correction of nonconforming Work.

2.5. INSTALLATION

2.5.1. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

2.5.1.1. Make vertical Work plumb and make horizontal Work level.

2.5.1.2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.

2.5.1.3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.

2.5.1.4. Maintain minimum headroom clearance of 7 feet in spaces without a suspended ceiling.

2.5.2. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

2.5.3. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Completion.

2.5.4. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

2.5.5. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels where possible.

2.5.6. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

2.5.7. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.

2.5.7.1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by District.

2.5.7.2. Allow for building movement, including thermal expansion and contraction.

2.5.7.3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project Site in time for installation.

2.5.8. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

2.5.9. Hazardous Materials: Use products, cleaners, and installation materials that are not classed as hazardous per the MSDS sheets for the products where possible. If hazardous materials are necessary, inform District where and when they will be used no less than 48 hours before use. Take all recommended precautions of the materials' manufacturers to ensure safe use and clean-up.

2.6. DISTRICT-INSTALLED PRODUCTS

2.6.1. Site Access: Provide access to Project Site for District's construction forces.

2.6.2. Coordination: Coordinate construction and operations of the Work with work performed by District's construction forces.

2.6.2.1. Construction Schedule: Inform District of Contractor's preferred schedule for District's portion of the Work. Adjust Construction Schedule based on a mutually agreeable timetable. Notify District if changes to schedule are required due to differences in actual construction progress.

2.6.2.2. Pre-installation Conferences: Include District's construction forces at pre-installation conferences covering portions of the Work that are to receive District's work. Attend pre-installation conferences conducted by District's construction forces if portions of the Work depend on District's construction.

2.7. PROGRESS CLEANING

2.7.1. General: Clean Project Site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.

2.7.1.1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.

2.7.1.2. Do not hold materials more than seven (7) days during normal weather or three (3) days if the temperature is expected to rise above 80 degrees F.

2.7.1.3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations. Remove hazardous and unsanitary waste materials daily.

2.7.2. Site: Maintain Project Site free of waste materials and debris.

2.7.3. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.

2.7.3.1. Remove liquid spills promptly.

2.7.3.2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

2.7.4. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

2.7.5. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

2.7.6. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Completion.

2.7.7. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.

2.7.8. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Completion.

2.7.9. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

2.7.10. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

2.8. STARTING AND ADJUSTING

2.8.1. Start equipment and operating components to confirm proper operation. Replace or repair malfunctioning units and retest.

2.8.2. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.

2.8.3. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

2.8.4. Manufacturer's Field Service: If a factory-authorized service representative is required to inspect field-assembled components and equipment installation, comply with qualification requirements in Document "Quality Requirements."

2.9. PROTECTION OF INSTALLED CONSTRUCTION

2.9.1. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Completion.

2.9.2. Comply with manufacturer's written instruction for temperature and relative humidity unless otherwise addressed in the construction planning, sequences, and instructions. See Section 06 40 00 "Architectural Woodwork" for additional condition requirements of woodwork.

2.10. CORRECTION OF THE WORK

2.10.1. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Document "Cutting and Patching."

2.10.1.1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

2.10.2. Restore permanent facilities used during construction to their specified condition.

2.10.3. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

2.10.4. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

2.10.5. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF DOCUMENT

DOCUMENT 01 73 10

CUTTING AND PATCHING

1. GENERAL

1.1. RELATED DOCUMENTS AND PROVISIONS

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions, including, without limitation, Inspector, Inspections, and Tests, Integration of Work, Nonconforming Work, and Correction of Work, and Uncovering Work;

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any);

1.1.4. Hazardous Materials Procedures and Requirements;

1.1.5. Hazardous Materials Certification;

1.1.6. Lead-Based Materials Certification; and

1.1.7. Imported Materials Certification.

1.2. CUTTING AND PATCHING

1.2.1. Contractor shall be responsible for all cutting, fitting, and patching, including associated excavation and backfill, required to complete the Work or to:

1.2.1.1. Make several parts fit together properly.

1.2.1.2. Uncover portions of Work to provide for installation of ill-timed Work.

1.2.1.3. Remove and replace defective Work.

1.2.1.4. Remove and replace Work not conforming to requirements of Contract Documents.

1.2.1.5. Remove Samples of installed Work as specified for testing.

1.2.1.6. Provide routine penetrations of non-structural surfaces for installation of piping and electrical conduit.

1.2.1.7. Attaching new materials to existing remodeling areas – including painting (or other finishes) to match existing conditions.

1.2.2. In addition to Contract requirements, upon written instructions from District, Contractor shall uncover Work to provide for observations of covered Work in accordance with the Contract Documents, remove samples of installed materials for testing as directed by District, and remove Work to provide for alteration of existing Work.

1.2.3. Contractor shall not cut or alter Work, or any part of it, in such a way that endangers or compromises the integrity of the Work, the Project, or Work of others.

1.2.4. Contractor shall not cut and patch operating elements or safety related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operating elements include the following:

1.2.4.1. Primary operational systems and equipment.

1.2.4.2. Air or smoke barriers.

1.2.4.3. Fire-suppression systems.

1.2.4.4. Mechanical systems piping and ducts.

1.2.4.5. Control systems.

1.2.4.6. Communication systems.

1.2.4.7. Conveying systems.

1.2.4.8. Electrical wiring systems.

1.2.5. Contractor shall not cut and patch miscellaneous elements or related components in a manner that could change their load-carrying capacity, that results in reducing capacity to perform as intended, or that results in increased maintenance or decreased operational life of safety. Miscellaneous elements include the following:

1.2.5.1. Water, moisture or vapor barriers.

1.2.5.2. Membranes and flashings.

1.2.5.3. Exterior curtain-wall construction.

1.2.5.4. Equipment supports.

1.2.5.5. Piping, ductwork, vessels and equipment.

1.2.5.6. Noise and vibration control elements and systems.

1.2.5.7. Shoring, bracing and sheeting.

1.3. REQUEST TO CUT, ALTER, PATCH OR EXCAVATE

1.3.1. Contractor shall submit written notice to District pursuant to the applicable notice provisions of the Contract Documents, requesting consent to proceed with the cutting or alteration ("Request") at least ten (10) days prior to any cutting or alterations that may affect the structural safety of the Project, or Work of others, including the following:

1.3.1.1. The Work of the District or other trades.

1.3.1.2. Structural value or integrity of any element of the Project.

1.3.1.3. Integrity or effectiveness of weather-exposed or weather-resistant elements or systems.

1.3.1.4. Efficiency, operational life, maintenance or safety of operational elements.

1.3.1.5. Visual qualities of sight-exposed elements.

1.3.2. Contractor's Request shall also include:

1.3.2.1. Identification of the Project.

1.3.2.2. Description of affected Work.

1.3.2.3. Necessity for cutting, alterations, or excavations.

1.3.2.4. Impacts of that Work on the District, other trades, or structural or weatherproof integrity of the Project.

1.3.2.5. Description of proposed Work:

1.3.2.5.1. Scope of cutting, patching, alterations, or excavations.

1.3.2.5.2. Trades that will execute Work.

1.3.2.5.3. Products proposed to be used.

1.3.2.5.4. Extent of refinishing to be done.

1.3.2.6. Alternates to cutting and patching.

1.3.2.7. Cost proposal, when applicable.

1.3.2.8. The scheduled date the Work is to be performed and the duration of time to complete the Work.

1.3.2.9. Written permission of other trades whose Work will be affected.

1.4. QUALITY ASSURANCE

1.4.1. Contractor shall ensure that cutting, fitting, and patching shall achieve security, strength, weather protection, appearance for aesthetic match, efficiency, operational life, maintenance, safety of operational elements, and the continuity of existing fire ratings.

1.4.2. Contractor shall ensure that cutting, fitting, and patching shall successfully duplicate undisturbed adjacent profiles, materials, textures, finishes, and colors, and that materials shall match existing construction. Where there is dispute as to whether duplication is successful or has been achieved to a reasonable degree, the District's decision shall be final.

1.5. PAYMENT FOR COSTS

1.5.1. Costs caused by ill-timed or defective Work or Work not conforming to Contract Documents, including costs for additional services of the District or its consultants including but not limited to the Architect, inspector(s), engineers, and agents, will be paid by Contractor and/or deducted from the Contract Price by the District.

1.5.2. Contractor shall provide written cost proposals prior to proceeding with cutting and patching. District shall only pay for cost of Work if it is part of the Contract Price or if a change has been made to the Contract in compliance with the provisions of the General Conditions. Cost of Work performed upon instructions from the District, other than defective or nonconforming Work, will be paid by District on approval of written Change Order in accordance with the Contract Documents.

2. PRODUCTS

2.1. MATERIALS

2.1.1. Contractor shall provide for replacement and restoration of Work removed. Contractor shall comply with the Contract Documents and with the industry standard(s), for the type of Work, and the Specification requirements for each specific product involved. If not specified, Contractor shall recommend a product of a manufacturer or appropriate trade association for approval by the District.

2.1.2. Materials to be cut and patched include those damaged by the performance of the Work.

3. EXECUTION

3.1. INSPECTION

3.1.1. Contractor shall inspect existing conditions of the Site and the Work, including elements subject to movement or damage during cutting and patching, excavating and backfilling. After uncovering Work, Contractor shall inspect conditions affecting installation of new products.

3.1.2. Contractor shall report unsatisfactory or questionable conditions in writing to District as indicated in the General Conditions and shall proceed with Work as indicated in the General Conditions by District.

3.2. PREPARATION

3.2.1. Contractor shall provide shoring, bracing and supports as required to maintain structural integrity for all portions of the Project, including all requirements of the Project.

3.2.2. Contractor shall provide devices and methods to protect other portions of Project from damage.

3.2.3. Contractor shall, provide all necessary protection from weather and extremes of temperature and humidity for the Project, including without limitation any work that may be exposed by cutting and patching Work. Contractor shall keep excavations free from water.

3.3. ERECTION, INSTALLATION AND APPLICATION

3.3.1. With respect to performance, Contractor shall ensure its Subcontractors:

3.3.1.1. Execute fitting and adjustment of products to provide finished installation to comply with and match specified tolerances and finishes.

3.3.1.2. Execute cutting and demolition by methods that will prevent damage to other Work, and provide proper surfaces to receive installation of repairs and new Work.

3.3.1.3. Execute cutting, demolition excavating, and backfilling by methods that will prevent damage to other Work and damage from settlement.

3.3.1.4. Contractor shall use original installer or fabricator to perform cutting and patching for:

3.3.1.5. Weather-exposed surfaces and moisture-resistant elements such as roofing, sheet metal, sealants, waterproofing, and other trades.

3.3.1.6. Sight-exposed finished surfaces.

3.3.2. Contractor shall ensure its Subcontractors execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances, and finishes as shown or specified in the Contract Documents including, without limitation, the Drawings and Specifications.

3.3.3. Subcontractors shall fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces. Contractor shall conform to all Code requirements for penetrations or the Drawings and Specifications, whichever calls for a higher quality or more thorough requirement. Contractor shall maintain integrity of both rated and non-rated fire walls, ceilings, floors, etc.

3.3.4. Contractor's Subcontractors shall restore Work which has been cut or removed and install new products to provide completed Work in accordance with requirements of the Contract Documents and as required to match surrounding areas and surfaces.

3.3.5. Contractor's Subcontractors shall refinish all continuous surfaces to nearest intersection as necessary to match the existing finish to any new finish.

END OF DOCUMENT

DOCUMENT 01 77 00

CONTRACT CLOSEOUT AND FINAL CLEANING

1. GENERAL

1.1. RELATED DOCUMENTS

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions;

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any);

1.1.4. Submittals;

1.1.5. Operation and Maintenance Data;

1.1.6. Warranties;

1.1.7. Record Documents;

1.1.8. Demonstration and Training; and

1.1.9. Commissioning.

1.2. PRELIMINARY PROCEDURES

1.2.1. Before requesting inspection for determining date of Completion, complete the following. List items below that are incomplete in request.

1.2.1.1. Prepare a list of items to be completed and corrected ("Punch List"), the value of items on the list, and reasons why the Work is not complete.

1.2.1.2. Advise District of pending insurance changeover requirements.

1.2.1.3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.

1.2.1.4. Obtain and submit releases permitting District unrestricted use of the Work and access to services and utilities. Include certificate of occupancy, operating certificates, and similar releases, if required.

1.2.1.5. Prepare and submit Project Record Documents, operation and maintenance manuals, Completion construction photograph prints and electronic files, damage or settlement surveys, property surveys, and similar final record information.

1.2.1.6. Deliver tools, spare parts, extra materials, and similar items to location designated by District. Label with manufacturer's name and model number where applicable.

1.2.1.7. Make final changeover of permanent locks and deliver keys to District. Advise District's personnel of changeover in security provisions.

1.2.1.8. Complete startup testing of systems.

1.2.1.9. Submit test/adjust/balance records.

1.2.1.10. Terminate and remove temporary facilities from Project Site, along with mockups, construction tools, and similar elements.

1.2.1.11. Advise District of changeover in heat and other utilities.

1.2.1.12. Submit changeover information related to District's occupancy, use, operation, and maintenance.

1.2.1.13. Complete final cleaning requirements, including touch-up painting.

1.2.1.14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

1.3. RECORD DOCUMENTS AND SHOP DRAWINGS

1.3.1. Contractor shall legibly mark each item to record actual construction, including:

1.3.1.1. Measured depths of foundation in relation to finish floor datum.

1.3.1.2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permit surface improvements.

1.3.1.3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.

1.3.1.4. Field changes of dimension and detail.

1.3.1.5. Details not on original Contract Drawings

1.3.1.6. Changes made by modification(s).

1.3.1.7. References to related Shop Drawings and modifications.

1.3.1.8. Contractor will provide one set of Record Drawings to District.

1.3.1.9. Contractor shall submit all required documents to District and/or Architect prior to or with its final Application for Payment.

1.4. COMPLETION

1.4.1. Preliminary Procedures: Before requesting inspection for determining date of Completion, complete the following:

1.4.1.1. Submit a final Application for Payment according to the Contract Documents.

1.4.1.2. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

1.4.1.3. Submit pest-control final inspection report and warranty.

1.4.1.4. Instruction of District Personnel:

1.4.1.4.1. Before final inspection, at agreed upon times, Contractor shall instruct District's designated personnel in operation, adjustment, and maintenance of products, equipment, and systems.

1.4.1.4.2. For equipment requiring seasonal operation, Contractor shall perform instructions for other seasons within six (6) months.

1.4.1.4.3. Contractor shall use operation and maintenance manuals as basis for instruction. Contractor shall review contents of manual with personnel in detail to explain all aspects of operation and maintenance.

1.4.1.4.4. Contractor shall prepare and insert additional data in Operation and Maintenance Manual when need for such data becomes apparent during instruction.

1.4.1.4.5. Contractor shall use operation and maintenance manuals as basis for instruction. Contractor shall review contents of manual with personnel in detail to explain all aspects of operation and maintenance.

1.4.2. Inspection: Submit a written request for inspection.

1.4.3. **LIST OF INCOMPLETE ITEMS (PUNCH LIST)** Contractor shall notify District and Architect when Contractor considers the Work complete. Upon notification, District and Architect will prepare a list of minor items to be completed or corrected ("Punch List").

1.4.4. 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.

1.4.5. Contractor shall comply with Punch List procedures as provided herein and in the Contract Documents, and maintain the presence of a Project 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, District and Architect will inspect the Work and shall submit to Contractor a final inspection report noting the Work, if any, required in order to reach Completion in accordance with the Contract Documents. Absent unusual circumstances, this report shall consist of the Punch List items not yet satisfactorily completed and any additional Punch List items not originally included.

1.4.6. 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 District and Architect find the Work complete and acceptable under the Contract Documents, the District will notify Contractor, who shall then jointly submit to the Architect and District its final Application for Payment.

1.4.7. **Costs of Multiple Inspections**. More than two (2) requests of District to make a final inspection shall be considered an additional service of District, the Architect and/or the Inspector, and all subsequent costs will be invoiced to Contractor and withheld from remaining payments, if funds are available.

1.4.8. Punch List shall be deemed complete only upon the District's determination that all items on the Punch List, and all updates to the Punch List, are complete.

1.5. WARRANTIES

1.5.1. Submittal Time: Submit written warranties on request of District for designated portions of the Work where commencement of warranties is other than the date of Completion.

1.5.2. Organize warranty documents into an orderly sequence as required by the Division 01 Document "Warranties."

2. PRODUCTS

2.1. MATERIALS

2.1.1. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

3. EXECUTION

3.1. FINAL CLEANING

3.1.1. Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations. Contractor shall use cleaning methods and procedures that reduce the overall impact on human health and the natural environment by reducing the amount of disposed waste, pollution and environmental degradation. If Project is subject to LEED certification, Contractor shall ensure compliance with the applicable LEED requirements for final cleaning of the Site.

3.1.2. Contractor shall employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program.

3.1.2.1. Complete the following cleaning operations before requesting final inspection:

3.1.2.1.1. Clean Project Site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.

3.1.2.1.2. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.

3.1.2.1.3. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.

3.1.2.1.4. Remove tools, construction equipment, machinery, and surplus material from Project Site.

3.1.2.1.5. Remove snow and ice to provide safe access to building.

3.1.2.1.6. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.

3.1.2.1.7. Clean all surfaces and other work in accordance with recommendations of the manufacturer.

3.1.2.1.8. Remove spots, mortar, plaster, soil, and paint from ceramic tile, stone, and other finish materials.

3.1.2.1.9. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.

3.1.2.1.10. Sweep concrete floors broom clean in unoccupied spaces.

3.1.2.1.11. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.

3.1.2.1.12. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.

3.1.2.1.13. Remove labels that are not permanent.

3.1.2.1.14. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.

3.1.2.1.14.1. Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.

3.1.2.1.15. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.

3.1.2.1.16. Replace parts subject to unusual operating conditions.

3.1.2.1.17. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.

3.1.2.1.18. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.

3.1.2.1.19. Clean ducts, blowers, and coils if units were operated without filters during construction.

3.1.2.1.20. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

3.1.2.1.21. Leave Project Site clean and ready for occupancy.

3.1.3. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid Project of rodents, insects, and other pests.

3.1.4. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on District's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project Site and dispose of lawfully.

END OF DOCUMENT

DOCUMENT 01 78 23

OPERATION AND MAINTENANCE DATA

1. GENERAL

1.1. RELATED DOCUMENTS AND PROVISIONS

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions, including, without limitation, Completion of the Work;

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any);

1.1.4. Submittals;

1.1.5. Contract Closeout and Final Cleaning;

1.1.6. Warranties;

1.1.7. Record Documents;

1.1.8. Commissioning.

1.2. QUALITY ASSURANCE

1.2.1. Contractor shall prepare instructions and data by personnel experienced in maintenance and operation of described products.

1.3. FORMAT

1.3.1. Contractor shall prepare data in the form of an instructional manual entitled "OPERATIONS AND MAINTENANCE MANUAL AND INSTRUCTIONS" ("Manual").

1.3.2. Binders: Contractor shall use commercial quality, 8-1/2 by 11 inch, three-side rings, with durable plastic covers; two-inch maximum ring size. When multiple binders are used, Contractor shall correlate data into related consistent groupings.

1.3.3. Cover: Contractor shall identify each binder with typed or printed title "OPERATION AND MAINTENANCE MANUAL AND INSTRUCTIONS"; and shall list title of Project and identify subject matter of contents.

1.3.4. Contractor shall arrange content by systems process flow under section numbers and sequence of the Table of Contents of the Contract Documents.

1.3.5. Contractor shall provide tabbed fly leaf for each separate Product and system, with typed description of Product and major component parts of equipment.

1.3.6. Text: The content shall include Manufacturer's printed data, or typewritten data on 24 pound paper.

1.3.7. Drawings: Contractor shall provide with reinforced punched binder tab and shall bind in with text; folding larger drawings to size of text pages.

1.4. CONTENTS, EACH VOLUME

1.4.1. Table of Contents: Contractor shall provide title of Project; names, addresses, and telephone numbers of the Architect, any engineers, subconsultants, Subcontractor(s), and Contractor with name of responsible parties; and schedule of Products and systems, indexed to content of the volume.

1.4.2. For Each Product or System: Contractor shall list names, addresses, and telephone numbers of Subcontractor(s) and suppliers, including local source of supplies and replacement parts.

1.4.3. Product Data: Contractor shall mark each sheet to clearly identify specific Products and component parts, and data applicable to installation. Delete inapplicable information.

1.4.4. Drawings: Contractor shall supplement Product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Contractor shall not use Project Record Documents as maintenance drawings.

1.4.5. Text: The Contractor shall include any and all information as required to supplement Product data. Contractor shall provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

1.5. MANUAL FOR MATERIALS AND FINISHES

1.5.1. Building Products, Applied Materials, and Finishes: Contractor shall include Product data, with catalog number, size, composition, and color and texture designations. Contractor shall provide information for re-ordering custom manufactured Products.

1.5.2. Instructions for Care and Maintenance: Contractor shall include Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

1.5.3. Moisture Protection and Weather Exposed Products: Contractor shall include Product data listing applicable reference standards, chemical composition, and details of installation. Contractor shall provide recommendations for inspections, maintenance, and repair.

1.5.4. Additional Requirements: Contractor shall include all additional requirements as specified in the Specifications.

1.5.5. Contractor shall provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

1.6. MANUAL FOR EQUIPMENT AND SYSTEMS

1.6.1. Each Item of Equipment and Each System: Contractor shall include description of unit or system, and component parts and identify function, normal operating characteristics, and limiting conditions. Contractor shall include performance curves, with engineering data and tests, and complete nomenclature, and commercial number of replaceable parts.

1.6.2. Panelboard Circuit Directories: Contractor shall provide electrical service characteristics, controls, and communications.

1.6.3. Contractor shall include color coded wiring diagrams as installed.

1.6.4. Operating Procedures: Contractor shall include start-up, break-in, and routine normal operating instructions and sequences. Contractor shall include regulation, control, stopping, shut-down, and emergency instructions. Contractor shall include summer, winter, and any special operating instructions.

1.6.5. Maintenance Requirements: Contractor shall include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

1.6.6. Contractor shall provide servicing and lubrication schedule, and list of lubricants required.

1.6.7. Contractor shall include manufacturer's printed operation and maintenance instructions.

1.6.8. Contractor shall include sequence of operation by controls manufacturer.

1.6.9. Contractor shall provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

1.6.10. Contractor shall provide control diagrams by controls manufacturer as installed.

1.6.11. Contractor shall provide Contractor's coordination drawings, with color coded piping diagrams as installed.

1.6.12. Contractor shall provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

1.6.13. Contractor shall provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

1.6.14. Additional Requirements: Contractor shall include all additional requirements as specified in Specification(s).

1.6.15. Contractor shall provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

1.7. SUBMITTAL

1.7.1. Concurrent with the Schedule of Submittals as indicated in the General Conditions, Contractor shall submit to the District for review two (2) copies of a preliminary draft of proposed formats and outlines of the contents of the Manual.

1.7.2. For equipment, or component parts of equipment put into service during construction and to be operated by District, Contractor shall submit draft content for that portion of the Manual within ten (10) days after acceptance of that equipment or component.

1.7.3. On or before the Contractor submits its final application for payment, Contractor shall submit two (2) copies of a complete Manual in final form. The District will provide comments to Contractor and Contractor must revise the content of the Manual as required by District prior to District's approval of Contractor’s final Application for Payment.

1.7.4. Contractor must submit two (2) copies of revised Manual in final form within ten (10) days after receiving District’s comments. Failure to do so will be a basis for the District withholding funds sufficient to protect itself for Contractor’s failure to provide a final Manual to the District.

END OF DOCUMENT

DOCUMENT 01 78 36

WARRANTIES

1. GENERAL

1.1. RELATED DOCUMENTS AND PROVISIONS

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions, including, without limitation, Warranty/Guarantee/Indemnity;

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any);

1.1.4. Submittals;

1.1.5. Contract Closeout and Final Cleaning;

1.1.6. Operation and Maintenance Data;

1.1.7. Record Documents;

1.1.8. Commissioning.

1.2. FORMAT

1.2.1. Binders: Contractor shall use commercial quality, 8-1/2 by 11 inch, three-side rings, with durable plastic covers; two-inch maximum ring size.

1.2.2. Cover: Contractor shall identify each binder with typed or printed title "WARRANTIES" and shall list the title of Project.

1.2.3. Table of Contents: Contractor shall provide the title of Project; name, address, and telephone number of Contractor and equipment supplier, and name of responsible principal. Contractor shall identify each item with the number and title of the specific Specification, document, provision, or section in which the name of the Product or Work item is specified.

1.2.4. Contractor shall separate each Warranty with index tab sheets keyed to the Table of Contents listing, providing full information and using separate typed sheets as necessary. Contractor shall list each applicable and/or responsible Subcontractor(s), supplier(s), and/or manufacturer(s), with name, address, and telephone number of each responsible principal(s).

1.2.5. In addition to all Warranty documentation and information required herein, Contractor shall provide its Guarantee as required by the Contract Documents.

1.3. PREPARATION

1.3.1. Contractor shall obtain Warranties, executed in duplicate by each applicable and/or responsible Subcontractor(s), supplier(s), and manufacturer(s), within ten (10) days after

completion of the applicable item or Work. Except for items put into use with District's permission, Contractor shall leave date of beginning of time of Warranty until the date of Completion is determined.

1.3.2. Contractor shall verify that Warranties are in proper form, contain full information, and are notarized, when required.

1.3.3. Contractor shall co-execute submittals when required.

1.3.4. Contractor shall retain warranties until time specified for submittal.

1.4. TIME OF SUBMITTALS

1.4.1. Schedule of Warranties. Contractor shall provide District with a Schedule of Warranties at least fourteen (14) days prior to submitting its other required submittals indicated herein. This will provide District the opportunity to review the anticipated Warranties and make any comments, suggestions or revisions the District may require.

1.4.2. For equipment or component parts of equipment put into service during construction with District's permission, Contractor shall submit a draft Warranty for that equipment or component within ten (10) days after acceptance of that equipment or component.

1.4.3. On or before the Contractor submits its final application for payment, Contractor shall submit all Warranties and related documents in final form. The District shall indicate any Warranty-related Work that is being performed and incomplete at the time Contractor submits its final application for payment. District will provide comments to Contractor and Contractor must revise the content of the Warranties as required by District prior to District's approval of Contractor’s final Application for Payment.

1.4.4. For items of Work that are not completed until after the date of Completion, Contractor shall provide an updated Warranty for those item(s) of Work within ten (10) days after acceptance, listing the date of acceptance as start of the Warranty period.

END OF DOCUMENT

DOCUMENT 01 78 39

RECORD DOCUMENTS

1. GENERAL

1.1. RELATED DOCUMENTS AND PROVISIONS

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions, including, without limitation, Documents on Work and Completion of Work;

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any);

1.1.4. Submittals;

1.1.5. Contract Closeout and Final Cleaning;

1.1.6. Operation and Maintenance Data;

1.1.7. Warranties;

1.1.8. Commissioning.

2. RECORD DOCUMENTS OR DRAWINGS

2.1. GENERAL

2.1.1. "Record Documents" and "Record Drawings" may also be referred to in the Contract Documents as "As-Built Drawings."

2.1.2. As indicated in the Contract Documents, District will provide Contractor with one set of reproducible plans of the original Drawings.

2.1.3. Contractor shall maintain at each Project Site one (1) set of marked-up Drawings and shall transfer all changes and information to those marked-up Drawings, as often as required in the Contract Documents, but in no case less than once each month. Contractor shall submit to the Project Inspector one set of reproducible vellums of the Project Record Documents ("As-Builts") showing all changes incorporated into the Work since the preceding monthly submittal. The As-Builts shall be available at the Project Site. The Contractor shall submit reproducible vellums at the conclusion of the Project following review of the blueline prints.

2.1.4. Label and date each Record Document "RECORD DOCUMENT" in legibly printed letters.

2.1.5. All deviations in construction, including but not limited to pipe and conduit locations and deviations caused, without limitation, by Change Orders, Construction Directives, RFI's, and Addenda shall be accurately and legibly recorded by Contractor.

2.1.6. Locations and changes shall be done by Contractor in a neat and legible manner and, where applicable, indicated by drawing a "cloud" around the changed or additional information.

2.2. **RECORD DOCUMENT INFORMATION**

2.2.1. Contractor shall record the following information:

2.2.1.1. Locations of Work buried under or outside each building, including, without limitation, all utilities, plumbing and electrical lines, and conduits.

2.2.1.2. Actual numbering of each electrical circuit.

2.2.1.3. Locations of significant Work concealed inside each building whose general locations are changed from those shown on the Drawings.

2.2.1.4. Locations of all items, not necessarily concealed, which vary from the Contract Documents.

2.2.1.5. Installed location of all cathodic protection anodes.

2.2.1.6. Deviations from the sizes, locations, and other features of installations shown in the Contract Documents.

2.2.1.7. Locations of underground work, points of connection with existing utilities, changes in direction, valves, manholes, catch basins, capped stubouts, invert elevations, etc.

2.2.1.8. Sufficient information to locate Work concealed in each building with reasonable ease and accuracy.

2.2.2. In some instances, this information may be recorded by dimension. In other instances, it may be recorded in relation to the spaces in the building near which it was installed.

2.2.3. Contractor shall provide additional Drawings as necessary for clarification.

2.2.4. Contractor shall provide in an electronic format as indicated in the Contract Documents, a copy of the Drawings, made from final Shop Drawings marked "No Exceptions Taken" or "Approved as Noted."

2.2.4.1. With the District’s prior approval, Contractor may provide these reproducible Drawings in hard copy.

3. RECORD MATERIALS LOG

3.1.1. Materials Log shall be submitted prior to Completion.

3.1.2. Preparation: Mark Material Log to indicate the actual product installation where installation varies from that indicated in original Material Log.

3.1.3. Give particular attention to information on concealed materials and installations that cannot be readily identified and recorded later.

3.1.4. Mark copy with the proprietary name and characteristics of products, materials, and equipment furnished, including substitutions and product options selected.

3.1.5. Record the name of the manufacturer, supplier, installer, and other information necessary to provide a record of selections made.

3.1.6. The working copy of Materials Log shall be consistently maintained throughout construction, and shall be accessible at Project Site.

4. MAINTENANCE OF RECORD DOCUMENTS

4.1. Contractor shall store Record Documents apart from documents used for construction as follows:

4.1.1. Provide files and racks for storage of Record Documents.

4.1.2. Maintain Record Documents in a clean, dry, legible condition and in good order.

4.2. Contractor shall not use Record Documents for construction purposes.

END OF DOCUMENT

DOCUMENT 01 91 00

COMMISSIONING

1. GENERAL

1.1. RELATED DOCUMENTS AND PROVISIONS

Contractor shall review all Contract Documents for applicable provisions related to the provisions in this document, including without limitation:

1.1.1. General Conditions, including, without limitation, Documents on Work and Completion of Work;

1.1.2. Special Conditions (if any);

1.1.3. Supplemental Conditions (if any);

1.1.4. Submittals;

1.1.5. Contract Closeout and Final Cleaning;

1.1.6. Operation and Maintenance Data;

1.1.7. Warranties; and

1.1.8. Record Documents.

1.2. SUMMARY

1.2.1. Commissioning is a process for validating and documenting that the facility and its systems are constructed and perform in conformity with the Contract Documents.

1.2.2. The objective of the commissioning process is to verify that the performance of the facility and its systems meet or exceed the design intent.

1.2.3. Commissioning includes special facility start-up processes used to bring the facility to a fully operational state, free of deficiencies in an efficient and timely manner.

1.2.4. Training on related systems and equipment operation and maintenance shall be scheduled to commence only after start-up is complete and systems are verified to be 100% complete and functional.

1.3. DESCRIPTION

The following applies to all Contract Documents:

1.3.1. **Contractor Startup**: Sub-phase of Contractor's work ending with Acceptance of Work, during which Contractor performs a pre-planned program of activities including starting, testing, inspecting, adjusting balancing, correcting deficiencies and other similar activities.

1.3.1.1. The District, Construction Manager and Architect and the Inspector shall be present to observe, inspect and identify deficiencies in building systems operations.

1.3.2. The completion of startup means the entire Construction Project including startup and fine tuning has been performed to the requirements of the Contract Documents and is verified in writing by the District, Construction Manager and Architect.

1.3.3. **Fine Tuning**: Fine tuning is the responsibility of Contractors after District occupancy and ending one (1) year after District occupancy. During this time the Contractor is responsible for optimizing systems and correcting deficiencies arising under normal operating conditions.

1.3.3.1. Includes a period after occupancy where systems are optimized under "live" operating conditions and any outstanding construction deficiencies are corrected.

1.3.3.2. Fine Tuning shall extend from date of District occupancy to one year after occupancy.

1.4. DEFINITION OF TERMS

1.4.1. **Contractor's Pre-Commissioning Checklists**: Includes installation and start-up items as specified to be completed by the appropriate contractors prior to operational verification through the functional testing process.

1.4.2. **Installation Verification Process**: Includes the on-site inspection and review of related system components for conformance to Contract Documents. The Contractor shall verify systems readiness for functional testing procedures prior to the start of functional testing. Deficiencies will be documented by the Inspector for future resolution.

1.4.3. **Functional Performance Testing Process**: Includes the documented testing of system parameters, under actual or simulated operating conditions. Final performance commissioning of systems will begin only after the appropriate Contractor certifies that systems are 100% complete and ready for functional testing. The Contractor will be required to schedule, coordinate and perform device tests, calibration and functional performance test procedures.

1.4.4. **Deficiencies and Resolutions List:** Includes a list of noted deficiencies discovered as a result of the commissioning process. This list also includes the current disposition of issues, and the date of final resolution as confirmed by the Construction Manager and Inspector. Deficiencies are defined as those issues where products execution or performance does not satisfy the Project Contract Documents and/or the design intent.

1.5. COMMISSIONING SCHEDULE

1.5.1. Provide schedules for Contractor Start-Up work.

1.5.2. Incorporate in overall construction schedule.

1.5.3. Contractor's activities, which will be performed as specified under Fine Tuning, shall be completed within one (1) year from date of occupancy by the District.

1.6. CONTRACTOR RESPONSIBILITIES

1.6.1. Provide utility services required for the commissioning process.

1.6.2. Contractor is responsible for construction means, methods, job safety, and/or management function related to commissioning on the Project Site.

1.6.3. Contractor shall assign representatives with expertise and authority to act on behalf of Contractor and schedule the representatives to participate in and perform commissioning team activities including, but not limited to, the following:

1.6.3.1. Participate in design and construction-phase coordination meetings.

1.6.3.2. Participate in maintenance orientation and inspection.

1.6.3.3. Participate in operation and maintenance training sessions.

1.6.3.4. Participate in final review.

1.6.3.5. Certify that Work is complete and systems are operational according to the Contract Documents, including calibration of instrumentation and controls.

1.6.3.6. Evaluate performance deficiencies identified in test reports and, in collaboration with entity responsible for system and equipment installation, recommend corrective action.

1.6.3.7. Review and comment on final commissioning documentation.

1.6.4. Contractor shall integrate all commissioning activities into Contractor's Construction Schedule.

1.6.5. Contractor's Subcontractors shall assign representatives with expertise and authority to act on behalf of subcontractors and schedule the representatives to participate in and perform commissioning team activities including, but not limited to, the following:

1.6.5.1. Participate in design and construction-phase coordination meetings.

1.6.5.2. Participate in maintenance orientation and inspection.

1.6.5.3. Participate in procedures meeting for testing.

1.6.5.4. Participate in final review.

1.6.5.5. Provide schedule for operation and maintenance data submittals, equipment startup, and testing to Commissioning Authority for incorporation into the commissioning plan. Update schedule on a weekly basis throughout the construction period.

1.6.5.6. Provide information to the Commissioning Authority for developing construction phase commissioning plan.

1.6.5.7. Participate in training sessions for District's operation and maintenance personnel.

1.6.5.8. Provide updated Project Record Documents to Commissioning Authority on a daily basis.

1.6.5.9. Gather and submit operation and maintenance data for systems, subsystems, and equipment to the Commissioning Authority, as specified in Division 01 Document "Operation and Maintenance Data."

1.6.5.10. Provide technicians who are familiar with the construction and operation of installed systems, who shall execute the test procedures developed by the Commissioning Authority, and who shall participate in testing of installed systems, subsystems, and equipment.

1.7. SUBMITTALS

1.7.1. Submit Draft and Final Contractor Start-up Forms as described in this Document. Submit Draft Report for Construction Manager and Architect's review and comment prior to Final Submission. Submit Final Report not later than twenty weeks before scheduled date of Acceptance of Work.

1.7.2. Prepare and submit one copy of report form to be used in preparation of system reports for:

1.7.2.1. Food Service Equipment.

1.7.2.2. Gymnasium Equipment and Scoreboards

1.7.2.3. Laboratory Fume Hoods

1.7.2.4. Elevators

1.7.2.5. Each mechanical system specified in Division 15.

1.7.2.6. Each Electrical system specified in Division 16.

1.7.3. Each System Report shall be submitted including the following:

1.7.3.1. Project Name

1.7.3.2. Name of System

1.7.3.3. Index of report's content

1.7.3.4. Adjacent to list of equipment, columns to indicate status of equipment operation, to date and to sign off equipment start-up.

1.7.3.5. Space to record equipment and operational problems which cannot be corrected with scheduled Contractor Start-Up program and which may delay Acceptance of Work.

1.7.3.6. Manufacturer's equipment start-up reports.

1.7.3.7. Systems' testing, balancing, and adjusting reports.

1.7.3.8. Equipment Report Forms shall include the following: Project name, name of equipment, starting and testing procedures to be performed and observations and test results to be recorded.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Electric motors.
2. Motor starters.
3. Gauges.
4. Thermometers.
5. Flexible joints.
6. Insulation.

1.2 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract apply to this Section.

1.3 ADDITIONAL REQUIREMENTS

A. Furnish and install any incidental work not shown or specified which is necessary to provide a complete and workable system.

B. Make all temporary connections required to maintain services during the course of this Contract without additional cost to the Owner. Notify the Owner seven days in advance before disturbing any service.

C. Plumbing work done under this contract shall not adversely affect the operation of the existing plumbing systems.

1.4 REFERENCES AND STANDARDS

A. Where material or equipment is specified to conform to referenced standards, it shall be assumed that the most recent edition of the standard in effect at the time of bid shall be used.
1. CSA – Canadian Standards Association International.
2. ANSI - American National Standards Institute.
3. ASTM - American Society for Testing and Materials.
4. CCR - California Code of Regulations.
a. Title 8 - Division of Industrial Safety, Subchapter 7; General Industry Safety Orders, Articles 31 through 36.
5. NCPWB - National Certified Pipe Welding Bureau.
6. CEC - California Electrical Code.
7. NEMA - National Electrical Manufacturers' Association.
8. NFPA - National Fire Protection Association.
9. OSHA - Occupational Safety and Health Act.
10. UL - Underwriters' Laboratories, Inc.

B. Requirements of Regulatory Agencies:
1. The publications listed below form part of this specification; comply with provisions of these publications except as otherwise shown or specified.
a. California Building Code, 2019.
b. California Electrical Code, 2019.
c. California Energy Code, 2019.

d. California Fire Code, 2019.
e. California Mechanical Code, 2019.
f. California Plumbing Code, 2019.
g. California Code of Regulations, Title 24.
h. California Health and Safety Code.
i. CAL-OSHA.
j. California State Fire Marshal, Title 19 CCR.
k. National Fire Protection Association.
l. Occupational Safety and Health Administration.
m. Other applicable state laws.

2. Nothing in Drawings or specifications shall be construed to permit work not conforming to these codes, or to requirements of authorities having jurisdiction. It is not the intent of Drawings or specifications to repeat requirements of codes except where necessary for clarity.

1.5 DRAWINGS

A. Examine Contract Documents prior to bidding of work and report discrepancies in writing to Architect.

B. Drawings showing location of equipment and materials are diagrammatic and job conditions will not always permit installation in location shown. The Plumbing Drawings show general arrangement of equipment and materials, etc., and shall be followed as closely as existing conditions, actual building construction, and work of other trades permit.
1. Architectural and Structural Drawings shall be considered part of the Work. These Drawings furnish Contractor with information relating to design and construction of the Project. Architectural Drawings take precedence over Plumbing Drawings.
2. Because of the small scale of Plumbing Drawings, not all offsets, fittings, and accessories required are shown. Investigate structural and finish conditions affecting the Work and arrange Work accordingly. Provide offsets, fittings, and accessories required to meet conditions. Inform Architect immediately when job conditions do not permit installation of equipment and materials in the locations shown. Obtain the Architects approval prior to relocation of equipment and materials.
3. Relocate equipment and materials installed without prior approval of the Architect. Remove and relocate equipment and materials at Contactors' expense upon Architects' direction.
4. Minor changes in locations of equipment, piping, etc., from locations shown shall be made when directed by the Architect at no additional cost to the Owner providing such change is ordered before such items of work, or work directly connected to same are installed and providing no additional material is required.

C. Execute work mentioned in Specifications and not shown on Drawings, or vice versa, the same as if specifically mentioned or shown in both.

1.6 FEES AND PERMITS

A. Obtain and pay for all permits and service required in installation of this work; arrange for required inspections and secure approvals from authorities having jurisdiction. Comply with requirements of Division 01.

B. Arrange for utility connections and pay charges incurred, including excess service charges.
1. Bear the cost of construction related to utility services, from point of connection to utility services shown on Contract Documents. This includes piping, excavation, backfill, meters, boxes, check valves, backflow prevention devices, general service valves, concrete work,

and the like, whether or not Work is performed by Contractor, local water/sanitation district, public utility, other governmental agencies or agencies' assigns.

C. Coordination:
1. General:
a. Coordinate plumbing Work with trades covered in other Specifications Sections to provide a complete, operable and sanitary installation of the highest quality workmanship.
2. Electrical Coordination:
a. Refer to the Electrical Drawings and Specifications, Division 26, for service voltage and power feed wiring for equipment specified under this section. Contractor has full responsibility for the following items of work:
1) Review the Electrical Drawings and Division 26 Specifications to verify that electrical services provided are adequate and compatible with equipment requirements.
2) If additional electrical services are required above that indicated on Electrical Drawings and in Division 26, such as more control interlock conductors, larger feeder, or separate 120 volt control power source, include cost to furnish and install additional electrical services as part of the bid.
3) Prior to proceeding with installation of additional electrical work, submit detailed drawings indicating exact scope of additional electrical work.
3. Mechanical Coordination:
a. Arrange for pipe spaces, chases, slots and openings in building structure during progress of construction, to accommodate mechanical system installation.
b. Coordinate installation of supporting devices. Set sleeves in poured-in-place concrete and other structural components during progress of construction.
c. Coordinate requirements for access panels and doors for mechanical items requiring access where concealed behind finished surfaces. Access panels and doors are specified in Division 08 Section "Access Doors and Frames."
d. Coordinate with other trades equipment locations, pipe, duct and conduit runs, electrical outlets and fixtures, air inlets and outlets, and structural and architectural features. Provide information on location of piping and seismic bracing to other trades as required for a completely coordinated project.

1.7 SUBMITTALS - GENERAL

A. Refer to Division 01 Submittals Section(s) for additional requirements.

B. Submittal packages may be submitted via email as PDF electronic files, or as printed packages. PDFs shall be legible at actual size (100 percent). Provide seven copies of printed submittal packages.

C. Provide submittal of materials proposed for use as part of this Project. Product names in Specifications and on Drawings are used as standards of quality. Furnish standard items on specified equipment at no extra cost to the Contract regardless of disposition of submittal data. Other materials or methods shall not be used unless approved in writing by Architect. Architect's review will be required even though "or equal" or synonymous terms are used.
1. Partial or incomplete submittals will not be considered.
2. Quantities are Contractor's responsibility and will not be reviewed.
3. Provide materials of the same brand or manufacturer for each class of equipment or material.
4. Identify each item by manufacturer, brand, trade name, number, size, rating, or other data necessary to properly identify and review materials and equipment. Words "as specified" are not sufficient identification.

5. Identify each submittal item by reference to items' Specification Section number and paragraph, by Drawing and detail number, and by unit tag number.
6. Organize submittals in same sequence as in Specification Sections.
7. Show physical arrangement, construction details, finishes, materials used in fabrications, provisions for piping entrance, access requirements for installation and maintenance, physical size, mechanical characteristics, foundation and support details, and weight.
    a. Submit Shop Drawings, performance curves, and other pertinent data, showing size and capacity of proposed materials.
    b. Specifically indicate, by drawn detail or note, that equipment complies with each specifically stated requirement of Contract Documents.
    c. Drawings shall be drawn to scale and dimensioned (except schematic diagrams). Drawings may be prepared by vendor but must be submitted as instruments of Contractor, thoroughly checked and signed by Contractor before submission to Architect for review.
    d. Catalog cuts and published material may be included with supplemental scaled drawings.

D. Review of submittals will be only for general conformance with design concept and general compliance with information given in Contract Documents. Review will not include quantities, dimensions, weights or gauges, fabrication processes, construction methods, coordination with work of other trades, or construction safety precautions, which are sole responsibility of Contractor. Review of a component of an assembly does not indicate acceptance of an assembly. Deviations from Contract Documents not clearly identified by Contractor are Contractor's responsibility and will not be reviewed by Architect.

E. Within reasonable time after award of contract and in ample time to avoid delay of construction, submit to Architect Shop Drawings or submittals on all items of equipment and materials provided. Provide submittal in at least seven copies and in complete package.
    1. Shop Drawings and submittals shall include Specification Section, Paragraph number, and Drawing unit symbol or detail number for reference. Organize submittals into booklets for each Specification section and submit in loose-leaf binders with index. Deviations from the Contract Documents shall be prominently displayed in the front of the submittal package and referenced to the applicable Contract requirement.

F. Furnish to the Project Inspector complete installation instructions on material and equipment before starting installation.

1.8 ACTION SUBMITTALS

A. Product Data: Submit manufacturer's technical product data and installation instructions for plumbing systems materials and products.

B. Shop Drawings.

C. Pipe, pipe or plumbing fittings, fixtures, solder and flux installed in a system providing water for human consumption shall comply with lead free requirements of the California Health and Safety Code Section 116875. Provide submittal information for products third-party certified by an approved laboratory as complying with California Health and Safety Code Section 116875.

D. Delegated-Design Submittals: For seismic supports, anchorages, restraints, and vibration isolators indicated to comply with performance requirements and design criteria.
    1. Calculations performed for use in selection of seismic supports, anchorages, and restraints shall utilize criteria indicated in Structural Contract Documents.
    2. Include design calculations and details for selecting vibration isolators and vibration isolation bases complying with performance requirements, design criteria, and analysis

data signed and sealed by the California registered structural engineer responsible for their preparation.

3. Supports, anchorages and restraints for piping, ductwork, and equipment shall be an HCAI pre-approved system such as TOLCO, ISAT, Mason, or equal. Pipes, ducts and equipment shall be seismically restrained in accordance with requirements of current edition of California Building Code. System shall have current OPM number and shall meet additional requirements of authority having jurisdiction. Provide supporting documentation required by the reviewing authority and the Architect and Engineer. Provide layout drawings showing piping, ductwork and restraint locations.
   a. Bracing of Piping and Equipment: Specifically state how bracing attachment to structure is accomplished. Provide shop drawings indicating seismic restraints, including details of anchorage to building. In-line equipment must be braced independently of piping, and in conformance with applicable building codes. Provide calculations to show that pre-approval numbers have been correctly applied in accordance with general information notes of pre-approval documentation.
   b. In lieu of the above or for non-standard installations not covered in the above pre-approved systems, Contractor shall provide layout drawings showing piping, ductwork, and restraint locations, and detail supports, attachments and restraints, and furnish supporting calculations and legible details sealed by a California registered structural engineer, in accordance with California Building Code
4. Additional Requirements: In addition to the above, conform to all state and local requirements.

1.9 INFORMATIONAL SUBMITTALS

A. Provide layouts for plumbing systems, for inclusion in coordinated layout specified in Section 238000. Comply with requirements for layouts specified in Section 238000.

1.10 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data:
   1. Refer to Division 01 for complete instructions.
   2. Furnish three complete sets of Operation and Maintenance Manual bound in hardboard binder, and one compact disc containing complete Operation and Maintenance Manual in searchable PDF format. Provide Table of Contents. Provide index tabs for each piece of equipment in binder and disc. Begin compiling data upon approval of submittals.
      a. Sets shall incorporate the following:
         1) Product Data.
         2) Shop Drawings.
         3) Record Drawings.
         4) Service telephone number, address and contact person for each category of equipment or system.
         5) Complete operating and maintenance instructions for each item of plumbing equipment and systems.
         6) Copies of guarantees/warrantees for each item of equipment and systems.
         7) Test data and system balancing reports.
         8) Typewritten maintenance instructions for each item of equipment listing lubricants to be used, frequency of lubrication, inspections required, adjustment, etc.
         9) Manufacturers' bulletins with parts numbers, instructions, etc., for each item of equipment.
         10) Control diagrams and literature.
         11) A complete list or schedule of all scheduled valves giving the number of the valve, location and the rooms or area controlled by the valve. Identify each valve with a permanently attached metal tag stamped with number to match

schedule. Post list in frame under plastic on wall in mechanical room or where directed by Architect.

12) Check test and start reports for each piece of plumbing equipment provided as part of the Work.

13) Commissioning and Preliminary Operation Tests required as part of the Work.

b. Post service telephone numbers and/or addresses in an appropriate place as designated by the Architect.

B. Record Drawings:

1. Refer to Division 01, Record Documents, for requirements governing Work specified herein.
2. Upon completion of the work, deliver to Architect the following:
   a. Originals of drawings showing the Work exactly as installed.
   b. One complete set of reproducible drawings showing the Work exactly as installed.
   c. One compact disc with complete set of drawings in PDF format showing the Work exactly as installed.
   d. Provide Contractor's signature, verifying accuracy of record drawings.
   e. Obtain the signature of the Project Inspector for all record drawings.

1.11 SUBSTITUTIONS

A. Refer to Division 01 for complete instructions. Requirements given below are in addition to or are intended to amplify Division 01 requirements. In the case of conflict between requirements given herein and those of Division 01, Division 01 requirements shall apply.

B. It is the responsibility of Contractor to assume costs incurred because of additional work and or changes required to incorporate proposed substitute into the Project. Refer to Division 01 for complete instructions.

C. Substitutions will be interpreted to be all manufacturers other than those specifically listed in the Contract Documents by brand name, model or catalog number.

D. Only one request for substitution will be considered for each item of equipment or material.

E. Substitution requests shall include the following:

1. Reason for substitution request.
2. Complete submittal information as described herein; see "Submittals."
3. Coordinated scale layout drawings depicting position of substituted equipment in relation to other work, with required clearances for operation, maintenance and replacement.
4. List optional features required for substituted equipment to meet functional requirements of the system as indicated in Contract Documents.
5. Explanation of impact on connected utilities.
6. Explanation of impact on structural supports.

F. Installation of reviewed substitution is the Contractors' responsibility. Any mechanical, electrical, structural, or other changes required for installation of reviewed substituted equipment or material must be made by the Contractor without additional cost to the Owner. Review by the Architect of the substituted equipment or material, including dimensioned Drawings will not waive these requirements.

G. Contractor may be required to compensate the Architect for costs related to substituted equipment or material.

1.12 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of plumbing systems products, of types, materials, and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years.

B. Contractor's Qualifications: Firm with at least 5 years of successful installation experience on projects with plumbing systems work similar to that required for this Project.

C. California Health and Safety Code Compliance: For products covered under the scope of HSC 116875 for potable water service. Products for potable water service shall be third-party certified by an approved laboratory as complying with California Health and Safety Code Section 116875.

D. Comply with applicable portions of California Plumbing Code pertaining to selection and installation of plumbing materials and products.

E. All materials and products shall be new and shall match existing.

1.13 DELIVERY, STORAGE, AND HANDLING

A. Protect equipment and piping delivered to Project site from weather, humidity and temperature variations, dirt, dust and other contaminants.

1.14 FIELD CONDITIONS

A. Contractor shall visit Project site and examine existing conditions in order to become familiar with Project scope. Verify dimensions shown on Drawings at Project site. Bring discrepancies to the attention of Architect. Failure to examine Project site shall not constitute basis for claims for additional work because of lack of knowledge or location of hidden conditions that affect Project scope.

B. Information on Drawings relative to existing conditions is approximate. Deviations from Drawings necessary during progress of construction to conform to actual conditions shall be approved by the Architect and shall be made without additional cost to the Owner. The Contractor shall be held responsible for damage caused to existing services. Promptly notify the Architect if services are found which are not shown on Drawings.

1.15 WARRANTY

A. Refer to Division 01 for warranty requirements, and duration and effective date of Contractor’s Standard Guarantee.

B. Repair or replace defective work, material, or part that appears within the warranty period, including damage caused by leaks.

C. On failure to comply with the warranty requirements within a reasonable length of time after notification is given, the Architect/Owner shall have the repairs made at the Contractor's expense.

PART 2 - PRODUCTS

2.1 GENERAL

A. Materials or equipment of the same type shall be of the same brand wherever possible. All materials shall be new and in first class condition.

B. All sizes, capacities, and efficiency ratings shown are minimum, except that gas capacity is maximum available.

C. Refer to Sections 221000 and 238000 for specific system piping materials.

2.2 MATERIALS AND PRODUCTS

A. No material installed as part of this Work shall contain asbestos.

B. Insulation products, including insulation, insulation facings, jackets, adhesives, sealants and coatings shall not contain polybrominated diphenyl ethers (PBDEs) in penta, octa, or deca formulations in amounts greater than 0.1 percent (by mass).

2.3 ELECTRIC MOTORS

A. General Motor Requirements: Comply with NEMA MG 1 unless otherwise indicated. Comply with IEEE 841 for severe-duty motors.
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or equal:
      a. U.S. Motors.
      b. Century Electric.
      c. General Electric.
      d. Lincoln.
      e. Gould.

B. Motor Characteristics: Designed for continuous duty at ambient temperature of 40 deg. C and at altitude of 3300 feet above sea level. Capacity and torque shall be sufficient to start, accelerate, and operate connected loads at designated speeds, at installed altitude and environment, with indicated operating sequence, and without exceeding nameplate ratings or considering service factor.
   1. Motors exceeding the nameplate amperage shall be promptly replaced at no cost to the Owner. Horsepower shown is minimum and shall be increased as necessary to comply with above requirements. Furnish motors with splash-proof or weatherproof housings, where required or recommended by the manufacturer. Match the nameplate voltage rating with the electrical service supplied. Check Electrical Drawings. Provide a transformer for each motor not wound specifically for system voltage.

C. Polyphase Motors: NEMA MG 1, Design B, medium induction motor, premium efficiency as defined in NEMA MG 1. Select motors with service factor of 1.15. Provide motor with random-wound, squirrel cage rotor, and permanently lubricated or regreasable, shielded, antifriction ball bearings suitable for radial and thrust loading. Temperature rise shall match insulation rating. Provide Class F insulation.
   1. Multispeed motors shall have separate windings for each speed.

D. Polyphase Motors with Additional Requirements:

1. Motors Used with Reduced-Voltage and Multispeed Controllers: Match wiring connection requirements for controller with required motor leads. Provide terminals in motor terminal box, suited to control method.
2. Motors Used with Variable Frequency Controllers:
   a. Separately Connected Motors: Ratings, characteristics, and features coordinated with and approved by controller manufacturer.
   b. Windings: Copper magnet wire with moisture-resistant insulation varnish, designed and tested to resist transient spikes, high frequencies, and short time rise pulses produced by pulse-width modulated inverters.
   c. Energy- and Premium-Efficient Motors: Class B temperature rise; Class F insulation.
   d. Inverter-Duty Motors: Class F temperature rise; Class H insulation.
   e. Thermal Protection: Comply with NEMA MG 1 requirements for thermally protected motors.
   f. Each motor shall be provided with a shaft grounding device for stray current protection.
3. Severe-Duty Motors: Comply with IEEE 841, with 1.15 minimum service factor.

E. Single-Phase Motors:
1. Select motors with service factor of 1.15.
2. Motors larger than 1/20 hp shall be one of the following, to suit starting torque and requirements of specific motor application:
   a. Permanent-split capacitor.
   b. Split phase.
   c. Capacitor start, inductor run.
   d. Capacitor start, capacitor run.
3. Multispeed Motors: Variable-torque, permanent-split-capacitor type.
4. Bearings: Prelubricated, antifriction ball bearings or sleeve bearings suitable for radial and thrust loading.
5. Motors 1/20 HP and Smaller: Shaded-pole type.

F. Thermal Protection: Internal protection to automatically open power supply circuit to motor when winding temperature exceeds a safe value calibrated to temperature rating of motor insulation. Thermal-protection device shall automatically reset when motor temperature returns to normal range.

2.4 MOTOR STARTERS

A. Square D, Allen Bradley, or equal, in NEMA Type 1 enclosure, unless otherwise specified or required. Minimum starter size shall be Size 1. Provide NEMA 3R enclosure where exposed to outdoors.

B. Provide magnetic motor starters for equipment provided under the Mechanical Work. Starters shall be non-combination type. Provide part winding or reduced voltage start motors where shown or as hereinafter specified. Minimum size starter shall be Size 1.
1. All starters shall have the following:
   a. Cover mounted hand-off-automatic switch. Starters installed exposed in occupied spaces shall have key operated HOA switch.
   b. Ambient compensated thermal overload.
   c. Fused control transformer (for 120 or 24 volt service).
   d. Pilot lights, integral with the starters. Starters located outdoors shall be in NEMA IIIR enclosures.
2. Where three phase motors are provided for two-speed operation, provide two speed motor starters.
3. Starters for single-phase motors shall have thermal overloads. NEMA I enclosure for starters located indoors, NEMA IIIR enclosure for starters located outdoors.

4. Provide OSHA label indicating the device starts automatically.

2.5 GAUGES

A. Marsh "Series J", U.S. Gage, Danton 800, or equal, with bronze bushed movement and front recalibration. Dials shall be white with black numerals, 3-1/2 inch dial face. Normal reading shall be at mid-scale. Provide a needle valve on each gauge connection. Supply a gauge piped with branch isolation valves across the inlet and outlet of each pump and where shown on the Drawings.

B. Provide Pete's Plug II, Sisco P/T, or equal, test plug with Nordel core {and gasketed cap}, on inlet and outlet of each coil, boiler, condenser, chiller and heat exchanger and where shown on Drawings.

2.6 THERMOMETERS

A. Marsh, Taylor, Palmer, or equal, 5 inch diameter bimetal dial, adjustable from face, with adjustable positioner, located to be easily read from normal personnel approach. Normal reading shall be at mid-scale.
   1. Provide extension for insulation.
   2. Provide thermometers with steel bulb chambers and brass separable sockets.

B. Provide Pete's Plug II, Sisco P/T, or equal, test plug with Nordel core, on inlet and outlet of each coil, boiler, and heat exchanger and provide two digital electronic test thermometers for each range of fluid temperature and where shown on Drawings.

2.7 EQUIPMENT IDENTIFICATION

A. Identify each piece of equipment with a permanently attached engraved bakelite plate, 1/2 inch high white letters on black background.

2.8 PIPE IDENTIFICATION

A. Identify each piping system and indicate the direction of flow by means of Seton, Inc., Marking Services Inc., Reef Industries, Inc., or equal, pre-tensioned, coiled semi-rigid plastic pipe labels formed to circumference of pipe, requiring no fasteners or adhesive for attachment to pipe.

B. The legends and flow arrows shall conform to ASME A13.1.

2.9 INSULATION WORK

A. General:
   1. For insulating domestic hot water pumps, refer to Section 225000, Plumbing Equipment,
   2. Insulation products, including insulation, insulation facings, jackets, adhesives, sealants and coatings shall not contain polybrominated diphenyl ethers (PBDEs) in penta, octa, or deca formulations in amounts greater than 0.1 percent (by mass).
   3. Adhesives and sealants shall comply with testing and product requirements of South Coast Air Quality Management District, Rule 1168.
   4. The term "piping" used herein includes pipe, valves, strainers and fittings.
   5. Apply insulating cement to fittings, valves and strainers and trowel smooth to the thickness of adjacent covering. Cover with jacket to match piping. Extend covering on valves up to the bonnet. Leave strainer cleanout plugs accessible.
   6. Provide pre-formed PVC valve and fitting covers.

7. Provide Calcium Silicate rigid insulation and sheet metal sleeve, 18 inch minimum length at each pipe hanger. Seal ends of insulation to make vapor tight with jacket.
8. Test insulation, jackets and lap-seal adhesives as a composite product and confirm flame spread of not more than 25 and a smoke developed rating of not more than 50 when tested in accordance with UL723 or ASTM E84.
9. Clean thoroughly, test and have approved, all piping and equipment before installing insulation and/or covering.
10. Repair all damage to existing pipe and equipment insulation whether or not caused during the work of this contract, to match existing adjacent insulation for thickness and finish, but conforming to flame spread and smoke ratings specified above.

B. Insulation of Piping:
1.
2.

PART 3 - EXECUTION

3.1 EXISTING MATERIALS

A. Remove existing equipment, piping, wiring, construction, etc., which interferes with Work of this Contract. Promptly return to service upon completion of work in the area. Replace items damaged by Contractor with new material to match existing.

B. Removed materials which will not be re-installed and which are not claimed by Owner shall become property of Contractor and shall be removed from Project site. Consult Owner before removing any material from Project site. Carefully remove materials claimed by Owner to prevent damage and deliver to Owner-designated storage location.

C. Existing piping and wiring not reused and are concealed in building construction may be abandoned in place and all ends shall be capped or plugged. Remove unused piping and wiring exposed in Equipment Rooms or occupied spaces. Material shall be removed from Project premises. Disconnect power, water, gas, pump or any other active energy source from piping or electrical service prior to abandoning in place.

D. Existing piping, ductwork, and equipment modified or altered as part of this Work shall comply with the most recent applicable code requirements.

3.2 FRAMING, CUTTING AND PATCHING

A. Special framing, recesses, chases and backing for Work of this Section, unless otherwise specified, are covered under other Specification Sections.

B. Contractor is responsible for placement of pipe sleeves, hangers, inserts, supports, and location of openings for the Work.

C. Cutting, patching, and repairing of existing construction to permit installation of equipment, and materials is the responsibility of Contractor. Repair or replace damage to existing work with skilled mechanics for each trade.

D. Cut existing concrete construction with a concrete saw. Do not utilize pneumatic devices.

E. Core openings through existing construction for passage of new piping and conduits. Cut holes of minimum diameter to suit size of pipe and associated insulation installed. Coordinate with

building structure, and obtain Structural Engineer's approval prior to coring through existing construction.

3.3 PLUMBING DEMOLITION

A. Refer to Division 01 Sections “Cutting and Patching” and “Selective Demolition” for general demolition requirements and procedures.

B. Disconnect, dismantle and remove mechanical systems, equipment, and components indicated to be removed. Coordinate with all other trades.
   1. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
   2. Piping to Be Abandoned in Place: Drain piping and cap or plug piping to remain with same or compatible piping material. Refrigerant system must be evacuated per EPA requirements.
   3. Equipment to Be Removed: Drain down and cap remaining services and remove equipment.
   4. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
   5. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.

C. If pipe, insulation, or equipment to remain is damaged in appearance or is unserviceable, remove damaged or unserviceable portions and replace with new products of equal capacity and quality.

3.4 ELECTRICAL REQUIREMENTS

A. Provide adequate working space around electrical equipment in compliance with the California Electrical Code. Coordinate the Mechanical Work with the Electrical Work to comply.

B. Furnish necessary control diagrams and instructions for the controls. Before permitting operation of any equipment which is furnished, installed, or modified under this Section, review all associated electrical work, including overload protection devices, and assume complete responsibility for the correctness of the electrical connections and protective devices. Motors and control equipment shall conform to the Standards of the National Electrical Manufacturers' Association. All equipment and connections exposed to the weather shall be NEMA IIIR with factory-wired strip heaters in each starter enclosure and temperature control panel where required to inhibit condensation.

C. All line voltage and low voltage wiring and conduit associated with the Temperature Control System are included in this Section. Wiring and conduit shall comply with Division 26.

3.5 PIPING SYSTEM REQUIREMENTS

A. Drawing plans, schematic 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.

3.6 PRIMING AND PAINTING

A. Perform priming and painting on the equipment and materials as specified herein.

B. See Division 09 Painting Section(s) for detailed requirements.

C. Priming and Painting:
1. Exposed ferrous metals, including piping, which are not galvanized or factory-finished shall be primed and painted.
a. Black Steel Piping:
1) Primer: One coat gray Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, comparable products by Rust-Oleum, Kelly Moore, or equal.
2) Topcoat: Two coats gray Sherwin-Williams Pro Industrial Waterbased Alkyd Urethane Enamel, comparable products by Rust-Oleum, Kelly Moore, or equal.
2. Metal surfaces of items to be jacketed or insulated except piping shall be given two coats of primer unless furnished with equivalent factory finish. Items to be primed shall be properly cleaned by effective means free of rust, dirt, scale, grease and other deleterious matter and then primed with the best available grade of zinc rich primer. After erection or installation, all primed surfaces shall be properly cleaned of any foreign or deleterious matter that might impair proper bonding of subsequent paint coatings. Any abrasion or other damage to the shop or field prime coat shall be properly repaired and touched up with the same material used for the original priming.
3. Where equipment is provided with nameplate data, the nameplate shall be masked off prior to painting. When painting is completed, remove masking material.

3.7 PIPING SYSTEMS INSTALLATION

A. At time of final connection, and prior to opening valve to allow pressurization of water and gas piping from existing systems, on site or off site, perform a pressure test to indicate static pressure of existing systems. If pressure on water piping is greater than 80 psi, or gas pressure is not as indicated on Contract Documents, inform Architect immediately. Do not allow piping systems to be pressurized without written consent of the Architect.

B. General:
1. All piping shall be concealed unless shown or otherwise directed. Allow sufficient space for ceiling panel removal.
2. Installation of piping shall be made with appropriate fittings. Bending of piping will not be accepted.
3. Install piping to permit application of insulation and to allow valve servicing.
4. Where piping or conduit is left exposed within a room, the same shall be run true to plumb, horizontal, or intended planes. Where possible, uniform margins are to be maintained between parallel lines and/or adjacent wall, floor, or ceiling surfaces.
5. Horizontal runs of pipes and/or electrical conduit suspended from ceilings shall provide for a maximum headroom clearance. The clearance shall not be less than 6'-6" without written approval from the Architect.
6. Close ends of pipe immediately after installation. Leave closure in place until removal is necessary for completion of installation.
7. Each piping system shall be thoroughly flushed and proved clean before connection to equipment.
8. Pipe the discharge of each relief valve, air vent, backflow preventer, and similar device to floor sink or drain.
9. Install exposed polished or enameled connections with special care showing no tool marks or threads at fittings.
10. Install horizontal valves with valve stem above horizontal.
11. Use reducing fittings; bushings shall not be allowed. Use eccentric reducing fittings wherever necessary to provide free drainage of lines and passage of air.
12. Verify final equipment locations for roughing-in.

13. Service Markers: Mark the location of each plugged or capped pipe with a 4 inch round by 30 inch long concrete marker, set flush with finish grade. Provide 2-1/2 inch diameter engraved brass plate as part of monument marker.
14. Furnish and install anchors or thrust blocks on PVC water lines in the ground, at all changes in direction of piping, and at all connections or branches from mains 1-1/2 inch and larger. Form anchors or thrust blocks by pouring concrete between pipe and trench wall. Thrust blocks shall be of adequate size and so placed as to take thrusts created by maximum internal water pressure. Sizing and placement shall be per manufacturer's recommendations, CPC, and IAPMO installation standards. Anchor piping to building construction.
15. Sanitary Sewer and Storm Drain: Grade piping inside building uniformly 1/4 inch per foot if possible but not less than 1/8 inch per foot. Run piping as straight as possible. Make piping connections between building piping and outside service pipe with cast iron reducers or increasers. Slope sewers uniformly between given elevations where invert elevations are shown.
16. Where piping is installed in walls within one inch of the face of stud, provide a 16 gauge sheet metal shield plate on the face of the stud. The shield plate shall extend a minimum of 1-1/2 inches beyond the outside diameter of the pipe.

C. Sleeves:
1. Install Adjus-to-Crete, Pipeline Seal and Insulator, or equal, pipe sleeves of sufficient size to allow for free motion of pipe, 24 gauge galvanized steel. The space between pipe and sleeves through floor slabs on ground, through outside walls above or below grade, through roof, and other locations as directed shall be caulked with oakum and mastic and made watertight. The space between pipe and sleeve and between sleeve and slab or wall shall be sealed watertight.
2. At Contractor's option, Link-Seal, Metraflex Metraseal, or equal, casing seals may be used in lieu of caulking. Wrap pipes through slabs on grade with 1 inch thick fiberglass insulation to completely isolate the pipe from the concrete.

D. Floor, Wall, and Ceiling Plates:
1. Fit all pipes with or without insulation passing through walls, floors, or ceilings, and all hanger rods penetrating finished ceilings with chrome-plated or stainless escutcheon plates.

E. Firestopping:
1. Pack the annular space between the pipe sleeves and the pipe through all floors and walls with UL listed fire stop, and sealed at the ends. All pipe penetrations shall be UL listed, Hilti, 3M Pro-Set, or equal.
    a. Install fire caulking behind mechanical services installed within fire rated walls, to maintain continuous rating of wall construction.
2. Provide SpecSeal Systems UL fire rated sleeve/coupling penetrators for each pipe penetration or fixture opening passing through floors, walls, partitions or floor/ceiling assemblies. All Penetrators shall comply with UL Fire Resistance Directory (Latest Edition), and in accordance with Chapter 7, CBC requirements.
3. Sleeve penetrators shall have a built in anchor ring for waterproofing and anchoring into concrete pours or use the special fit cored hole penetrator for cored holes.
4. Copper and steel piping shall have SpecSeal plugs on both sides of the penetrator to reduce noise and to provide waterproofing.
5. All above Systems to be installed in strict accordance with manufacturer's instructions.
6. Alternate firestopping systems are acceptable if approved equal. However, any deviation from the above specification requires the Contractor to be responsible for determining the suitability of the proposed products and their intended use, and the Contractor shall assume all risks and liabilities whatsoever in connection therewith.

F. Flashing:

1. Flashing for penetrations of metal or membrane roof for mechanical items such as flues and pipes shall be coordinated with the roofing manufacturer and roofing installer for the specific roofing type. The work of this section shall include furnishing, layout, sizing, and coordination of penetrations required for the mechanical work.
    a. Furnish and install flashing and counterflashing in strict conformance with the requirements of the roofing manufacturer. Submit shop drawing details for review prior to installation.
    b. Furnish and install counterflashing above each flashing required. Provide Stoneman, or equal, vandalproof top and flashing combination. Provide vandalproof top for each plumbing vent through roof. Elmdor/Stoneman Model 1540, 1550, 1570, or equal.
2. For all other types of roofing system, furnish and install around each pipe, where it passes through roof, a flashing and counterflashing. All flashing shall be made of four pound seamless sheet lead with 6 inch minimum skirt and steel reinforced boot. Counterflashing shall be cast iron. For vents, provide vandalproof top and flashing combination. Elmdor/Stoneman Model 1100-4, 1100-5, 1100-7, or equal.

G. Hangers and Supports:
1. General: Support equipment and piping so that it is firmly held in place by approved iron hangers and supports and special hangers. Hanger and support components shall support weight of equipment and pipe, fluid, and pipe insulation based on spacing between supports with minimum factor of safety of five based on ultimate strength of material used. Do not exceed manufacturer's load rating. Pipe attachments or hangers, of same size as pipe or tubing on which used, or nearest available. Rigidly fasten hose faucets, fixture stops, compressed air outlets, and similar items to the building construction. The Architect shall approve hanger material before installation. Do not support piping with plumbers' tape, wire rope, wood, or other makeshift devices. Where building structural members do not match piping support spacing, provide “bridging” support members firmly attached to building structural members in a fashion approved by the structural engineer.
    a. Materials, design, and type numbers per Manufacturers' Standardization Society (MSS), Standard Practice (SP)-58.
        1) Provide copper-plated or felt-lined hangers for use on copper tubing.
2. Hanger components shall be provided by one manufacturer: B-Line, Grinnell, Unistrut, Badger, or equal.
3. Riser clamps: B-line model B3373, or equal.
4. Pipe Hanger and Support Placement and Spacing:
    a. Vertical piping support spacing: Provide riser clamps for piping, above each floor, in contact with the floor. Provide support at joints, branches, and horizontal offsets. Provide additional support for vertical piping, spaced at or within the following maximum limits:

Pipe Diameter	Steel Threaded or Welded (Note 3)	Steel Gas	Copper Brazed or Soldered (Note 3)	CPVC & PVC (Note 2)
1/2 - 1”	12 ft.	6 ft.	Each Floor, Not to Exceed 10 ft.	Base and Each Floor (Note 1)
1-1/4 - 2”	12 ft.	Each Floor, Not to Exceed 10 ft.	Each Floor, Not to Exceed 10 ft..	Base and Each Floor (Note 1)
2-1/2 - 3”	12 ft.	Each Floor, Not to Exceed 10 ft.	Each Floor, Not to Exceed 10 ft.	Base and Each Floor (Note 1)
Over 4”	12 ft.	Each Floor, Not to Exceed 10 ft.	Each Floor, Not to Exceed 10 ft.	Base and Each Floor (Note 1)

1) Note 1: Provide mid-story guides.
2) Note 2: For PVC piping, provide for expansion every 30 feet per IAPMO installation standard. For CPVC piping, provide for expansion per IAPMO installation standard.
3) Note 3: Spacing of hangers and supports for piping assembled with mechanical joints shall be in accordance with standards acceptable to authorities having jurisdiction.

b. Vertical cast iron piping support spacing: Base and each floor not to exceed 15 feet.
c. Horizontal piping, hanger and support spacing: Locate hangers and supports at each change of direction, within one foot of elbow, and spaced at or within following maximum limits:

Pipe Diameter	Steel Threaded or Welded (Note 2)	Steel Gas	Copper Brazed or Soldered (Notes 2, 3)	CPVC & PVC (Note 1)
1/2 - 1"	6 ft.	6 ft.	5 ft.	3 ft.
1-1/4 - 2"	7 ft.	10 ft.	6 ft.	4 ft.
2-1/2 - 3"	10 ft.	10 ft.	10 ft.	4 ft.
Over 4"	10 ft.	10 ft.	10 ft.	4 ft.

1) Note 1: For PVC piping, provide for expansion every 30 feet per IAPMO installation standard. For CPVC piping, provide for expansion per IAPMO installation standard.
2) Note 2: Spacing of hangers and supports for piping assembled with mechanical joints shall be in accordance with standards acceptable to authorities having jurisdiction.
3) Note 3: Includes all refrigerant piping, including vapor and hot gas pipes.

d. Horizontal cast iron piping support spacing:
   1) Support piping at every other joint for piping length of less than 4 feet.
   2) For piping longer than 4 feet, provide support on each side of the coupling, within 18 inches of each joint.
   3) Hanger shall not be installed on the coupling.
   4) Provide support at each horizontal branch connection.
   5) Provide sway brace at 40 foot maximum spacing for suspended pipe with no-hub joints, except where a lesser spacing is required by the seismic design criteria used in delegated design for seismic systems. Refer to Article, Submittals.
   6) Provide a brace on each side of a change in direction of 90 degrees or more.

5. Suspended Piping:
   a. Individually suspended piping: B-Line B3690 J-Hanger or B3100 Clevis, complete with threaded rod, or equal. All hangers on supply and return piping handling heating hot water or steam shall have a swing connector at point of support.

Pipe Size	Rod Size Diameter
2" and Smaller	3/8"
2-1/2" to 3-1/2"	1/2"
4" to 5"	5/8"
6"	3/4"

   b. Trapeze Suspension: B-Line 1-5/8 inch width channel in accordance with manufacturer's published load ratings. No deflection to exceed 1/180 of a span.
   c. Trapeze Supporting Rods: Shall have a safety factor of five; securely anchor to building structure.
   d. Pipe Clamps and Straps: B-Line B2000, B2400; isolate copper pipe with two thicknesses of 2 inches wide 10-mil polyvinyl tape. Where used for seismic support systems, provide B-Line B2400 series pipe straps.
6. Support to Structure:
7. Rubber Neoprene Pipe Isolators:
   a. Pipe isolators shall comprise an internal rubber or neoprene material that isolates pipe from hanger and structure. Install at all piping located in acoustical walls. Refer to Architectural Drawings for location of acoustical walls.
   b. Isolation material shall be either a rubber or neoprene material that prevents contact between the pipe and the structure. The rubber shall have between a 45 to 55 durometer rating and a minimum thickness of 1/2 inch.
   c. Acceptable Suppliers:
      1) Vertical runs: Acousto-Plumb or equal.
      2) Horizontal runs: B-Line, Vibraclamp; Acousto-Plumb or equal.
8. Provide support for piping through roof, arranged to anchor piping solidly in place at the roof penetration.
9. Provide rigid insulation and a 12 inch long, 18 gauge galvanized sheet iron shield between the covering and the hanger whenever hangers are installed on the outside of the pipe covering.
10. Insulate copper tubing from ferrous materials and hangers with two thicknesses of 3 inch wide, 10 mil polyvinyl tape wrapped around pipe.
11. Provide a support or hanger close to each change of direction of pipe either horizontal or vertical and as near as possible to concentrated loads.

12. Suspend rods from concrete inserts with removable nuts where suspended from concrete decks. Power actuated inserts will not be allowed.

3.8 UNION AND FLANGE INSTALLATION

A. Install Watts, Epco, Nibco, or equal, dielectric unions or flanges at points of connection between copper or brass piping or material and steel or cast iron pipe or material except in drain, waste, vent, or rainwater piping. Bushings or couplings shall not be used. Dielectric unions installed in potable water systems shall conform to the lead-free requirements of the California Health and Safety Code Section 116875.

B. Install unions in piping NPS 2” and smaller, and flanges in piping NPS 2-1/2” and larger whether shown or not at each connection to all equipment and tanks, and at all connections to all automatic valves, such as temperature control valves. Unions installed in potable water systems shall conform to the lead-free requirements of the California Health and Safety Code Section 116875.

C. Locate the unions for easy removal of the equipment, tank, or valve.

3.9 CONCRETE WORK

A. Concrete work required for work of this Section shall be included under another section of the Specification, unless otherwise noted, including poured-in-place concrete work for installing precast manholes, catch basins, etc., and shall include reinforced concrete bases for pumps, tanks, compressors, fan units, boilers, unless the work is specifically indicated on the Drawings to be furnished under this Section.

B. Thrust blocks, underground anchors, and pads for cleanouts, valve access boxes and washer boxes are included under this Section of the Specification. Concrete shall be 3000 psi test minimum. Refer to Division 03 for concrete types.

3.10 EXPANSION ANCHORS IN HARDENED CONCRETE

3.11 PIPING SYSTEM PRESSURE TESTING

A. General:
1. Perform operational tests under simulated or actual service conditions, including one test of complete plumbing installation with fixtures and other appliances connected.
2. Repair leaks and defects with new materials, and retest piping or portion thereof until satisfactory results are obtained.

B. Piping Systems: Test piping systems in accordance with the following requirements and applicable codes:
1. Authority having jurisdiction shall witness tests of piping systems.
2. Notify Architect at least seven days in advance of testing.
3. All piping shall be tested at completion of roughing-in, or at other times as directed by Architect.
4. Furnish necessary materials, test pumps, gases, instruments and labor required for testing.
5. Isolate from system equipment that may be damaged by test pressure.

C. Test Schedule: No loss in pressure or visible leaks shall show after four hours at the pressures indicated.

D. Testing of Sanitary Sewer, Drain, Vent, and Storm Drain may be done in segments in order to limit pressure to within manufacturer's recommendations. Test to 10 feet above highest point in the system.

System Tested	Test Pressure PSI	Test With
Sanitary Sewer, Drain, Vent	10 Ft. Hd.	Water
Storm Drain, Condensate Drains	10 Ft. Hd.	Water
Domestic Water	125	Water
Natural Gas (PE)	60	Air & Non-corrosive Leak Test Fluid
Natural Gas (Steel)	100	Air & Non-corrosive Leak Test Fluid
Compressed Air	200 lb.	Air & Non-corrosive Leak Test Fluid
Deionized Water	50	Water

1. Flush deionized water lines with deionized water after test and approval.
2. Non-corrosive leak test fluid shall be suitable for use with piping material specified, and with the type of gas conveyed by the piping system.

3.12 OPERATION OF SYSTEMS

A. Do not operate any plumbing equipment for any purpose, temporary or permanent, until all of the following has been completed:
   1. Complete all requirements listed under "Check, Test and Start Requirements."
   2. Piping has been properly cleaned. Piping systems shall be flushed and treated prior to operation.
   3. Filters, strainers etc. are in place.
   4. Bearings have been lubricated, and alignment of rotating equipment has been checked.
   5. Equipment has been run under observation, and is operating in a satisfactory manner.

B. Provide test and balance agency with one set of Contract Drawings, Specifications, Addenda, Change orders issued, applicable shop drawings and submittals and temperature control drawings.

3.13 CHECK, TEST AND START REQUIREMENTS

A. An authorized representative of the equipment manufacturer shall perform check, test and start of each piece of plumbing equipment. The representative may be an employee of the equipment manufacturer, or a manufacturer-certified contractor. Submit written certification from the manufacturer stating that the representative is qualified to perform the check test and start of the equipment.
   1. As part of the submittal process, provide a copy of each manufacturer's printed startup form to be used.

2. Some items of specified equipment may require that check, test and start of equipment must be performed by the manufacturer, using manufacturer's employees. See specific equipment Articles in these Specifications for this requirement.
3. Provide all personnel, test instruments, and equipment to properly perform the check, test and start work.
4. When work has been completed, provide copies of reports for review, prior to final observation of work.

B. Provide copies of the completed check, test and start report of each item of equipment, bound with the Operation and Maintenance Manual.

C. Upon completion of the work, provide a schedule of planned maintenance for each piece of equipment. Indicate frequency of service, recommended spare parts (including filters and lubricants), and methods for adjustment and alignment of all equipment components. Provide a copy of the schedule with each operating and maintenance manual. Provide a copy of certification from the Owner's representative indicating that they have been properly instructed in maintenance requirements for the equipment installed.

3.14 DEMONSTRATION AND TRAINING

A. An authorized representative of the equipment manufacturer shall train Owner-designated personnel in maintenance and adjustment of equipment. The representative may be an employee of the equipment manufacturer, or a manufacturer-certified contractor. Submit written certification from the manufacturer stating that the representative is qualified to perform the Owner training for the equipment installed.
1. As part of the submittal process, provide a training agenda outlining major topics and time allowed for each topic.
2. Some items of specified equipment require that training must be performed by the manufacturer, using manufacturer's employees. See specific equipment Articles in these Specifications for this requirement.
3. Contractor shall provide three copies of certification by Contractor that training has been completed, signed by Owner's representative, for inclusion in Operation and Maintenance Manual. Certificates shall include:
    a. Listing of Owner-designated personnel completing training, by name and title.
    b. Name and title of training instructor.
    c. Date(s) of training.
    d. List of topics covered in training sessions.
4. Refer to specific equipment Articles for minimum training period duration for each piece of equipment.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Electric motors.
2. Motor starters.
3. Gauges.
4. Thermometers.

1.2 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract apply to this Section.

B. This Section is a part of each Division 23 Section.

1.3 ADDITIONAL REQUIREMENTS

A. Furnish and install incidental work not shown or specified necessary to provide a complete and workable system.

B. Make all temporary connections required to maintain services, including adequate heat and cooling, during the course of the Contract without additional cost to Owner. Notify Owner seven days in advance before disrupting services.

C. Provide for adjustments or modifications to fan and motor sheaves, belts, damper linkages, and other components as required to achieve specified air balance at no additional cost to Owner.

1.4 REFERENCES AND STANDARDS

A. Where material or equipment is specified to conform to referenced standards, it shall be assumed that the most recent edition of the standard in effect at the time of bid shall be used.
1. AABC - Associated Air Balance Council
2. AFBMA - Anti Friction Bearing Manufacturer's Association
3. AMCA - Air Moving and Control Association Inc.
    a. Standard 210 - Laboratory Methods of Testing Fans
4. ANSI - American National Standards Institute
5. ARI - Air-Conditioning and Refrigeration Institute
6. ASHRAE - American Society of Heating, Refrigerating and Air Conditioning Engineers
7. ASME - American Society of Mechanical Engineers
8. ASTM - American Society for Testing and Materials
9. CCR - California Code of Regulations
    a. Title 8 - Division of Industrial Safety, Subchapter 7; General Industry Safety Orders, Articles 31 through 36
10. CSA – Canadian Standards Association International
11. CSFM - California State Fire Marshal
12. NCPWB - National Certified Pipe Welding Bureau
13. NIST - National Institute of Standards and Technology
14. NEMA - National Electrical Manufacturers' Association
15. NFPA - National Fire Protection Association
16. OSHA - Occupational Safety and Health Act

17. SMACNA - Duct Manuals
18. UL - Underwriters' Laboratories, Inc.

B. Requirements of Regulatory Agencies:
   1. The publications listed below form part of this specification; comply with provisions of these publications except as otherwise shown or specified.
      a. California Building Code, 2019.
      b. California Electrical Code, 2019.
      c. California Energy Code, 2019.
      d. California Fire Code, 2019.
      e. California Mechanical Code, 2019.
      f. California Plumbing Code, 2019.
      g. California Code of Regulations, Title 24.
      h. California Health and Safety Code.
      i. CAL-OSHA.
      j. California State Fire Marshal, Title 19 CCR.
      k. National Fire Protection Association.
      l. Occupational Safety and Health Administration.
      m. Other applicable state laws.
   2. Nothing in Drawings or specifications shall be construed to permit work not conforming to these codes, or to requirements of authorities having jurisdiction. It is not the intent of Drawings or specifications to repeat requirements of codes except where necessary for clarity.

1.5 DRAWINGS

A. Examine Drawings prior to bidding of work and report discrepancies in writing to Architect.

B. Drawings showing location of equipment and materials are diagrammatic and job conditions will not always permit installation in location shown. The HVAC Drawings show general arrangement of equipment and materials, etc., and shall be followed as closely as existing conditions, actual building construction, and work of other trades permit.
   1. Architectural and Structural Drawings shall be considered part of the Work. These Drawings furnish Contractor with information relating to design and construction of the Project. Architectural Drawings take precedence over HVAC Drawings.
   2. Because of the small scale of HVAC Drawings, not all offsets, fittings, and accessories required are shown. Investigate structural and finish conditions affecting the Work and arrange Work accordingly. Provide offsets, fittings, and accessories required to meet conditions. Inform Architect immediately when job conditions do not permit installation of equipment and materials in the locations shown. Obtain the Architects approval prior to relocation of equipment and materials.
   3. Relocate equipment and materials installed without prior approval of the Architect. Remove and relocate equipment and materials at Contactors’ expense upon Architects’ direction.
   4. Minor changes in locations of equipment, piping, ducts, etc., from locations shown shall be made when directed by the Architect at no additional cost to the Owner providing such change is ordered before such items of work, or work directly connected to same are installed and providing no additional material is required.

C. Execute work mentioned in the Specifications and not shown on the Drawings, or vice versa, the same as if specifically mentioned or shown in both.

1.6 FEES AND PERMITS

A. Obtain and pay for permits and service required in installation of the Work. Arrange for required inspections and secure approvals from authorities having jurisdiction. Comply with requirements of Division 01.

B. Arrange for utility connections and pay charges incurred, including excess service charges.

C. Coordination:
   1. General:
      a. Coordinate HVAC Work with trades covered in other Specifications Sections to provide a complete, operable and sanitary installation of the highest quality workmanship.
   2. Electrical Coordination:
      a. Refer to the Electrical Drawings and Specifications, Division 26, for service voltage and power feed wiring for equipment specified under this section. Contractor has full responsibility for the following items of work:
         1) Review the Electrical Drawings and Division 26 Specifications to verify that electrical services provided are adequate and compatible with equipment requirements.
         2) If additional electrical services are required above that indicated on Electrical Drawings and in Division 26, such as more control interlock conductors, larger feeder, or separate 120 volt control power source, include cost to furnish and install additional electrical services as part of the bid.
         3) Prior to proceeding with installation of additional electrical work, submit detailed drawings indicating exact scope of additional electrical work.
   3. Mechanical Coordination:
      a. Arrange for pipe spaces, chases, slots and openings in building structure during progress of construction, to accommodate mechanical system installation.
      b. Coordinate installation of supporting devices. Set sleeves in poured-in-place concrete and other structural components during construction.
      c. Coordinate requirements for access panels and doors for mechanical items requiring access where concealed behind finished surfaces. Access panels and doors are specified in Division 08 Section “Access Doors and Frames.”
      d. Coordinate with other trades equipment locations, pipe, duct and conduit runs, electrical outlets and fixtures, air inlets and outlets, and structural and architectural features. Provide information on location of piping and seismic bracing to other trades as required for a completely coordinated project.

1.7 SUBMITTALS - GENERAL

A. Refer to Division 01 Submittals Section(s) for additional requirements.

B. Submittal packages may be submitted via email as PDF electronic files, or as printed packages. PDFs shall be legible at actual size (100 percent). Provide seven copies of printed submittal packages.

C. Provide submittal of materials proposed for use as part of this Project. Product names in Specifications and on Drawings are used as standards of quality. Furnish standard items on specified equipment at no extra cost to the Contract regardless of disposition of submittal data. Other materials or methods shall not be used unless approved in writing by Architect. Architect's review will be required even though "or equal" or synonymous terms are used.
   1. Partial or incomplete submittals will not be considered.
   2. Quantities are Contractor's responsibility and will not be reviewed.

3. Provide materials of the same brand or manufacturer for each class of equipment or material.
4. Identify each item by manufacturer, brand, trade name, number, size, rating, or other data necessary to properly identify and review materials and equipment. Words "as specified" are not sufficient identification.
5. Identify each submittal item by reference to items' Specification Section number and paragraph, by Drawing and detail number, and by unit tag number.
6. Organize submittals in same sequence as in Specification Sections.
7. Show physical arrangement, construction details, finishes, materials used in fabrications, provisions for piping entrance, access requirements for installation and maintenance, physical size, mechanical characteristics, foundation and support details, and weight.
    a. Submit Shop Drawings, performance curves, and other pertinent data, showing size and capacity of proposed materials.
    b. Specifically indicate, by drawn detail or note, that equipment complies with each specifically stated requirement of Contract Documents.
    c. Drawings shall be drawn to scale and dimensioned (except schematic diagrams). Drawings may be prepared by vendor but must be submitted as instruments of Contractor, thoroughly checked and signed by Contractor before submission to Architect for review.
    d. Catalog cuts and published material may be included with supplemental scaled drawings.

D. Review of submittals will be only for general conformance with design concept and general compliance with information given in Contract Documents. Review will not include quantities, dimensions, weights or gauges, fabrication processes, construction methods, coordination with work of other trades, or construction safety precautions, which are sole responsibility of Contractor. Review of a component of an assembly does not indicate acceptance of an assembly. Deviations from Contract Documents not clearly identified by Contractor are Contractor's responsibility and will not be reviewed by Architect.

E. Within reasonable time after award of contract and in ample time to avoid delay of construction, submit to Architect shop drawings or submittals on all items of equipment and materials provided. Provide submittal as a complete package.
    1. Shop drawings and submittals shall include Specification Section, Paragraph number, and Drawing unit symbol or detail number for reference. Organize submittals into booklets for each Specification section and submit in loose-leaf binders with index. Deviations from the Contract Documents shall be prominently displayed in the front of the submittal package and referenced to the applicable Contract requirement.

F. Furnish to the Project Inspector complete installation instructions on material and equipment before starting installation.

1.8 ACTION SUBMITTALS

A. Product Data: Submit manufacturer's technical product data and installation instructions for plumbing systems materials and products.

B. Shop Drawings.

C. Sustainable Design Submittals:
    1. Product Data: For adhesives and sealants, documentation of compliance including printed statement of VOC content and chemical components.
    2. Laboratory Test Reports: For adhesives and sealants, indicating compliance with requirements for low-emitting materials.

D. Delegated-Design Submittals: For seismic supports, anchorages, restraints, and vibration isolators indicated to comply with performance requirements and design criteria.
   1. Calculations performed for use in selection of seismic supports, anchorages, restraints, and vibration isolators shall utilize criteria indicated in Structural Contract Documents.
   2. Include design calculations and details for selecting vibration isolators and vibration isolation bases complying with performance requirements, design criteria, and analysis data signed and sealed by the California registered structural engineer responsible for their preparation.
   3. Supports, anchorage and restraints for piping, ductwork, and equipment shall be an HCAI pre-approved system such as TOLCO, ISAT, Mason, or equal. Pipes, ducts and equipment shall be seismically restrained in accordance with requirements of current edition of California Building Code. System shall have current OPM number and shall meet additional requirements of authority having jurisdiction. Provide supporting documentation required by the reviewing authority and the Architect and Engineer. Provide layout drawings showing piping, ductwork and restraint locations.
      a. Bracing of Piping, Ductwork, and Equipment: Specifically state how bracing attachment to structure is accomplished. Provide shop drawings indicating seismic restraints, including details of anchorage to building. In-line equipment must be braced independently of piping and ductwork, and in conformance with applicable building codes. Provide calculations to show that pre-approval numbers have been correctly applied in accordance with general information notes of pre-approval documentation.
      b. In lieu of the above or for non-standard installations not covered in the above pre-approved systems, Contractor shall provide layout drawings showing piping, ductwork, and restraint locations, and detail supports, attachments and restraints, and furnish supporting calculations and legible details sealed by a California registered structural engineer, in accordance with California Building Code
   4. Additional Requirements: In addition to the above, conform to all state and local requirements.

1.9 INFORMATIONAL SUBMITTALS

A. Provide coordinated layouts for HVAC Ductwork systems, in accordance with Specification Section 238000.

B. Check, Test, and Start forms, from equipment manufacturers.

C. Check, Test and Start reports.

1.10 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data:
   1. Furnish three complete sets of Operation and Maintenance Manual bound in hardboard binder, and one compact disc containing complete Operation and Maintenance Manual in searchable PDF format. Provide Table of Contents. Provide index tabs for each piece of equipment in binder and disc. Begin compiling data upon approval of submittals.
      a. Sets shall incorporate the following:
         1) Product Data.
         2) Shop Drawings.
         3) Record Drawings.
         4) Service telephone number, address and contact person for each category of equipment or system.
         5) Complete operating instructions for each item of heating, ventilating and air conditioning equipment.
         6) Copies of guarantees/warrantees for each item of equipment or systems.

7) Test data and system balancing reports.
8) Typewritten maintenance instructions for each item of equipment listing lubricants to be used, frequency of lubrication, inspections required, adjustment, etc.
9) Manufacturers' bulletins with parts numbers, instructions, etc., for each item of equipment.
10) Temperature control diagrams and literature.
11) Check test and start reports for each piece of mechanical equipment provided as part of the Work.
12) Commissioning and Preliminary Operation Tests required as part of the Work.

2. Post service telephone numbers and addresses in an appropriate place designated by Architect.

B. Record Drawings:
1. Refer to Division 01 for additional requirements.
2. Upon completion of the Work, deliver to Architect the following:
a. Originals of drawings showing the Work exactly as installed.
b. One complete set of reproducible drawings showing the Work exactly as installed.
c. One compact disc with complete set of drawings in PDF format showing the Work exactly as installed.
d. Provide Contractor’s signature, verifying accuracy of record drawings.
e. Obtain the signature of the Inspector of Record for Record Drawings.

1.11 SUBSTITUTIONS

A. Refer to Division 01 for complete instructions. Requirements given below are in addition to or are intended to amplify Division 01 requirements. In case of conflict between requirements given herein and those of Division 01, Division 01 requirements shall apply.

B. It is the responsibility of Contractor to assume costs incurred because of additional work and or changes required to incorporate proposed substitute into the Project. Refer to Division 01 for complete instructions.

C. Substitutions will be interpreted to be manufacturers other than those specifically listed in the Contract Documents by brand name, model, or catalog number.

D. Only one request for substitution will be considered for each item of equipment or material.

E. Substitution requests shall include the following:
1. Reason for substitution request.
2. Complete submittal information as described herein; see “Submittals.”
3. Coordinated scale layout drawings depicting position of substituted equipment in relation to other work, with required clearances for operation, maintenance and replacement.
4. List optional features required for substituted equipment to meet functional requirements of the system as indicated in Contract Documents.
5. Explanation of impact on connected utilities.
6. Explanation of impact on structural supports.

F. Installation of reviewed substitution is Contractors’ responsibility. Any mechanical, electrical, structural, or other changes required for installation of substituted equipment or material must be made by Contractor without additional cost to Owner. Review by Architect of substituted equipment or material, will not waive these requirements.

G. Contractor may be required to compensate Architect for costs related to substituted equipment or material.

1.12 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of HVAC systems products, of types, materials, and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years.

B. Contractor's Qualifications: Firm with at least 5 years of successful installation experience on projects with HVAC systems work similar to that required for this Project.

C. Comply with applicable portions of California Mechanical Code pertaining to selection and installation of HVAC materials and products.

D. All materials and products shall be new.

1.13 DELIVERY, STORAGE, AND HANDLING

A. Protect equipment and materials delivered to Project site from weather, humidity and temperature variations, dirt, dust and other contaminants.

1.14 FIELD CONDITIONS

A. Contractor shall visit Project site and examine existing conditions in order to become familiar with Project scope. Verify dimensions shown on Drawings at Project site. Bring discrepancies to the attention of Architect. Failure to examine Project site shall not constitute basis for claims for additional work because of lack of knowledge or location of hidden conditions that affect Project scope.

B. Information on Drawings relative to existing conditions is approximate. Deviations from Drawings necessary during progress of construction to conform to actual conditions shall be approved by the Architect and shall be made without additional cost to the Owner. The Contractor shall be held responsible for damage caused to existing services. Promptly notify the Architect if services are found which are not shown on Drawings.

1.15 WARRANTY

A. Refer to Division 01 for warranty requirements, and duration and effective date of Contractor’s Standard Guarantee.

B. Repair or replace defective work, material, or part that appears within the warranty period, including damage caused by leaks.

C. On failure to comply with warranty requirements within a reasonable length of time after notification is given, Architect/Owner shall have repairs made at Contractor's expense.

PART 2 - PRODUCTS

2.1 GENERAL

A. Materials or equipment of the same type shall be of the same brand wherever possible. All materials shall be new and in first class condition.

B. All sizes, capacities, and efficiency ratings shown are minimum, except that gas capacity is maximum available.

C. Refer to Division 221000 and 238000 for specific system piping materials.

2.2 MATERIALS

A. No material installed as part of this Work shall contain asbestos.

B. California Green Building Code Compliance:
1. HVAC and refrigeration equipment shall not contain CFCs.
2. HVAC and refrigeration equipment shall not contain Halons.

2.3 ELECTRIC MOTORS

A. General Motor Requirements: Comply with NEMA MG 1 unless otherwise indicated. Comply with IEEE 841 for severe-duty motors.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or equal:
a. U.S. Motors.
b. Century Electric.
c. General Electric.
d. Lincoln.
e. Gould.

B. Motor Characteristics: Designed for continuous duty at ambient temperature of 40 deg. C and at altitude of 3300 feet above sea level. Capacity and torque shall be sufficient to start, accelerate, and operate connected loads at designated speeds, at installed altitude and environment, with indicated operating sequence, and without exceeding nameplate ratings or considering service factor.
1. Motors exceeding the nameplate amperage shall be promptly replaced at no cost to the Owner. Horsepower shown is minimum and shall be increased as necessary to comply with above requirements. Furnish motors with splash-proof or weatherproof housings, where required or recommended by the manufacturer. Match the nameplate voltage rating with the electrical service supplied. Check Electrical Drawings. Provide a transformer for each motor not wound specifically for system voltage.

C. Polyphase Motors: NEMA MG 1, Design B, medium induction motor, premium efficiency as defined in NEMA MG 1. Select motors with service factor of 1.15. Provide motor with random-wound, squirrel cage rotor, and permanently lubricated or regreasable, shielded, antifriction ball bearings suitable for radial and thrust loading. Temperature rise shall match insulation rating. Provide Class F insulation.
1. Multispeed motors shall have separate windings for each speed.

D. Polyphase Motors with Additional Requirements:
1. Motors Used with Reduced-Voltage and Multispeed Controllers: Match wiring connection requirements for controller with required motor leads. Provide terminals in motor terminal box, suited to control method.
2. Motors Used with Variable Frequency Controllers:
a. Separately Connected Motors: Ratings, characteristics, and features coordinated with and approved by controller manufacturer.
b. Windings: Copper magnet wire with moisture-resistant insulation varnish, designed and tested to resist transient spikes, high frequencies, and short time rise pulses produced by pulse-width modulated inverters.

c. Premium-Efficient Motors: Class B temperature rise; Class F insulation.
d. Inverter-Duty Motors: Class F temperature rise; Class H insulation.
e. Thermal Protection: Comply with NEMA MG 1 requirements for thermally protected motors.
f. Each motor shall be provided with a shaft grounding device for stray current protection.

3. Severe-Duty Motors: Comply with IEEE 841, with 1.15 minimum service factor.

E. Single-Phase Motors:
1. Select motors with service factor of 1.15.
2. Motors larger than 1/20 hp shall be one of the following, to suit starting torque and requirements of specific motor application:
a. Permanent-split capacitor.
b. Split phase.
c. Capacitor start, inductor run.
d. Capacitor start, capacitor run.
3. Motors for HVAC exhaust, transfer, and supply fans larger than 1/12 hp and smaller than 1 hp shall be the following:
a. Electronically Commutated motor (EC type): Motor shall be electronically commutated type specifically designed for applications, with heavy duty ball bearings. The motor shall be speed controllable down to 20% of full speed and 85% efficient at all speeds.
1) Exceptions:
a) Motors in fan-coils and terminal units that operate only when providing heating to the space served.
b) Motors installed in space conditioning equipment certified under California Energy Code Section 110.1 or 110.2.
4. Contractor's Option: Motors scheduled on Drawings as single-phase, and larger than 1/12 hp and smaller than 1 hp, for applications other than HVAC fans, may be EC type.
5. Multispeed Motors: Variable-torque, permanent-split-capacitor type.
6. Bearings: Prelubricated, antifriction ball bearings or sleeve bearings suitable for radial and thrust loading.
7. Motors 1/20 HP and Smaller: Shaded-pole type.
8. Thermal Protection: Internal protection to automatically open power supply circuit to motor when winding temperature exceeds a safe value calibrated to temperature rating of motor insulation. Thermal-protection device shall automatically reset when motor temperature returns to normal range.

2.4 MOTOR STARTERS

A. Square D, Allen Bradley, or equal, in NEMA Type 1 enclosure, unless otherwise specified or required. Minimum starter size shall be Size 1. Provide NEMA 3R enclosure where exposed to outdoors.

B. Provide magnetic motor starters for all equipment provided under the Mechanical Work. Starters shall be non-combination type. Provide part winding or reduced voltage start motors where shown or as hereinafter specified. Minimum size starter shall be Size 1.
1. All starters shall have the following:
a. Cover mounted hand-off-automatic switch. Starters installed exposed in occupied spaces shall have key operated HOA switch.
b. Ambient compensated thermal overload.
c. Fused control transformer (for 120 or 24 volt service).
d. Pilot lights, integral with the starters. Starters located outdoors shall be in NEMA IIIR enclosures.

2. Where three phase motors are provided for two-speed operation, provide two speed motor starters.
3. Starters for single-phase motors shall have thermal overloads. NEMA I enclosure for starters located indoors, NEMA IIIR enclosure for starters located outdoors.
4. Provide OSHA label indicating the device starts automatically.

2.5 GAUGES

A. Marsh "Series J", U.S. Gage, Danton 800, or equal, with bronze bushed movement and front recalibration. Dials shall be white with black numerals, 3-1/2 inch dial face. Normal reading shall be at mid-scale. Provide a needle valve on each gauge connection. Supply a gauge piped with branch isolation valves across the inlet and outlet of each pump and where shown on the Drawings.

B. Provide Pete's Plug II, Sisco P/T, or equal, test plug with Nordel core {and gasketed cap}, on inlet and outlet of each coil, boiler, condenser, chiller and heat exchanger and where shown on Drawings.

2.6 THERMOMETERS

A. Marsh, Taylor, Palmer, or equal, 5 inch diameter bimetal dial, adjustable from face, with adjustable positioner, located to be easily read from normal personnel approach. Normal reading shall be at mid-scale.
1. Provide extension for insulation.
2. Provide thermometers with steel bulb chambers and brass separable sockets.
3. Thermometers for air temperature shall have 8 inch minimum stem.

B. Provide Ventlock, Durodyne, or equal thermometer test holes at each air conditioning unit, furnace, and make-up air unit, in mixed air and supply air, and at all locations shown or scheduled on the Drawings. Provide two portable thermometers, with sensing connection arranged to suit test connections.

C. Provide Pete's Plug II, Sisco P/T, or equal, test plug with Nordel core, on inlet and outlet of each coil, boiler, condenser, chiller and heat exchanger and provide two digital electronic test thermometers for each range of fluid temperature and where shown on Drawings.

2.7 EQUIPMENT IDENTIFICATION

A. Identify each piece of equipment with a permanently attached engraved bakelite plate, 1/2 inch high white letters on black background.

2.8 PIPE IDENTIFICATION

A. Identify each piping system and indicate the direction of flow by means of Seton, Inc., Marking Services Inc., Reef Industries, Inc., or equal, pre-tensioned, coiled semi-rigid plastic pipe labels formed to circumference of pipe, requiring no fasteners or adhesive for attachment to pipe.

B. The legend and flow arrow shall conform to ASME A13.1.

PART 3 - EXECUTION

3.1 EXISTING MATERIALS:

A. Remove existing equipment, piping, wiring, construction, etc., which interferes with Work of this Contract. Promptly return to service upon completion of work in the area. Replace items damaged by Contractor with new material to match existing.

B. Removed materials which will not be re-installed and which are not claimed by Owner shall become the property of Contractor and shall be removed from the Project site. Consult Owner before removing any material from the Project site. Carefully remove materials claimed by Owner to prevent damage and deliver to Owner-designated storage location.

C. Existing piping and wiring not reused and are concealed in building construction may be abandoned in place and all ends shall be capped or plugged. Remove unused piping and wiring exposed in Equipment Rooms or occupied spaces. Material shall be removed from the premises. Disconnect power, water, gas, pump or any other active energy source from piping or electrical service prior to abandoning in place.

3.2 FRAMING, CUTTING, AND PATCHING

A. Special framing, recesses, chases and backing for Work of this Section, unless otherwise specified, are covered under other Specification Sections.

B. Contractor is responsible for placement of pipe sleeves, hangers, inserts, supports, and location of openings for the Work.

C. Cutting, patching, and repairing of existing construction to permit installation of equipment, and materials is the responsibility of Contractor. Repair or replace damage to existing work with skilled mechanics for each trade.

D. Cut existing concrete construction with a concrete saw. Do not utilize pneumatic devices.

E. Core openings through existing construction for passage of new piping and conduits. Cut holes of minimum diameter to suit size of pipe and associated insulation installed. Coordinate with building structure, and obtain Structural Engineer's approval prior to coring through existing construction.

3.3 MECHANICAL DEMOLITION

A. Refer to Division 01 Sections “Cutting and Patching” and “Selective Demolition” for general demolition requirements and procedures.

B. Disconnect, dismantle and remove mechanical systems, equipment, and components indicated to be removed. Coordinate with all other trades.
   1. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
   2. Piping to Be Abandoned in Place: Drain piping and cap or plug piping to remain with same or compatible piping material. Refrigerant system must be evacuated per EPA requirements.
   3. Ducts to Be Removed: Remove portion of ducts indicated to be removed and cap remaining ducts with same or compatible ductwork material.
   4. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material.

5. Equipment to Be Removed: Drain down and cap remaining services and remove equipment.
6. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
7. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.

C. If pipe, insulation, or equipment to remain is damaged in appearance or is unserviceable, remove damaged or unserviceable portions and replace with new products of equal capacity and quality.

3.4 ELECTRICAL REQUIREMENTS

A. Provide adequate working space around electrical equipment in compliance with the California Electrical Code. Coordinate the Mechanical Work with the Electrical Work to comply.

B. Furnish necessary control diagrams and instructions for the controls. Before permitting operation of any equipment which is furnished, installed, or modified under this Section, review all associated electrical work, including overload protection devices, and assume complete responsibility for the correctness of the electrical connections and protective devices. Motors and control equipment shall conform to the Standards of the National Electrical Manufacturers' Association. All equipment and connections exposed to the weather shall be NEMA IIIR with factory-wired strip heaters in each starter enclosure and temperature control panel where required to inhibit condensation.

C. All line voltage and low voltage wiring and conduit associated with the Temperature Control System are included in this Section. Wiring and conduit shall comply with Division 26.

3.5 PIPING SYSTEM REQUIREMENTS

A. Drawing plans, schematic 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.

3.6 PRIMING AND PAINTING

A. Perform priming and painting on the equipment and materials as specified herein.

B. See Division 09 Painting Section(s) for detailed requirements.

C. Priming and painting:
1. Exposed ferrous metals, including piping, which are not galvanized or factory-finished shall be primed and painted.
    a. Black Steel Piping:
        1) Primer: One coat gray Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, comparable products by Rust-Oleum, Kelly Moore, or equal.
        2) Topcoat: Two coats gray Sherwin-Williams Pro Industrial Waterbased Alkyd Urethane Enamel, comparable products by Rust-Oleum, Kelly Moore, or equal.
    b. Interior Ductwork: Refer to Division 09 Painting Section(s). Architect shall select paint color.
2. Metal surfaces of items to be jacketed or insulated except ductwork and piping shall be given two coats of primer unless furnished with equivalent factory finish. Items to be primed

shall be properly cleaned by effective means free of rust, dirt, scale, grease and other deleterious matter and then primed with the best available grade of zinc rich primer. After erection or installation, all primed surfaces shall be properly cleaned of any foreign or deleterious matter that might impair proper bonding of subsequent paint coatings. Any abrasion or other damage to the shop or field prime coat shall be properly repaired and touched up with the same material used for the original priming.

3. Where equipment is provided with nameplate data, the nameplate shall be masked off prior to painting. When painting is completed, remove masking material.

3.7 UNION AND FLANGE INSTALLATION

A. Install Epco, Nibco, or equal, dielectric unions or flanges at points of connection between copper or brass piping or material and steel or cast iron pipe or material except in drain piping. Bushings or couplings shall not be used.

B. Install unions in piping NPS 2” and smaller 3 or flanges in piping NPS 2-1/2” and larger whether shown or not at each connection to all equipment and tanks, and at all connections to all automatic valves, such as temperature control valves.

C. Locate the unions for easy removal of the equipment, tank, or valve.

D. Do not install unions or flanges in refrigerant piping systems.

3.8 CONCRETE WORK

A. Concrete work required for work of this Section shall be included under another section of the Specification, unless otherwise noted, including poured-in-place concrete work for installing precast manholes, catch basins, etc., and shall include reinforced concrete bases for pumps, tanks, compressors, fan units, boilers, unless the work is specifically indicated on the Drawings to be furnished under this Section.

B. Underground anchors, and pads for valve access boxes are included under this Section of the Specification. Concrete shall be 3000 psi test minimum. Refer to Division 03 for concrete types.

3.9 PIPE PROTECTION

A. Wrap bare galvanized and black steel pipe buried in the ground and to 6" above grade, including piping in conduit, with one of the following, or equal:

1. Polyethylene Coating: Pressure sensitive polyethylene coating, "X-Tru-Coat" as manufactured by Pipe Line Service Corporation or "Green Line" wrap as manufactured by Roystron Products, or equal.
    a. Field Joints and Fittings: Protecto Wrap #1170 tape as manufactured by Pipe Line Service Corporation, or Primer #200 tape by Roystron Products, or equal. Installation shall be as per manufacturer's recommendation and instructions.
2. Tape Wrap: Pressure-sensitive polyvinyl chloride tape, "Transtex #V-l0 or V-20", "Scotchwrap 50", Slipknot l00, PASCO Specialty & Mfg., Inc., or equal, with continuous identification. Tape shall be a minimum of 20 mils thick for fittings and irregular surfaces, two wraps, 50 percent overlap, 40 mils total thickness. Tape shall be laminated with a suitable adhesive; widths as recommended by the manufacturer for the pipe size. Wrap straight lengths of piping with an approved wrapping machine.

B. Field Joints: Valves and Fittings: double wrap polyvinyl chloride tape as above. Provide at least two thicknesses of tape over the joint and extend a minimum of 4 inches over adjacent pipe

covering. Build up with primer to match adjacent covering thickness. Width of tape of fittings shall not exceed 3 inches. Tape shall adhere tightly to all surfaces of the fittings without air pockets.

C. Testing: Test completed wrap of piping, including all epoxy painted piping with Tinker and Rasor Co. holiday detector, or equal.

D. Cleaning: Clean all piping thoroughly before wrapping.
   1. Inspection: Damaged or defective wraps shall be repaired as directed. No wrapped pipe shall be covered until approved by Architect.

E. Covering: No rocks or sharp edges shall be backfilled against the wrap. When backfilling with other than sand, protect wrap with an outer wrapping of Kraft paper; leave in place during backfill.

3.10 EXPANSION ANCHORS IN HARDENED CONCRETE

A. Qualification Tests: The specific anchor shall have a current ICC-ES report and evaluated in cracked concrete in accordance with Acceptance Criteria AC193. If the specific anchor satisfies cyclic testing requirements per Acceptance Criteria AC01, Section 5.6, the full allowable shear and tension loads listed in the current ICC-ES report and manufacturer's recommendations for the specific anchor may be used. Otherwise, the design shear and tension loads shall not be more than 80% of the listed allowable shear and tension loads for the specific anchor.

B. Installation: The anchors must be installed in accordance with the requirements given in ICC Research Committee Recommendations for the specific anchor.

C. Testing: Fifty percent of the anchors shall be load-tested on each job to twice the allowable capacity in tension, except that if the design load is less than 75 pounds; only one anchor in ten need be tested. If any anchor fails, all anchors must be tested. The load test shall be performed in the presence of a special inspector.

D. The load may be applied by any method that will effectively measure the tension in the anchor, such as direct pull with a hydraulic jack, a torque wrench calibrated using the specific anchor or calibrated spring-loading devices. Anchors in which the torque is used to expand the anchor without applying tension to the bolt may not be verified with a torque wrench.

3.11 PIPING SYSTEM PRESSURE TESTING

A. General:
   1. Perform operational tests under simulated or actual service conditions.
   2. Repair leaks and defects with new materials, and retest piping or portion thereof until satisfactory results are obtained.

B. Piping Systems: Test the installations in accordance with the following requirements and applicable codes:
   1. Notify the Architect at least seven days in advance of testing.
   2. Authority having jurisdiction shall witness tests of piping systems.
   3. Piping shall be tested at completion of roughing-in, or at other times as directed by the Architect.
   4. Furnish necessary materials, test pumps, gases, instruments and labor required for testing.
   5. Isolate from system equipment that may be damaged by test pressure.

C. Test Schedule: No loss in pressure or visible leaks shall show after four hours at the pressures indicated.

System Tested	Test Pressure PSI	Test With
All Hot, Chilled, Combination, Condenser Water Piping	Greater of 1-1/2 x WP or 100 psi	Water

D. Testing, Evacuating, Charging and Lubrication of Refrigeration Systems:
1. Pressurize with dry nitrogen and/or refrigerant to 300 psig and test all joints with an electronic detector or halide torch. Release the pressure and attach a high vacuum pump. Evacuate to 4 mm (4000 microns) and hold for 30 minutes. Break to 5 psig with dry nitrogen and allow to remain in the system for ten minutes. Evacuate to 2 mm (2000 microns) and hold for 30 minutes. Use a mercury manometer or electronic vacuum gauge. Do not start timing until recommended vacuum range is reached.
2. At the end of the evacuation, if the system has been proved leak-free, charge with refrigerant and fill the crankcase to the oil level specified by the manufacturer. All refrigerant oil shall be delivered to the location in sealed containers.
3. Replenish for a period of one year without cost to the Owner all refrigerant and oil required to maintain the proper levels.

3.12 OPERATION OF SYSTEMS

A. Do not operate any mechanical equipment for any purpose, temporary or permanent, until all of the following has been completed:
1. Complete all requirements listed under “Check, Test and Start Requirements.”
2. Ductwork and piping has been properly cleaned. Piping systems shall be flushed and treated prior to operation.
3. Filters, strainers etc. are in place.
4. Bearings have been lubricated, and alignment of rotating equipment has been checked.
5. Equipment has been run under observation, and is operating in a satisfactory manner.

B. Provide test and balance agency with one set of Contract Drawings, Specifications, Addenda, Change orders issued, applicable shop drawings and submittals and temperature control drawings.

3.13 CHECK, TEST AND START REQUIREMENTS

A. An authorized representative of the equipment manufacturer shall perform check, test and start of each piece of mechanical equipment. The representative may be an employee of the equipment manufacturer, or a manufacturer-certified contractor. Submit written certification from the manufacturer stating that the representative is qualified to perform the check test and start of the equipment.
1. As part of the submittal process, provide a copy of each manufacturer’s printed startup form to be used.
2. Some items of specified equipment may require that check, test and start of equipment must be performed by the manufacturer, using manufacturer’s employees. See specific equipment Articles in these Specifications for this requirement.
3. Provide all personnel, test instruments, and equipment to properly perform the check, test and start work.
4. When work has been completed, provide copies of reports for review, prior to final observation of work.

B. Provide copies of the completed check, test and start report of each item of equipment, bound with the Operation and Maintenance Manual.

C. Upon completion of the work, provide a schedule of planned maintenance for each piece of equipment. Indicate frequency of service, recommended spare parts (including filters and lubricants), and methods for adjustment and alignment of all equipment components. Provide a copy of the schedule with each Operation and Maintenance Manual. Provide a copy of certification from the Owner's representative indicating that they have been properly instructed in maintenance requirements for the equipment installed.

3.14 DEMONSTRATION AND TRAINING

A. An authorized representative of the equipment manufacturer shall train Owner-designated personnel in maintenance and adjustment of equipment. The representative may be an employee of the equipment manufacturer, or a manufacturer-certified contractor. Submit written certification from the manufacturer stating that the representative is qualified to perform the Owner training for the equipment installed.
   1. As part of the submittal process, provide a training agenda outlining major topics and time allowed for each topic.
   2. Some items of specified equipment require that training must be performed by the manufacturer, using manufacturer's employees. See specific equipment Articles in these Specifications for this requirement.
   3. Contractor shall provide three copies of certification by Contractor that training has been completed, signed by Owner's representative, for inclusion in Operation and Maintenance Manual. Certificates shall include:
      a. Listing of Owner-designated personnel completing training, by name and title.
      b. Name and title of training instructor.
      c. Date(s) of training.
      d. List of topics covered in training sessions.
   4. Refer to specific equipment Articles for minimum training period duration for each piece of equipment.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Balancing Air Systems:
      a. Constant-volume air systems.

1.3 REFERENCES

A. Associated Air Balance Council (AABC)
   1. National Standards for Total System Balance, latest edition.

B. National Environmental Balancing Bureau (NEBB)
   1. Procedural Standards for Testing and Balancing of Environmental Systems, latest edition.

1.4 DEFINITIONS

A. The intent of this Section is to use the standards pertaining to the TAB specialist engaged to perform the Work of this Contract, with additional requirements specified in this Section. Contract requirements take precedence over corresponding AABC or NEBB standards requirements. Differences in terminology between the Specifications and the specified TAB organization standards do not relieve the TAB entity engaged to perform the Work of this Contract of responsibility from completing the Work as described in the Specifications.

B. Similar Terms: The following table is provided for clarification only:

Similar Terms		
Contract Term	AABC Term	NEBB Term
TAB Specialist	TAB Agency	NEBB Certified Firm
TAB Standard	National Standards for Testing and Balancing Heating, Ventilating, and Air Conditioning Systems	Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems
TAB Field Supervisor	Test and Balance Engineer	Test and Balance Supervisor

C. AABC: Associated Air Balance Council.

D. NEBB: National Environmental Balancing Bureau.

E. TAB: Testing, adjusting, and balancing.

F. TAB Organization: Body governing practices of TAB Specialists.

G. TAB Specialist: An entity engaged to perform TAB Work.

1.5 ACTION SUBMITTALS

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: Within 30 days of Contractor's Notice to Proceed, submit documentation that the TAB specialist and this Project's TAB team members meet the qualifications specified in "Quality Assurance" Article.
   1. Provide list of similar projects completed by proposed TAB field supervisor.
   2. Provide copy of completed TAB report, approved by mechanical engineer of record for a completed project with similar system types and of similar complexity.

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.
   1. Submit examinations report with qualifications data.

C. Strategies and Procedures Plan: Within 60 days of Contractor's Notice to Proceed, submit TAB strategies and step-by-step procedures as specified in "Preparation" Article.

D. Interim Reports. Submit interim reports as specified in Part 3. Include list of system conditions requiring correction and problems not identified in Contract Documents examination report.

E. Certified TAB reports.
   1. Provide three printed copies of final TAB report. Provide one electronic file copy in PDF format.

F. Sample report forms.

G. 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.
      a. Instruments to be used for testing and balancing shall have been calibrated within a period of one year, or less if so recommended by instrument manufacturer and be checked for accuracy prior to start of work.

1.7 QUALITY ASSURANCE

A. Independent TAB Specialist Qualifications: Engage a TAB entity certified by AABC or NEBB.
   1. The certification shall be maintained for the entire duration of TAB work for this Project. If TAB specialist loses certification during this period, the Contractor shall immediately notify the Architect and submit another TAB specialist for approval. All work specified in this Section and in other related Sections performed by the TAB specialist shall be invalidated if the TAB specialist loses certification, and shall be performed by an approved successor.

B. To secure approval for the proposed TAB specialist, submit information certifying that the TAB specialist is either a first tier subcontractor engaged and paid by the Contractor, or is engaged

and paid directly by the Owner. TAB specialist shall not be affiliated with any other entity participating in Work of this Contract, including design, furnishing equipment, or construction. In addition, submit evidence of the following:

1. TAB Field Supervisor: Full-time employee of the TAB specialist and certified by AABC or NEBB.
    a. TAB field supervisor shall have minimum 10 years supervisory experience in TAB work.
2. TAB Technician: Full-time employee of the TAB specialist and who is certified by AABC or NEBB as a TAB technician.
    a. TAB technician shall have minimum 4 years TAB field experience.

C. TAB Specialist engaged to perform TAB work in this Project shall be a business limited to and specializing in TAB work, or in TAB work and Commissioning.

D. TAB specialist engaged to perform TAB work shall not also perform commissioning activities on this Project.

E. Certified TAB field supervisor or certified TAB technician shall be present at the Project site at all times when TAB work is performed.
1. TAB specialist shall maintain at the Project site a minimum ratio of one certified field supervisor or technician for each non-certified employee at times when TAB work is being performed.

F. Contractor shall notify Architect in writing within three days of receiving direction resulting in reduction of test and balance scope or other deviations from Contract Documents. Deviations from the TAB plan shall be approved in writing by the mechanical engineer of record for the Project.

G. TAB Standard:
1. Perform TAB work in accordance with the requirements of the standard under which the TAB agencies' qualifications are approved unless Specifications contain different or more stringent requirements:
    a. AABC National Standards for Total System Balance, or
    b. NEBB Procedural Standards for Testing, Adjusting, Balancing of Environmental Systems.
2. All recommendations and suggested practices contained in the TAB standard are mandatory. Use provisions of the TAB standard, including checklists and report forms, to the extent to which they are applicable to this Project.
3. Testing, adjusting, balancing procedures, and reporting required for this Project, and not covered by the TAB standard applicable to the TAB specialist engaged to perform the Work of this Contract, shall be submitted for approval by the design engineer.

H. TAB Conference: Meet with Architect and mechanical engineer on approval of the TAB strategies and procedures plan to develop a mutual understanding of the project requirements. Require the participation of the TAB field supervisor. Provide seven days' advance notice of scheduled meeting time and location. TAB conference shall take place at location selected by Architect offices of Capital.
1. Agenda Items:
    a. The Contract Documents examination report.
    b. The TAB plan.
    c. Coordination and cooperation of trades and subcontractors.
    d. Coordination of documentation and communication flow, including protocol for resolution tracking and documentation.
2. The requirement for TAB conference may be waived at the discretion of the mechanical engineer of record for the Project.

I. 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.

J. TAB Report Forms: Use standard TAB specialist's forms approved by Architect.

K. Instrumentation Type, Quantity, Accuracy, and Calibration: As described in ASHRAE 111, Section 5, "Instrumentation."

1.8 WARRANTY

A. Provide workmanship and performance warranty applicable to TAB specialist engaged to perform Work of this Contract:
   1. AABC Performance Guarantee.
   2. NEBB Quality Assurance Program.

B. Refer to Division 01 Specifications for additional requirements.

1.9 COORDINATION

A. Notice: Provide seven days' advance notice for each test. Include scheduled test dates and times.

B. Perform TAB after leakage and pressure tests on air and water distribution systems have been satisfactorily completed.

C. Coordinate TAB work with work of other trades.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Contract Documents Examination Report:
   1. TAB specialist shall review Contract Documents, including plans and specifications. Provide report listing conditions that would prevent the system(s) from operating in accordance with the sequence of operations specified, or would prevent accurate testing and balancing:
      a. Identify each condition requiring correction using equipment designation shown on Drawings. Provide room number, nearest building grid line intersection, or other information necessary to identify location of condition requiring correction.
      b. Proposed corrective action necessary for proper system operation.

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 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.

F. Examine system and equipment installations and verify that field quality-control testing, cleaning, and adjusting specified in individual Sections have been performed.

G. Examine test reports specified in individual system and equipment Sections.

H. 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.

I. Examine operating safety interlocks and controls on HVAC equipment.

J. Report conditions requiring correction discovered before and during performance of TAB procedures.

K. Observe and record system reactions to changes in conditions. Record default set points if different from indicated values.

3.2 PREPARATION

A. Prepare a TAB plan that includes strategies and step-by-step procedures. TAB plan shall be specific to Project and include the following:
   1. General description of each air system and sequence(s) of operation.
   2. Complete list of measurements to be performed.
   3. Complete list of measurement procedures. Specify types of instruments to be utilized and method of instrument application.
   4. Qualifications of personnel assigned to Project.
   5. Single-line CAD drawings reflecting all test locations (terminal units, grilles, diffusers, traverse locations, etc.
   6. Table indicating pressure relationships (positive, negative, or neutral) between building spaces.
   7. Air terminal correction factors for the following:
      a. Air terminal configuration.
      b. Flow direction (supply or return/exhaust).
      c. Effective area of each size and type of air terminal.
      d. Air density.

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. Ceilings are installed in critical areas where air-pattern adjustments are required and access to balancing devices is provided.
   6. Windows and doors can be closed so indicated conditions for system operations can be met.

3.3 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" or NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems" and in this Section.

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. Install and join new insulation that matches removed materials. Restore insulation, coverings, vapor barrier, and finish according to Section 238000 Heating, Ventilating, and Air Conditioning."

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.

3.4 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. Test each system to verify building or space operating pressure, including all stages of economizer cycle. Maximum building pressure shall not exceed 0.03 inches of pressure.

C. Except as specifically indicated in this Specification, Pitot tube traverses shall be made of each duct to measure airflow. Pitot tubes, associated instruments, traverses, and techniques shall conform to ASHRAE Handbook, HVAC Applications, and ASHRAE Handbook, HVAC Systems and Equipment.
   1. Use state-of-the-art instrumentation approved by TAB specialists governing agency..
   2. Where ducts' design velocity and air quantity are both less than 1000 fpm/CFM, air quantity may be determined by measurements at terminals served.

D. Test holes shall be placed in straight duct, as far as possible downstream from elbow, bends, take-offs, and other turbulence-generating devices.

E. Determine the best locations in main and branch ducts for accurate duct-airflow measurements.

F. 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.

G. Locate start-stop and disconnect switches, electrical interlocks, and motor starters.

H. Verify that motor starters are equipped with properly sized thermal protection.

I. Check dampers for proper position to achieve desired airflow path.

J. Check for airflow blockages.

K. Check condensate drains for proper connections and functioning.

L. Check for proper sealing of air-handling-unit components.

M. Verify that air duct system is sealed as specified in Section 238000 “Heating, Ventilating, and Air Conditioning.”

N. Provide for adjustments or modifications to fan and motor sheaves, belts, damper linkages, and other components as required to achieve specified air balance at no additional cost to Owner.

O. Automatically operated dampers shall be adjusted to operate as indicated in Contract Documents. Controls shall be checked for proper calibration.

3.5 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. Alternative methods shall be examined for determining total CFM, i.e., Pitot-tube traversing of branch ducts, coil or filter velocity profiles, prior to utilizing airflow values at terminal outlets and inlets.
   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.
      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 Architect 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. Check operation of relief air dampers. Measure total relief air quantity at each stage of normal, economizer, power exhaust, or power exhaust economizer operation, as applicable to installed equipment. Adjust relief air dampers to provide 100 percent relief in economizer mode. Ensure that relief dampers close completely upon unit shutdown.

C. Check operation of outside air dampers. Measure total outside air quantity at each stage of normal, economizer, power exhaust, or power exhaust economizer operation, as applicable to

installed equipment. Adjust outside air dampers to provide 100 percent outside air in economizer mode. Ensure that outside air dampers close completely upon unit shutdown.

D. 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.

E. Measure air outlets and inlets without making adjustments.
   1. Measure terminal outlets using a direct-reading digital backflow compensating hood. Use outlet manufacturer's written instructions and calculating factors only when direct-reading hood cannot be used due to physical obstruction or other limiting factors. Final report shall indicate where values listed have not been obtained by direct measurement.

F. 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, if included.
   2. Adjust patterns of adjustable outlets for proper distribution without drafts. Terminal air velocity at five feet above finished floor shall not exceed 50 feet per minute in occupied air conditioned spaces.

G. Do not over pressurize ducts.

3.6 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.

B. Interim Reports: Prepare periodic lists of conditions requiring correction and problems found in systems being tested and balanced. Prepare a separate report for each system and each building floor for systems serving multiple floors.

3.7 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 field supervisor. Report shall be co-signed by the Contractor, attesting that he has reviewed the report, and the report has been found to be complete and accurate.

2. The certification sheet shall be followed by sheet(s) listing items for which balancing objectives could not be achieved. Provide explanation for failure to achieve balancing objectives for each item listed.
3. 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 specialist.
3. Project name.
4. Project location.
5. Project Performance Guaranty
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. 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. Fan drive settings including settings and percentage of maximum pitch diameter.
    e. Settings for supply-air, static-pressure controller.
    f. 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. Terminal units.
5. Balancing stations.
6. Position of balancing devices.

E. Air distribution outlets and inlets shall be shown on keyed plans with designation for each outlet and inlet matching designation used in Contract Documents and TAB test reports. Room numbers shall be included in keyed plans and test reports. Where multiple outlets and inlets are installed within a single room, a designation shall be assigned and listed for each outlet and inlet in addition to room number.

F. Test Reports – General:
1. All test reports containing air or liquid flow data shall record flow values prior to system adjustment in addition to required data listed for each test report.

G. Air-Handling-Unit Test Reports: For air-handling units with coils, include the following:
   1. Unit Data:
      a. Unit identification.
      b. Location.
      c. Make and type.
      d. Model number and unit size.
      e. Manufacturer's serial number.
      f. Unit arrangement and class.
      g. Discharge arrangement.
      h. Sheave make, size in inches, and bore.
      i. Center-to-center dimensions of sheave, and amount of adjustments in inches.
      j. Number, make, and size of belts.
      k. Number, type, and size of filters.
   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.
   3. Test Data (Indicated and Actual Values):
      a. Total air flow rate in cfm.
      b. Total system static pressure in inches wg.
      c. Fan rpm.
      d. Discharge static pressure in inches wg.
      e. Filter static-pressure differential in inches wg.
      f. Preheat-coil static-pressure differential in inches wg.
      g. Cooling-coil static-pressure differential in inches wg.
      h. Heating-coil static-pressure differential in inches wg.
      i. Outdoor airflow in cfm.
      j. Return airflow in cfm.
      k. Relief airflow in cfm.
      l. Outdoor-air damper position, normal and economizer, power exhaust, or power exhaust economizer modes, as applicable to installed equipment.
      m. Return-air damper position.
      n. Relief-air damper position, normal and economizer, power exhaust, or power exhaust economizer modes, as applicable to installed equipment.

H. Apparatus-Coil Test Reports:
   1. Coil Data:
      a. System identification.
      b. Location.
      c. Coil type.
      d. Number of rows.
      e. Fin spacing in fins per inch o.c.
      f. Make and model number.
      g. Face area in sq. ft.
      h. Tube size in NPS.
      i. Tube and fin materials.
      j. Circuiting arrangement.
   2. Test Data (Indicated and Actual Values):
      a. Air flow rate in cfm.
      b. Average face velocity in fpm.
      c. Air pressure drop in inches wg.
      d. Outdoor-air, wet- and dry-bulb temperatures in deg F.
      e. Return-air, wet- and dry-bulb temperatures in deg F.

f. Entering-air, wet- and dry-bulb temperatures in deg F.
g. Leaving-air, wet- and dry-bulb temperatures in deg F.
h. Entering-water temperature in deg F.
i. Leaving-water temperature in deg F.

I. 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.

J. 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.

K. Air-Terminal-Device Reports:
1. Unit Data:
a. System and air-handling unit identification.
b. Location and zone.
c. Apparatus used for test.
d. Area served.
e. Make.
f. Number from system diagram.
g. Type and model number.
h. Size.
i. Effective area in sq. ft.

2. Test Data (Indicated and Actual Values):
   a. Air flow rate in cfm.
   b. Air velocity in fpm.
   c. Preliminary air flow rate as needed in cfm.
   d. Preliminary velocity as needed in fpm.
   e. Final air flow rate in cfm.
   f. Final velocity in fpm.
   g. Space temperature in deg F.

L. Instrument Calibration Reports:
1. Report Data:
   a. Instrument type and make.
   b. Serial number.
   c. Application.
   d. Dates of use.
   e. Dates of calibration.

3.8 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 Architect.
2. The TAB specialist's test and balance engineer shall conduct the inspection in the presence of Architect.
3. Architect 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 10 percent, 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 contact the TAB specialists' governing organization for remedial action by the governing organization under the workmanship and performance warranty. See article, Warranty.

3. If remedial action is not provided by the TAB specialists' governing organization in a timely manner, Owner may contract the services of another TAB specialist to complete the TAB Work according to the Contract Documents and deduct the cost of the services from the original TAB specialists' final payment.

D. Prepare test and inspection reports.

3.9 ADDITIONAL TESTS

A. 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

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Roof mounted air conditioning units.
2. Cooling coils.
3. Refrigerant piping and fittings.
4. Filters.
5. Dampers.
6. Ductwork.
7. Insulation.

1.2 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract apply to this Section.

B. Section 230050, Basic HVAC Materials and Methods.

C. Section 230593, Testing, Adjusting, and Balancing for HVAC.

D. Section 230923, Direct Digital Control (DDC) System for HVAC.

1.3 ACTION SUBMITTALS

A. For additional requirements, refer to Section 230050, Basic HVAC Materials and Methods.

B. Product Data: Submit manufacturer's technical product data, including rated capacities of selected model clearly indicated, dimensions, weight, corner or mounting point weights, furnished specialties and accessories; and installation and start-up instructions. Product data shall include applicable product listings and standards. Refer to Section 230050, Basic HVAC Material and Methods for additional requirements.

C. Engineering Data: Submit fan curves and sound power level data for each fan unit. Data shall be at the scheduled capacity. Data shall include the name of the rating agency or independent laboratory.

1.4 INFORMATIONAL SUBMITTALS

A. For additional requirements, refer to Section 230050, Basic HVAC Materials and Methods.

B. Roof Curb Data: For roof mounted equipment where combined weight of equipment unit and roof curb or rail exceeds 400 pounds, submit calculations from manufacturer for roof curbs proving compliance with the seismic requirements of the California Building Code, and ASCE 7-10. Manufacturer shall certify that roof curbs are suitable for use indicated on Drawings and in Specifications for the seismic design category indicated in structural Contract Documents. Calculations shall be stamped and signed by a State of California registered structural engineer.

C. Record of pre-installation meeting.

D. Coordinated Layouts: Submit coordinated layouts. For requirements refer to article, Coordinated Layouts, in this Section.

1.5 CLOSEOUT SUBMITTALS

A. For additional requirements, refer to Section 230050, Basic HVAC Materials and Methods.

B. Maintenance Data: Submit maintenance data and parts list for each piece of equipment, control, and accessory; including "trouble-shooting guide," in Operation and Maintenance Manual.

C. Record Drawings: Submit Record Drawings of installed ductwork, duct accessories, and outlets and inlets in accordance with requirements of Division 01.

1.6 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(s) for each belt-driven unit.
2. Provide one complete set(s) of filters for each filter bank.

1.7 COORDINATED LAYOUT

A. Coordinated layouts are required to amplify, expand and coordinate the information contained in the Contract Documents.

B. Provide minimum 1/4 inch equals one foot scaled coordinated layout drawings showing plan and pertinent section or elevation views of piping, ductwork, equipment, accessories, and electrical systems. Drawings shall be reproducible and work of each trade represented shall be fully coordinated with structure, other disciplines, and finished surfaces. Drawings shall be presented on a single size sheet. Coordinated layout drawings shall have title block, key plan, north arrow and sufficient grid lines to provide cross-reference to design Drawings.
1. Provide a stamp or title block on each drawing with locations for signatures from all contractors involved, including but not limited to the General, HVAC, Plumbing, Fire Protection, and Electrical contractors. Include statement for signature that the contractor has reviewed the coordinated layout drawings in detail and has coordinated the work of his trade.
2. Show on drawings the intended elevation of all ductwork in accordance with the following example:
   a. B.O.D. = 9'-0"
      OFFSET UP 6"
      B.O.D. = 9'-6"
3. Highlight, encircle or otherwise indicate deviations from the Contract Documents on the coordinated layouts. Architect will not be responsible for identifying deviations from the original Contract Documents.

C. Since scale of contract drawings is small and all offsets and fittings are not shown, Contractor shall make allowances in bid for additional coordination time, detailing, fittings, offsets, hangers and the like to achieve a fully coordinated installation. If changes in duct size are required, equivalent area shall be maintained and the aspect ratio shall not be in excess of 2 to 1 unless approved by the engineer. Drawings shall be submitted for review prior to fabrication and installation. Drawings may be submitted in packages representing at least one quarter of the building ductwork.

D. Check routing on all ductwork before fabricating. Report any discrepancies to Architect. No extra cost will be allowed for failure to conform to above.

1.8 QUALITY ASSURANCE

A. Design Criteria:
1. All equipment and accessories to be the product of a manufacturer regularly engaged in its manufacture. All gas-fired equipment shall be UL, ETL or CSA listed.
2. Supply all equipment and accessories in accordance with requirements of applicable national, state and local codes.
3. All items of a given type shall be products of the same manufacturer.
4. Scheduled equipment performance is minimum capacity required.
5. Scheduled electrical capacity shall be considered as maximum available.
6. Scheduled gas BTU input shall be considered as maximum available.

1.9 FIELD CONDITIONS

A. Interruption of Existing Services: Do not interrupt services to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary services according to requirements indicated:
1. Notify Owner no fewer than two days in advance of proposed interruption of services.
2. Do not interrupt services without Owner's written permission.

1.10 WARRANTY

A. Air Conditioning Unit, Roof-Mounted:
1. Compressor shall have a five-year warranty.
2. Standard heat exchanger shall have a ten-year warranty.

B. Air Cooled Condensing Unit: Unit shall have 5-year limited compressor warranty.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Insulation products, including insulation, insulation facings, jackets, adhesives, sealants and coatings shall not contain polybrominated diphenyl ethers (PBDEs) in penta, octa, or deca formulations in amounts greater than 0.1 percent (by mass).

2.2 GAS FIRED EQUIPMENT

A. All gas-fired equipment shall be listed for use as a gas appliance.

B. All units shall comply with the emissions requirements of the Air Quality Management District (AQMD) in which they are to be installed.

2.3 AIR CONDITIONING UNIT, ROOF-MOUNTED

A. Provide factory assembled single packaged outdoor rooftop mounted, electrically controlled gas heating and electric cooling unit, rated in accordance with ARI Standards 210/240 or 340/360, and ETL or UL listed and labeled, classified in accordance with UL 1995. Provide refrigerant

charge R-410A, all internal wiring, piping, controls, and special features required prior to field startup. Design unit to conform to the following:

1. California NOx emission requirements.
2. ASHRAE 15.
3. ASHRAE 90.1.
4. Insulation, adhesive, and all materials exposed to air stream shall meet NFPA 90A requirements for flame spread and smoke generation.
5. Unit casing shall be capable of withstanding 500-hour salt spray exposure per ASTM B117 (scribed specimen).

B. Unit shall be rated in accordance with ARI sound standards 270 or 370.

C. Unit shall be ETL or UL tested and certified in accordance with ANSI Z21.47 Standards as a total package.

D. Roof curb shall be designed to conform to NRCA Standards.

E. Unit shall be designed and manufactured in accordance with ISO 9001.

F. For unit sizes applicable to Energy Star program, units shall be Energy Star qualified.

G. Cabinet:
1. Provide galvanized steel unit cabinet, bonderized and coated with a baked enamel finish.
2. All airstream interior surfaces shall be insulated with a minimum 1/2 inch thick, 1.5 lb density cleanable insulation. Insulation shall be encapsulated with panel design or have sealed edges.
3. Cabinet panels shall be hinged with integrated non-corrosive hinges. Provide hinged access panels for the filter, compressors, evaporator fan, and control box/ heat section areas. Each panel shall have multiple latches and handles. Each external hinged access panel shall be permanently attached to the rooftop unit.
4. Return air filters shall be accessible through a dedicated hinged access panel.
5. Fork lift slots and rigging holes shall be provided in unit base rails. Base rails shall be minimum 16 gauge.
6. Unit shall have an integral sloped condensate drain pan, providing minimum 3/4 in.-14 NPT connections for horizontal drain configuration. Provide unit with alternate vertical thru-the-bottom drain connection when furnished as standard for units sizes scheduled on Drawings. See Drawings for drain configuration. Pan shall be removable for cleaning and maintenance. All drain pans shall conform to ASHRAE 62.1 self-draining provisions.
7. Unit shall have standard side and alternate field or factory installed thru-the-bottom power and control wiring connection capability. Thru-the-bottom electrical connections shall use manufacturer’s approved water-tight connection method.
8. Unit shall be field convertible to, or factory furnished with, horizontal air discharge, as applicable for unit sizes as scheduled on Drawings.

H. Fans:
1. Centrifugal supply air blower (evaporator fan) shall have sealed, permanently lubricated ball bearings, or rigid pillow block bearings, as supplied as standard equipment for unit sizes scheduled on Drawings. Units supplied with pillow block bearings shall be furnished with accessible lubricant fittings. Provide belt-driven double inlet fan wheel, centrifugal type with forward curved blades and adjustable sheaves. Multiple speed direct drive motors may be utilized when supplied as standard equipment for efficiency and electrical requirements as scheduled on the Drawings. Fan wheel shall be steel, with corrosion resistant finish, dynamically balanced.
2. Condenser fans shall be of the direct-driven propeller type, with corrosion-resistant aluminum blades. Fans shall be dynamically balanced and discharge air upwards. Induced-

draft blower shall be of the direct-driven, single inlet, forward-curved, centrifugal type, made from aluminized steel with a corrosion-resistant finish and shall be dynamically balanced.

3. Induced draft fan shall be of the direct driven, single inlet, forward-curved centrifugal type. Fan wheel shall be steel, with corrosion resistant finish, dynamically balanced.

I. Motors:
   1. Compressor motors shall be cooled by refrigerant gas passing through motor windings and shall have line break thermal and current overload protection.
   2. Evaporator fan motor shall have permanently lubricated, sealed bearings and inherent automatic-reset thermal overload protection or manual reset calibrated circuit breakers.
   3. Totally enclosed condenser-fan motor shall have permanently lubricated, sealed bearings, and inherent automatic-reset thermal overload protection.
   4. Induced-draft motor shall have permanently lubricated sealed bearings and inherent automatic-reset thermal overload protection.
   5. For single-phase fan motors sized larger than 1/12 hp and smaller than 1 hp, refer to Article, Electric Motors, in Section 230050, Basic HVAC Materials and Methods.

J. Compressor:
   1. Fully hermetic, scroll type with internal high-pressure and temperature protection.
   2. Factory installed rubber shock mounted and internally spring mounted for vibration isolation.
   3. Compressor Anti-Recycle Timer: Compressor shall be prevented from restarting for a minimum of five minutes after shutdown, with manufacturers installed compressor cycle delay.

K. Coils:
   1. Standard evaporator and condenser coils shall have aluminum plate fins mechanically bonded to seamless internally finned copper tubes with all joints brazed.
   2. Units shall have face-split type evaporator coils.
   3. For units with single compressor, condenser coils shall be single slab, single pass design. For dual compressor units, condenser coils shall be single slab, 2 pass design.
   4. Evaporator coils shall be leak tested at minimum 150 psig, and pressure tested at minimum 450 psig.
   5. Condenser coils shall be leak tested at minimum 150 psig, and pressure tested at minimum 650 psig.

L. Heating Section:
   1. Induced-draft combustion type with direct-spark ignition system and redundant main gas valve with 2-stage capability on all 3-phase units.
   2. Heat Exchanger:
      a. The standard aluminized heat exchanger shall be of the tubular-section type constructed of minimum 20-gage aluminized steel.
   3. Burners shall be of the in-shot type constructed of aluminum-coated steel.
   4. All gas piping shall enter the unit at a single location. Gas entry shall be through side or bottom of unit. See Drawings for gas entry location. When bottom gas entry is utilized, unit shall be furnished with field installed conversion kit, arranged so that gas shut-off valve is accessible from the roof.
   5. All factory-installed orifices are for operation up to 2,000 feet of altitude. For altitudes between 2,000 feet and 7,000 feet, a factory certified kit shall be furnished for field installation.
   6. Units shall be suitable for use with natural gas or propane. Provide field-installed propane conversion kit as required, see schedule on Drawings.
   7. The integrated gas controller board shall include gas heat operation fault notification using an LED (light-emitting diode).

8. Unit shall be equipped with anti-cycle protection with one short cycle on unit flame rollout switch or 4 continuous short cycles on the high-temperature limit switch. Fault indication shall be made using an LED.
9. The integrated gas controller board shall contain algorithms that modify evaporator-fan operation to prevent future cycling on high-temperature limit switch.
10. The LED shall be visible without removal of control box access panel.
11. Gas burner tray shall be removable for maintenance.
12. Heating section shall be insulated with foil-faced fiberglass insulation.

M. Refrigerant Components:
1. Each refrigerant circuit shall include:
   a. Balanced port thermostatic expansion valve (TXV) with removable power element.
   b. Solid core refrigerant filter driers with pressure ports.
   c. Refrigerant pressure gage ports and connections on suction, discharge, and liquid lines.

N. Filter Section:
1. Standard filter section shall accommodate 2 inch deep filters. Filters shall conform to the “Air Filters” Article in this Specification Section.
2. Filter section shall use standard size filters.

O. Controls:
1. Unit shall be complete with self-contained low voltage fuse protected control circuit. Refer to Section 255000, if included, and equipment schedule, sequence of operation and control diagram on Drawings for additional requirements.
2. When third party direct digital controls with an Energy Management System will be utilized, provide electro-mechanical controls with 24V thermostat interface.
3. When stand-alone thermostat operation is utilized, provide electro-mechanical controls with 24V thermostat interface or provide microprocessor controls.
4. When stand-alone thermostat operation is utilized for single-zone VAV units, provide microprocessor controls. Units shall have factory mounted supply fan variable frequency drives.
5. When third party direct digital controls with an Energy Management System will be utilized for single zone VAV units, provide microprocessor controls with BACnet or LON interface. Units shall have factory mounted supply fan variable frequency drives.
6. Electro-mechanical controls shall include the following, as a minimum:
   a. Service run test capability.
   b. Provide compressor minimum run time (3 minutes) and minimum off time (5 minutes).
   c. Economizer control.
   d. Unit shall have 35° F low ambient cooling operation.
   e. Time delay relay.
7. Microprocessor controls shall include the following, as a minimum:
   a. User diagnostic interface.
   b. Unit control with standard suction pressure transducers and condensing temperature thermistors.
   c. Shall provide a 5° F temperature difference between cooling and heating set points to meet ASHRAE 90.1 energy standard.
   d. Service run test capability.
   e. Shall accept input from a CO2 sensor (indoor).
   f. Configurable alarm light shall be provided which activates when certain types of alarms occur.
   g. Provide compressor minimum run time (3 minutes) and minimum off time (5 minutes).
   h. Service diagnostic mode.
   i. Economizer control.

j. Unit shall have 0° F low ambient cooling operation.
k. Time delay relay.

P. Safeties:
1. Unit shall incorporate a solid-state compressor lockout that provides optional reset capability at the space thermostat, should any of the following safety devices trip and shut off compressor:
a. Compressor lockout protection provided for either internal or external overload.
b. Low-pressure protection.
c. Freeze protection (evaporator coil).
d. High-pressure protection (high pressure switch or internal).
e. Compressor reverse rotation protection.
f. Loss of charge protection.
g. Start assist on singe-phase units.
2. Supply-air sensor shall be located in the unit and detect both heating and cooling operation.
3. Induced draft heating section shall be provided with the following minimum protections:
a. High-temperature limit switch.
b. Induced-draft motor speed sensor.
c. Flame rollout switch.
d. Flame proving controls.
e. Redundant gas valve.
4. Phase Protection: Provide unit-mounted “SymCom,” or equal, Motor Saver three phase voltage monitor, model 201A or equal, adjustable voltage range for each unit, install per manufacturer's recommendations, mount in NEMA 3R enclosure if exposed to the weather.
a. Units shall provide the following features:
1) Low voltage fault trip and reset.
2) Voltage unbalance/phasing fault trip and reset.
3) High voltage fault trip and reset.
4) Transient Protection (Internal).
5) Automatic restart.
b. Provide each unit with 600V socket, “SymCom” model OT08, or equal.

Q. Operating Characteristics:
1. Unit shall be capable of starting and running at 125° F ambient outdoor temperature per maximum load criteria of ARI Standards 210 or 360.
2. Unit will operate in cooling down to an outdoor ambient temperature of 35° F.
3. Unit shall be provided with fan time delay to prevent cold air delivery in heating mode.

R. Electrical Requirements:
1. All unit power wiring shall enter unit cabinet at a single location. Both unit side and bottom power entry provisions shall be provided. Refer to Drawings schedule for thru-the-bottom power wiring requirement.

S. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or equal:
1. Carrier Corporation.
2. Trane Inc.
3. Johnson Controls, Inc.

T. Provide the following additional features and equipment:
1. Roof Curb: Formed galvanized steel with wood nailer strip capable of supporting entire unit weight. Provide 3 inch wide bottom flange.
2. Standard Economizer:
a. Provide unit with unit manufacturer’s standard differential dry-bulb economizer. Economizer control system shall be certified as meeting the requirements for Fault

Detection and Diagnostics (FDD) in the California Building Energy and Efficiency Standards.

3. Other features, accessories, and equipment scheduled on Drawings.

U. Replenish for a period of one year without cost to the Owner all refrigerant and oil required to maintain the proper levels.

V. Owner Training: Manufacturer shall provide two initial on-site 4-hour training sessions for Owners' maintenance personnel. Manufacturer shall provide one 4-hour follow-up training session to be scheduled by Owner within one year of the date of the final initial training session. Training session agenda shall be as follows:
1. First session: Equipment.
2. Second session: Controls.
3. Follow-up session: Agenda by Owner.

2.4 SPLIT SYSTEM HEAT PUMPS

A. General: Furnish and install split system air-to-air heat pump system, with R410A refrigerant, and complete with automatic controls. Equipment shall be shipped factory assembled, wired, tested, and ready for field connections.

B. Quality Assurance:
1. Unit shall be ETL or UL listed and labeled.
2. Unit shall be manufactured in a facility registered to ISO 9001:2000.
3. Unit shall be rated in accordance with ARI standard 210.

C. Delivery, Storage and Handling: Follow manufacturer's recommendations.

D. Heating/Cooling System: The total certified heating/cooling capacity shall not be less than scheduled. The compressor power input shall not exceed that of the unit specified.

E. Indoor Section: Wall mounted, ceiling surface mounted, or ceiling recessed mounted, as indicated on Drawings.
1. Cabinet:
2. Fans: Double inlet, forward curved, statically and dynamically balanced.
3. Fan Motor: Direct drive, permanently lubricated, with two or 4 speed operation for unit size scheduled on Drawings.
   a. For single-phase fan motors sized larger than 1/12 hp and smaller than 1 hp, refer to Article, Electric Motors, in Section 230050, Basic HVAC Materials and Methods.
4. Air Outlet: With motorized horizontal and vertical vanes.
   a. Wall and ceiling surface mounted units: Horizontal vane shall close air outlet upon unit shut-down.
5. Evaporator Coil: Aluminum fins mechanically bonded to copper tubes. Coils shall be pressure leak tested.
6. Insulation: Interior surfaces exposed to the airstream shall be fully insulated.

F. Outdoor Section:
1. Casing: Galvanized steel plate, powder coated with acrylic or polyester.
2. Condenser Fan Grille: ABS plastic.
3. Fan and fan motor: Direct drive, totally enclosed, propeller type, permanently lubricated, horizontal discharge.
4. Compressor: Variable speed rotary type, with crankcase heater and accumulator. Compressor shall be capable of operating at 0 degrees F. Compressor mounted on vibration isolator pads.

5. Coil: Aluminum fins mechanically bonded to copper tubes. Coils shall be pressure leak tested. Provide coil with integral metal guard.

G. Controls: Hard wired, microprocessor based, wall mounted controller with LCD display shall provide the following functions, as a minimum:
1. 7-day programmable timer.
2. Test and check functions.
3. Diagnostic functions.
4. Vane position control.
5. Fan speed adjustment.
6. Temperature adjustment.
7. Automatic restart.
8. Mode selection, including heat/auto/cool/dry/fan.
   a. Provide lockable enclosure for wall mounted controller.

H. Safeties: Shall include the following, as a minimum:
1. Five minute compressor anti-recycle timer.
2. High pressure protection.
3. Current and temperature sensing motor overload protection.

I. Filters: Provide manufacturers washable filters for indoor unit. Provide sufficient filters for four complete changes for each unit.

J. Service Access: All components, wiring, and inspection areas shall be completely accessible through removable panels.

K. Refrigerant Piping:
1. Provide factory pre-charged and sealed line set piping, length to suit the location of equipment. Tubing sizes shall be in accordance with manufacturers written instructions.
2. Provide refrigeration piping in accordance with Article, Refrigerant Piping, in this Section.

L. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or equal:
1. Mitsubishi Electric Corporation.
2. Carrier Corporation.
3. Sanyo Electric Co., Ltd.

M. Owner Training: Manufacturer shall provide one on-site 2-hour training session for Owners' maintenance personnel.

2.5 AIR COOLED CONDENSING UNIT

A. Provide outdoor-mounted, factory assembled, single piece, air-cooled, split-system air conditioner unit suitable for ground or rooftop installation, rated in accordance with ARI Standard 210, and UL or ETL listed and labeled. Provide refrigerant charge R-410A, all internal wiring, piping, controls, compressor, and special features required prior to field start-up. Design unit to conform to the following:
1. ANSI/ASHRAE latest edition.
2. NEC latest edition.
3. Unit cabinet to be capable of withstanding Federal Test Method Standard No. 141 (Method 6061) 500-hr salt spray test.
4. Unit shall be constructed in accordance with UL standards.

B. Unit shall be certified for capacity and efficiency, and listed in the latest ARI directory.

C. Unit shall be manufactured in a facility registered to ISO 9001:2000.

D. Unit shall be Energy Star Qualified.

E. Provide unit with 5 year limited parts warranty.

F. Cabinet:
1. Unit cabinet constructed of galvanized steel, bonderized, and coated with powder coat paint.

G. Fans:
1. Direct-drive propeller type condenser fan, discharging air vertically.
2. Totally enclosed condenser fan motors, 1-phase type with Class B insulation and permanently lubricated bearings, and corrosion resistant shafts.
3. Condenser fan openings equipped with PVC-coated steel wire safety guards.
4. Statically and dynamically balanced fan blades.

H. Compressor:
1. Hermetically sealed compressor mounted on rubber vibration isolators.
2. Compressor with sound insulator.

I. Refrigeration Components:
1. Refrigerant circuit to include liquid and vapor line shut-off valves with sweat connections.
2. System charge of R-410A refrigerant and compressor oil.
3. Unit to be equipped with factory-supplied high-pressure switch, low pressure switch, and filter drier.
4. Provide unit with manufacturer’s refrigerant line set.
5. Provide refrigeration piping in accordance with Article, Refrigerant Piping, in this Section.

J. Condenser Coil:
1. Air-cooled condenser coil constructed of aluminum fins mechanically bonded to copper tubes.
2. Coils shall be leak and pressure tested.

K. Electrical Requirements:
1. Unit shall have single point power connection.
2. Provide unit with 24V control circuit.

L. Operating Characteristics:
1. Unit shall be capable of starting and running a 115 degrees F ambient outdoor temperature per maximum load criteria of ARI Standard 210.
2. Compressor with standard controls shall be capable of operation down to 55 degrees F ambient outdoor temperature.

M. Provide the following additional components and features:
1. Provide evaporator freeze thermostat, winter start control, compressor start assist capacitor and relay, low ambient controller, and ball bearing fan motor.
2. Provide expanded metal coil guard for all sides of the air-cooled condensing unit. Coil guard shall be as manufactured by MicroMetl, Can-Fab, or equal.

N. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or equal:
1. Carrier Corporation.
2. Trane Inc.

O. Owner Training: Manufacturer shall provide one on-site 1-hour training sessions for Owners' maintenance personnel.

2.6 COOLING COIL

A. Provide direct expansion encased cooling coil.
   1. Install encased coil to operate properly in vertical or horizontal position as required. Construct coil with aluminum plate fins mechanically bonded in non-ferrous tubing with all joints brazed ultrasonically. Coil shall have factory-installed refrigerant metering device, refrigerant line fittings which permit mechanical connections, and condensate pan with primary and auxiliary drain connections.
   2. Construct casings of galvanneal steel, bonderize, insulate, and finish with baked enamel.

2.7 REFRIGERATION PIPE AND FITTINGS

A. Refrigeration gas and liquid piping shall be type ACR hard drawn copper tubing, cleaned and capped in accordance with ASTM B280, with wrought copper fittings. All joints shall be brazed with Sil-fos under nitrogen purge. Relief valve discharge piping shall be full size of relief discharge port.
   1. Manufactured, pre-charged and pre-insulated refrigerant line-set refrigerant piping may be utilized at Contractor's discretion.
      a. VRF Systems: Use of manufactured, pre-charged and pre-insulated refrigerant line-set refrigerant piping between outdoor condensing units and indoor heat recovery controllers, or distribution headers and tees is not allowed. When system manufacturer's installation instructions allow use of refrigerant line-set piping between indoor heat recovery controllers, or distribution headers and tees, and air terminal devices, follow instructions for allowable pipe size range and support to avoid forming traps in the piping.

B. Refrigeration Piping Specialties: Furnish and install Superior, Sporlan, Alco, Henry, or equal, stop valves, solenoid valves, adjustable thermal expansion valves, sight glass, flexible connection, charging valve, and drier with valve bypass in the liquid lines and Superior DFN shell and cartridge suction line filter sized 2-1/2 times tonnage.
   1. Install only those refrigeration piping specialties recommended by manufacturer of specific installed equipment.

2.8 REFRIGERANT ACCESS VALVE LOCKING CAPS

A. Each refrigerant circuit access valve located outside buildings, including valves located on roofs, shall be provided with a locking cap. Caps shall be of metal construction, with threaded brass inserts. Caps shall be color-coded according to ASHRAE standards for R22 and R410A refrigerant gasses, universal color for other refrigerant gasses. Caps shall be removable only with cap manufacturer's handheld tool.
   1. Provide minimum of two (2) cap removal tools for every ten (10) air conditioning units or other systems containing refrigerant installed under this Project.

2.9 AIR FILTERS

A. Provide MERV 13 disposable pleated media type. Refer to specific equipment Articles for filter depth and for exceptions to this specification. Filters shall conform to the following:
   1. Standards:
      a. ASHRAE Standard 52.2-2007.
      b. Underwriters Laboratories: U.L. 900, Class 2.

2. Construction:
   a. Media: Synthetic or cotton-synthetic blend with radial pleats.
   b. Media Frame: High wet-strength beverage board.
   c. Media Support: Welded wire or expanded metal grid bonded to air leaving side of the media.
3. Performance: 2” deep filter shall have a maximum initial air resistance of 0.31 inches w.g.

B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or equal:
1. Camfil Farr, Inc., model 30/30.
2. Flanders Corporation, model 40 LPD.

C. Temporary (Construction Period) Filters:
1. Install new temporary filters in all units that have filter systems installed. Temporary filters shall match the permanent filters that are specified for the units. Replace filters as needed, in accordance with manufacturer’s directions, in order to provide protection for the unit prior to occupancy by the Owner.
2. If air handling units are operated during construction of the project, install temporary filters directly over each return air inlet. Filters shall match the permanent filters that are specified for the units. Select size of filter to completely cover the frame of the return air inlet, and tape filters firmly in place to eliminate any construction debris from entering the duct system or unit. Remove the temporary filters upon completion of the work, and repair all damaged paintwork.

D. Spare Filters:
1. Furnish two new, complete sets of filter cartridges for each filter bank on completion and acceptance of the work. Install one set of filters in units (prior to final air balance). Provide units designed to accommodate washable, permanent filters with one washable, permanent filter.

2.10 DAMPERS

A. Backdraft Dampers: Ruskin CBD2, counterbalanced, Nailer Industries, or equal.

B. Manual Air and Balance Dampers: Provide dampers of single blade type or multi-blade type constructed in accordance with SMACNA, "HVAC Duct Construction Standards," except as noted herein.
1. Rectangular Ductwork:
   a. Single damper blades may be used in ducts up to 10 inches in height. Dampers shall be 16 gauge minimum. Provide self-locking regulators, equal to Ventlok 641. Provide end bearings equal to Ventlok 607 at each damper. Provide continuous solid 3/8 inch square shafts.
   b. Multiple blade dampers shall be equal to Ruskin CD35 Standard Control Damper. Maximum width for multiple damper blades for use in rectangular duct shall not exceed 6 inches.
   c. Where duct velocity may be expected to exceed 1500 fpm, provide Ruskin CD-50, or equal, low leakage dampers with airfoil blades.
2. Round Ductwork:
   a. Single damper blades may be used in ducts up to 12 inches in diameter. Provide multiple blade opposed blade dampers, with connected linkage, for ductwork larger than 12 inches in diameter.
   b. Damper blades for round ductwork shall be 20 gauge steel for ducts up to 12 inches diameter and 16 gauge steel for dampers larger than 12 inches damper. Provide self-locking regulators, equal to Ventlok 641, Durodyne, or equal for operation of

dampers. Provide end bearings equal to Ventlok 607 and provide continuous solid 3/8 inch square shafts.

3. Where ductwork is externally insulated, provide self-locking regulators equal to Ventlok 644, Durodyne, or equal for rectangular ductwork, and Ventlok 637, Durodyne, or equal for round ducts.

C. Where required to suit the size of damper required, provide manufacturers standard UL Classified mullions, arranged to support multiple dampers. Assembly shall be of minimum 16 gauge galvanized steel, complete with all accessory caps and framing members required for installation.

2.11 DUCTWORK

A. Construct and install sheet metal ductwork in accordance with the California Mechanical Code for 2 inches static pressure for supply air, and 2 inches minimum for return and exhaust air unless otherwise noted on Drawings.
   1. Where not in conflict with the California Mechanical Code, construct and install all sheet metal ductwork in accordance with SMACNA HVAC Duct Construction Standards (Metal and Flexible). Where applicable for HVAC work, construct and install sheet metal work in accordance with SMACNA Architectural Sheet Metal Manual.
   2. Provide variations in duct size, and additional duct fittings as required to clear obstructions and maintain clearances as approved by the Architect at no extra cost to the Owner.
   3. Gauges, joints and bracing shall be in accordance with the California Mechanical Code.
   4. Provide beading or cross breaking for all ductwork inside building. Provide cross breaking for ductwork exposed to weather.
   5. At the contractor's option, ductwork may be fabricated using the Ductmate, Nexus, Quickduct, Transverse Duct Connection (TDC), Pyramid-Loc duct connection systems, or equal. Fabricate in strict conformance with manufacturer's written installation instructions and in accordance with California Mechanical Code.
      a. Seal flanged ends with pressure sensitive high density, closed cell neoprene or polyethylene tape gasket, Thermo 440, or equal.
      b. Provide metal clips for duct connections, except at breakaway connections for fire dampers and fire smoke dampers. Provide corner clips at each corner of duct, through bolted, at all locations except at breakaway connections for fire dampers and fire smoke dampers. Where used on locations exposed to weather, provide continuous metal clip at top and sides of duct, with 1 inch overhang for top side.

B. Design and installation standards:
   1. SMACNA Compliance: Comply with applicable portions of Sheet Metal and Air Conditioning Contractor's National Association (SMACNA) for all work in this section.
   2. NFPA Compliance: Comply with ANSI/NFPA 90A, "Standard for the Installation of Air Conditioning and Ventilating Systems," and ANSI/NFPA 90B, "Standard for the Installation of Warm Air Heating and Air Conditioning Systems."
   3. California Mechanical Code.

C. Duct sizes indicated are external sizes.

D. Galvanized Sheet Steel: Lock-forming quality, ASTM A924 and ASTM A653, Coating Designation G 90. Provide mill phosphatized finish for exposed surfaces of ducts exposed to view.
   1. Provide mill certification for galvanized material at request of the Project Inspector.

E. Duct Sealants:
   1. Sealant shall have a VOC content of 250 g/L or less.
   2. Sealant shall comply with testing and product requirements of South Coast Air Quality Management District, Rule 1168.

3. Provide one part, non-sag, synthetic latex sealant, formulated with a minimum of 68 percent solids. Sealant shall comply with ASTM E84, Surface Burning Characteristics.
   a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or equal:
      1) Design Polymerics, model DP1010.
      2) Polymer Adhesive Sealant Systems Inc, model Airseal #11.
      3) McGill Airseal, LLC.

F. Duct Support Materials: Except as otherwise indicated, provide hot-dipped galvanized steel fasteners, anchors, straps, trim, and angles for support of ductwork.

G. Rectangular Duct Fabrication:
1. Shop fabricate ductwork of gauges and reinforcement complying with the more stringent of the following standards, except as noted herein.
   a. SMACNA HVAC Duct Construction Standards
   b. California Mechanical Code
2. Fabricate ducts for 2 inch pressure class with minimum duct gauges and reinforcement as follows, except as otherwise noted:

Table A

Duct Dimension	Minimum Gauge	Joint Reinforcement Per CMC
Through 12"	26	Not Required
13" through 18"	24	Not Required
19" through 30"	24	C/4
31" through 42"	22	E/4
43" through 54"	22	F/2
55" through 60"	20	G/4
61" through 84"	20	I/2
85" through 96"	20	J/2
Over 96"	18	K/2

3. Fabricate duct fittings to match adjoining ducts and to comply with duct requirements as applicable to fittings. Except as otherwise indicated, fabricate elbows with center-line radius equal to 1.5 times associated duct width. Fabricate to include single thickness turning vane in elbows where space does not permit the above radius or where square elbows are shown. Limit angular tapers to 30 degrees for contracting tapers and 20 degrees for expanding tapers. Turning vanes shall be E-Z Rail II, Durodyne, or equal.

4. Fabricate round supply connections at rectangular, plenum type fittings using spin-in type fittings, complete with extractor and volume control damper. Refer to Paragraph “DAMPERS” for damper requirements.
5. Provide drive slip or equivalent flat seams for ducts exposed in the conditioned space or where necessary due to space limitations. On ducts with flat seams, provide standard reinforcing on inside of duct. Duct connection to outlet on exposed duct shall be full size of outer perimeter of outlet flange.
6. Ducts exposed in the conditioned space shall be free of dents and blemishes and be mounted tight against adjacent surface with flat hangers. Remove all fabrication labels from ductwork.
7. Provide 20 gauge minimum for ductwork exposed within occupied spaces.

H. Rectangular Internally Insulated Duct Fabrication:
1. Provide internal duct lining where indicated on the Drawings, with a minimum of 10'-0" length in each direction from the fan, fan casing, or unit casing. Line all transfer ducts.
   a. Where ductwork is exposed to weather or outside the building insulation envelope, provide 2 inch thick, 1-1/2 pound density internal lining with matte facing, with an R-Value of 8.0 minimum.
   b. Where ductwork is within the building insulation envelope, lining shall be 1” thick, 1-1/2 pound density, with R-value of 4.2 minimum.
   c. Ducts exposed in the conditioned space shall be free of dents and blemishes and be mounted tight against adjacent surface with flat hangers. Remove all fabrication labels from ductwork.
   d. Where installed exposed in the conditioned space, duct shall be minimum 20 gauge with 1 inch insulation layer (minimum R-value – R-4.2).
   e. Cement duct liner in place with nonflammable, non-hardening duct adhesive. Seal all raw edges of insulation inside ductwork with adhesive, including longitudinal liner edges.
   f. Provide metal nosing at all locations where liner is preceded by unlined metal.
   g. Provide sheet metal weld pins and washers or clinch pins and washers on all ductwork on 12 inch intervals with the first row within 3 inches of the leading edge of each piece of insulation and within 4 inches of corners. No use of adhesive mounted pins will be considered.
      1) Install clinched pin fasteners with properly adjusted automatic fastening equipment. Manual installation will not be considered.
      2) Install weld pins with properly adjusted automatic fastening equipment. Installation shall not damage the galvanized coating on the outside of the duct.
   h. All ductwork, adhesives, lining, sealant, flex duct and the like shall have a flame spread of 25 or less and developed smoke rating of 50 or less when tested in accordance with one of the following test methods: NFPA 255, ASTM E84, or UL 723.
   i. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or equal:

Manufacturer:	Product:
Johns Manville	Linacoustic RC
CertainTeed Corporation	ToughGard
Fosters Adhesive	85-62
Swifts Adhesive	7336

I. Round and Oval Ductwork Fabrication:
1. Round and oval duct and fittings shall be spiral lockseam or longitudinal seam as indicated in table below. Provide couplings to join each length of duct.
   a. At contractors' option, round or oval ductwork may be utilized in place of rectangular ductwork shown on Drawings, provided available space allows installation of round or oval ductwork without compromising space required for installation of products and systems of other trades.
      1) Round or oval ductwork utilized in place of rectangular ductwork shown on Drawings shall be sized to have a static pressure loss equivalent to rectangular duct shown on Drawings.
      2) Unlined round or oval duct shall not be utilized in place of rectangular internally lined ductwork shown on Drawings.
2. Fabricate duct fittings to match adjoining ducts and to comply with duct requirements as applicable to fittings. Except as otherwise indicated, fabricate elbows with center-line radius equal to 1.5 times associated duct width. Provide two-piece, die-stamped, 45-degree to 90-degree elbows for sizes up to 12 inches; five-piece, 90-degree elbows for sizes 12 inches and above; conical tees; and conical laterals. All reducers shall be placed after a tap has been made on the duct main. Reducers shall be long-taper style.
3. Round Ductwork: Construct of galvanized sheet steel complying with ANSI/ASTM A 653 by the following methods and in minimum gauges listed.

Diameter	Minimum Gauge	Method of Manufacture
Up to 14"	26	Spiral Lockseam
15" to 23"	24	Spiral Lockseam
24" to 36"	22	Spiral Lockseam
37" to 50"	20	Spiral Lockseam
51" to 60"	18	Spiral Lockseam
Over 60"	14	Longitudinal Seam

4. Provide locked seams for spiral duct; fusion welded butt seam for longitudinal seam duct.

5. Fittings and Couplings: Construct of minimum gauges listed. Provide continuous welds along seams at exposed ducts. Provide spot weld bonded seams at concealed ducts.

Diameter	Minimum Gauge
3" to 36"	20
38" to 50"	18
Over 50"	16

6. Ducts exposed in the conditioned space shall be free of dents and blemishes and be mounted tight against adjacent surface with flat hangers. Remove all fabrication labels from ductwork.
7. Provide 20 gauge minimum for ductwork exposed within occupied spaces.

J. Round Internally Insulated Duct and Fittings: Where ductwork is exposed to weather or outside the building insulation envelope, construct with outer pressure shell, 2 inch thick (Minimum R-value = R-8) insulation layer, and perforated inner liner. Where ductwork is within the building insulation envelope, construct with outer pressure shell, 1 inch thick (minimum R-value = R4.2) insulation layer, and perforated inner liner. Construct shell and liner of galvanized sheet steel complying with ANSI/ASTM A 653, of spiral lockseam construction (use longitudinal seam for over 59 inches), in minimum gauges listed in table below. Where installed exposed in the conditioned space: duct and fitting outer pressure shell shall be minimum 20 gauge with 1 inch insulation layer (minimum R-value = R-4.2), and perforated inner liner.

Nominal Duct Diameter	Outer Shell	Inner Liner
3" TO 12"	26 gauge	24 gauge
13" TO 24"	24 gauge	24 gauge
25" to 34"	22 gauge	24 gauge
35" to 48"	20 gauge	24 gauge
49" to 58"	18 gauge	24 gauge
Over 59"	16 gauge	20 gauge

1. Fittings and Couplings: Construct of minimum gauges listed. Provide continuous weld along seams of outer shell at exposed ducts. Provide spot weld bonded seams at concealed ducts.

Nominal Duct Diameter	Outer Shell	Inner Liner
3" to 34"	20 gauge	24 gauge
36" to 48"	18 gauge	24 gauge
Over 48"	16 gauge	24 gauge

2. Inner Liner: Perforate with 3/32 inch holes for 22 percent open area. Provide metal spacers welded in position to maintain spacing and concentricity.
3. Ducts exposed in the conditioned space shall be free of dents and blemishes and be mounted tight against adjacent surface with flat hangers. Remove all fabrication labels from ductwork.
4. Where installed exposed in the conditioned space, duct shall be minimum 20 gauge with 1 inch insulation layer (minimum R-value – R-4.2).
5. All ductwork, adhesives, lining, sealant, flex duct and the like shall have a flame spread of 25 or less and developed smoke rating of 50 or less when tested in accordance with one of the following test methods: NFPA 255, ASTM E84, or UL 723.
6. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or equal:
   a. Sheet Metal Div., McGill AirFlow, LLC., Acousti-k27
   b. Semco Duct and Acoustical Products, Inc.
   c. Air Systems Manufacturing, Inc. - Las Vegas

K. Duct Access Doors:
1. Duct Access: Provide hinged access door in rectangular ducts for access to fire dampers, control equipment, etc. Access door size shall be duct diameter wide by duct diameter high for all ducts under 24 inches. Ducts over 24 inches in diameter shall have 24-inch by 18-inch access doors. Minimum size access doors shall be 6 inches by 6 inches.
2. Provide hinged style access doors for round ductwork, NCA Manufacturing, Inc., Model AD-RD-87, Pottorff Series 60, or equal. Access doors shall be 16 gauge galvanized steel with continuous piano hinge. Locks shall be plated steel strike and catch. Provide 1" x 3/8" Polyethylene "Perma Stik" gasket all around door.
3. Duct Access Panels:
   a. Provide duct access panel assembly of the same material and gauge used for the duct. Duct access panels shall conform to the following:
      1) Fasteners: Black steel or stainless steel to match material used for the duct. Panel fasteners shall not penetrate duct wall.
      2) Gasket: Comply with NFPA 96, grease-tight, high temperature ceramic fiber, rated for minimum 1500 °F.

2.12 PIPE JOINING MATERIALS

A. Refer to Division 22 and 23 piping sections for special joining materials not listed below.

B. Brazing Filler Metals:
1. General Duty: AWS A5.8, BCup-5 Series, copper-phosphorus unless otherwise indicated. Sil-Fos 15, or equal.
2. Refrigerant Piping:
   a. Joining copper to copper: AWS A5.8, BCup-5 Series, copper-phosphorus unless otherwise indicated. Sil-Fos 15, or equal.
   b. Joining copper to bronze or steel: AWS A5.8, Bag-1, silver alloy unless otherwise indicated.

2.13 INSULATION MATERIALS

A. General:
1. Insulation products, including insulation, insulation facings, jackets, adhesives, sealants and coatings shall not contain polybrominated diphenyl ethers (PBDEs) in penta, octa, or deca formulations in amounts greater than 0.1 percent (by mass).
2. Products shall not contain asbestos, lead, mercury, or mercury compounds.
3. 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.
4. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.
5. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.
6. Test insulation, jackets and lap-seal adhesives as a composite product and confirm flame spread of not more than 25 and a smoke developed rating of not more than 50 when tested in accordance with UL723 or ASTM E84.
7. Adhesives and sealants shall comply with testing and product requirements of South Coast Air Quality Management District, Rule 1168.

B. Insulation Materials:
1. Mineral-Fiber, Preformed Pipe Insulation:
a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or equal:
1) Johns Manville; a Berkshire Hathaway company.
2) Knauf Insulation.
3) Manson Insulation Inc.
4) Owens Corning.
b. 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-SSL.

C. Vapor-Barrier Mastic: Water based; suitable for indoor use on below-ambient services.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or equal:
a. Design Polymerics.
b. Foster Brand; H. B. Fuller Construction Products.
c. Knauf Insulation.
2. Water-Vapor Permeance: Comply with ASTM E96/E96M or ASTM F1249.
3. Service Temperature Range: 0 to plus 180 deg F.
4. Color: White.

D. Vapor-Barrier Mastic: Solvent based; suitable for outdoor use on below-ambient services.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or equal:
a. Design Polymerics.
b. Childers Brand; H. B. Fuller Construction Products.
c. Foster Brand; H. B. Fuller Construction Products.
2. Water-Vapor Permeance: Comply with ASTM E96/E96M or ASTM F1249.
3. Service Temperature Range: Minus 50 to plus 220 deg F.
4. Color: White.

E. Breather Mastic: Water based; suitable for indoor and outdoor use on above-ambient services.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or equal:
a. Design Polymerics.
b. Childers Brand; H. B. Fuller Construction Products.

c. Foster Brand; H. B. Fuller Construction Products.
d. Knauf Insulation.
2. Water-Vapor Permeance: ASTM F 1249, 1.8 perms at 0.0625-inch dry film thickness.
3. Service Temperature Range: 0 to plus 180 deg F.
4. Color: White.

2.14 TEMPERATURE CONTROL SYSTEM

A. Refer to Section 230923, Direct Digital Control System for HVAC.

PART 3 - EXECUTION

3.1 ROOF MOUNTED EQUIPMENT INSTALLATION

A. Mount and anchor equipment in strict compliance with Drawings details. Alternate anchorage methods will not be considered for roof mounted equipment.

B. Examine rough-in for roof mounted equipment to verify actual locations of piping and duct connections prior to final equipment installation.

C. Verify that piping to be installed adjacent to roof mounted equipment allows service and maintenance.

D. Verify that gas piping will be installed with sufficient clearance for burner removal and service.

E. Install ducts to termination at top of roof curb and install heavy duty rubber gaskets on supply and return openings and on full perimeter of curb, or as required for an airtight installation, prior to setting unit on curb.

F. Cover roof inside each roof mounted air conditioning unit, heat pump unit, and heating and ventilating unit roof curb with 2 inch thick, 3 pound density fiberglass insulation board.

G. Connect supply and return air ducts to horizontal discharge roof mounted equipment with flexible duct connectors. Provide G 90 galvanized steel weather hood over flexible connections exposed to the weather. Weather hood minimum gauge shall be per PART 2 article, Ductwork, Table A.

H. Remove roof decking only as required for passage of ducts. Do not cut out decking under entire roof curb.

3.2 SPLIT SYSTEM AC, HEAT PUMP, AND VRF SYSTEMS INSTALLATION

A. General:
1. Install units level and plumb.
2. Install evaporator-fan components as detailed on Drawings.
3. Install ground or roof- mounted condensing units as detailed on Drawings.
4. Install seismic restraints as required by applicable codes. Refer to Article, Submittals, in Section 230050, Basic HVAC Materials and Methods, for delegated design requirements for seismic restraints.
5. Install and connect refrigerant piping as detailed in unit manufacturers' literature. Install piping to allow access to unit.
6. Install cooling coil condensate primary drain pan piping, and overflow, if provided, and run to nearest code-compliant receptacle, or as indicated on Drawings. Install secondary drain pan for units installed over permanent and suspended-tile ceilings. Install secondary drain

pan piping and terminate 1/2 inch below ceiling, with escutcheon, in a readily visible location or as shown on Drawings.

7. Install air filters at each indoor unit. Install washable, permanent filters at indoor units designed to accept washable, permanent filters. Refer to Drawings schedule, and Article, Air Filters, in this Section, for filter requirements for ducted, above-ceiling units incorporating mixing boxes.
8. Duct Connections: Duct installation requirements are specified in Article, Ductwork, in this Section. Drawings indicate the general arrangement of ducts. Connect supply and return ducts to split-system air-conditioning units with flexible duct connectors. Flexible duct connectors are specified in Article, Ductwork, in this Section.

3.3 REFRIGERANT PIPING INSTALLATION

A. General:
1. Install refrigerant piping according to ASHRAE 15. Install and connect refrigerant piping as detailed in unit manufacturers' literature. Install piping to allow access to unit.
2. Install piping straight and free of kinks, restrictions or traps.
3. Install piping as short and direct as possible, with a minimum number of joints, elbows, and fittings.
4. Slope horizontal suction piping 1 inch/10 feet towards compressor.
5. Install fittings for changes in direction and branch connections.
6. Piping under raised floors shall be kept 6 inches minimum above ground; excavate as necessary.
7. Install locking caps on refrigerant access valves located outside building, including valves located on roofs.
8. Insulate refrigerant piping, including liquid and hot gas pipes when required by system manufacturer, and including headers, branches, and other components as detailed in unit manufacturers' literature.

B. Factory Pre-charged and sealed line set piping:
1. Keep the entire system clean and dry during installation.
2. All tubing shall be evacuated and sealed at the factory. The seal must not be broken until ready for assembly.
3. If there is any evidence of dust, moisture, or corrosion, the tubing must be cleaned out by drawing a swab soaked with methyl alcohol through the tubing as many times as necessary to thoroughly clean the tubing.
4. Where line set piping is used, enclose in iron or steel piping and fittings or in EMT conduit.

C. Field Assembled Refrigerant Piping:
1. Select system components with pressure rating equal to or greater than system operating pressure.
2. Where subject to mechanical injury, enclose refrigerant piping in EMT conduit.
3. Where field assembled refrigerant piping is exposed mounted at grade, on walls, and on roof, enclose in 16 gage galvanized steel enclosure.
4. When brazing, remove solenoid valve coils and sight glasses, also remove valve stems, seats, and packing, and accessible internal parts of refrigerant specialties. Do not apply heat near expansion-valve bulb.

3.4 TEMPORARY FILTERS

A. Provide temporary filters for fans that are operated during construction; after construction dirt has been removed from the building install new filters at no additional cost to the Owner. In addition to temporary filters at filter location, provide temporary filters on all duct openings which will operate under a negative pressure.

1. Filters used for temporary operation shall be the same as permanent filters for the application. Filters used for duct openings may be 1 inch thick pleated media disposable type.

3.5 DAMPER INSTALLATION

A. All dampers automatically controlled by damper motors are specified under "Temperature Control System" except those specified with items of equipment.

B. Provide opposed blade manual air dampers at each branch duct connection and at locations indicated on the drawings and where necessary to control air flow for balancing system. Provide an opposed blade balancing damper in each zone supply duct. Provide an access panel or Ventlok flush type damper regulator on ceiling or wall for each concealed damper.

C. Install fusible link fire dampers full size of duct at points where shown or required.

D. Provide 18 inch x 12 inch minimum hinged access doors in ductwork and furring for easy access to each fire damper; insulated access doors in insulated ducts. Label access doors with 1/2 inch high red letters.
   1. Provide Ventlok Series 100, Durodyne, or equal access doors with hardware for convenient access to all automatic dampers and other components of the system, insulated type in insulated ducts. Provide Ventlok #202 for light duty up to 2 inch thick doors, #260 heavy-duty up to 2 inch thick doors and #310 heavy-duty for greater than 2 inch thick doors. Provide #260 hinges on all hinged and personnel access doors; include gasketing.

3.6 DUCTWORK INSTALLATION

A. General:
   1. Assemble and install ductwork in accordance with recognized industry practices which will achieve air tight and noiseless (no objectionable noise) systems capable of performing each indicated service. Install each run with minimum of joints. Align ductwork accurately at connections within 1/8 inch misalignment tolerance and with internal surfaces smooth. Support ducts rigidly with suitable ties, braces, hangers, and anchors of type which will hold ducts true to shape and to prevent buckling. Where possible, install ductwork to clear construction by 1/4 inch minimum, except at air inlets and outlets. Where ductwork will not clear construction, secure duct firmly to eliminate noise in the system.
   2. Duct Joints: Install duct sealers, pop rivets or sheet metal screws at each fitting and joint. Duct sealers shall be fire retardant. Sheet metal screws for joints shall be minimum #10 size galvanized.
   3. Where ductwork is left exposed within a room, the same shall be run true to plumb, horizontal, or intended planes. Where possible, uniform margins are to be maintained between parallel lines and/or adjacent wall, floor, or ceiling surfaces.
   4. Horizontal runs of ductwork suspended from ceilings shall provide for a maximum headroom clearance. The clearance shall not be less than 6'-6" without written approval from the Architect.
   5. Provide sheet metal angle frame at all duct penetrations to wall, floor, roof, or ceiling.
   6. Paint inside of ducts, visible through grille, dull black.
   7. Where ductwork is installed in finished areas of buildings that do not have ceilings, paint ductwork, support hangers, and air inlets and outlets to match adjacent architectural surfaces, or as directed by Architect.
   8. At the time of rough installation, or during storage on the construction site and until final startup of the heating and cooling equipment, duct and other related air distribution component openings shall be covered with tape, plastic, sheet metal, or other methods acceptable to the enforcing agency.

B. Firestopping:
1. Pack the annular space between duct openings and ducts penetrating floors and walls with UL listed fire stop, and sealed at the ends. All pipe penetrations shall be UL listed, Hilti, 3M Pro-Set, or equal.
   a. Install fire caulking behind mechanical services installed within fire rated walls, to maintain continuous rating of wall construction.
2. Firestopping systems to be installed in strict accordance with manufacturer's instructions.
3. Alternate firestopping systems are acceptable if approved equal. However, any deviation from the above specification requires the Contractor to be responsible for determining the suitability of the proposed products and their intended use, and the Contractor shall assume all risks and liabilities whatsoever in connection therewith.

C. Flashing:
1. The work of this section shall include furnishing, layout, sizing, and coordination of penetrations required for the mechanical work.
2. Refer to Division 07 specifications and Drawings details as applicable.
3. Flashing for penetrations of roof for mechanical items such as flues and ducts shall be coordinated with the roofing manufacturer and roofing installer for the specific roofing type. The work of this section shall include furnishing, layout, sizing, and coordination of penetrations required for the mechanical work.
   a. Furnish and install flashing and counterflashing in strict conformance with the requirements of the roofing manufacturer. Submit shop drawing details for review prior to installation.
   b. Flues and ducts shall have 24 gauge galvanized sheet metal storm collar securely clamped to the flue above the flashing.

D. Upper connection of support to wood structure shall be with wood screws or lag screws in shear fastened in the upper one half of the wood structural member. Fasteners shall conform to the following schedule:

For ducts with P/2=30"	#10 x 1-1/2" wood screw
For ducts with P/2=72"	1/4"x 1-1/2" lag screw
For ducts with P/2 over 73"	3/8"x 1-1/2" lag screw

E. Upper connection in tension to wood shall not be used unless absolutely necessary. Where deemed necessary the contractor shall submit calculations to show the size fastener and penetration required to support loads in tension from wood in accordance with the following schedule:

For ducts with P/2=30"	260 pounds per hanger
For ducts with P/2=72"	320 pounds per hanger
For ducts with P/2=96"	460 pounds per hanger
For duct with P/2 larger than 120"	NOT ALLOWED

F. Where ducts pass through interior partitions and exterior walls, conceal space between construction opening and duct or duct plus insulation with sheet metal flanges of same gauge as duct. Overlap opening on four sides by at least 1-1/2 inches.

G. Support ductwork in manner complying with SMACNA "HVAC Duct Construction Standards," hangers and supports sections. Where special hanging of ductwork is detailed or shown on Drawings, Drawings shall be followed. Angles shall be attached to overhead construction in a manner so as to allow a minimum of 2 inches of movement in all directions with no bending or sagging of the angle.
   1. Except where modified in individual paragraphs of this Section, provide hanger support with minimum 18 gauge straps, 1 inch wide. Fold duct strap over at bottom of duct.
   2. Install duct supports to rectangular ducts with sheet metal screws. Provide one screw at top of duct and one screw into strap at bottom of duct.

3.7 PIPING INSTALLATION

A. General:
   1. All piping shall be concealed unless shown or otherwise directed. Allow sufficient space for ceiling panel removal.
   2. Installation of piping shall be made with appropriate fittings. Bending of piping will not be accepted.
   3. Install piping to permit application of insulation and to allow valve servicing.
   4. Where piping or conduit is left exposed within a room, the same shall be run true to plumb, horizontal, or intended planes. Where possible, uniform margins are to be maintained between parallel lines and/or adjacent wall, floor, or ceiling surfaces.
   5. Horizontal runs of pipes and conduits suspended from ceilings shall provide for a maximum headroom clearance. The clearance shall not be less than 6'-6" without written approval from the Architect.
   6. Close ends of pipe immediately after installation. Leave closure in place until removal is necessary for completion of installation.
   7. Use reducing fittings; bushings shall not be allowed. Use eccentric reducing fittings wherever necessary to provide free drainage of lines and passage of air.
   8. Verify final equipment and fixture locations for roughing-in.
   9. Where piping is installed in walls within one inch of the face of stud, provide a 16 gauge sheet metal shield plate on the face of the stud. The shield plate shall extend a minimum of 1-1/2 inches beyond the outside diameter of the pipe.
   10. Each piping system shall be thoroughly flushed and proved clean before connection to equipment.
   11. Install exposed polished or enameled connections with special care showing no tool marks or threads at fittings.
   12. Service Markers: Mark the location of each plugged or capped pipe with a 4 inch round by 30 inch long concrete marker, set flush with finish grade. Provide 2-1/2 inch diameter engraved brass plate as part of monument marker.
   13. Pipe the discharge of each relief valve, air vent, backflow preventer, and similar device to floor sink or drain.

B. Sleeves:
   1. Install Adjus-to-Crete, Pipeline Seal and Insulator, or equal, pipe sleeves of sufficient size to allow for free motion of pipe, 24 gauge galvanized steel. The space between pipe and sleeves through floor slabs on ground, through outside walls above or below grade, through roof, and other locations as directed shall be caulked with oakum and mastic and made watertight. The space between pipe and sleeve and between sleeve and slab or wall shall be sealed watertight.
   2. At Contractor's option, Link-Seal, Metraflex Metraseal, or equal, casing seals may be used in lieu of caulking. Wrap pipes through slabs on grade with 1 inch thick fiberglass insulation to completely isolate the pipe from the concrete.

C. Floor, Wall, and Ceiling Plates:

1. Fit all pipes with or without insulation passing through walls, floors, or ceilings, and all hanger rods penetrating finished ceilings with chrome-plated or stainless escutcheon plates.

D. Firestopping:
1. Pack the annular space between pipe sleeves and pipes penetrating floors and walls with UL listed fire stop, and sealed at the ends. All pipe penetrations shall be UL listed, Hilti, 3M Pro-Set, or equal.
   a. Install fire caulking behind mechanical services installed within fire rated walls, to maintain continuous rating of wall construction.
2. Provide SpecSeal Systems UL fire rated sleeve/coupling penetrators for each pipe penetration or fixture opening passing through floors, walls, partitions or floor/ceiling assemblies. All Penetrators shall comply with UL Fire Resistance Directory (Latest Edition), and in accordance with CBC requirements.
3. Sleeve penetrators shall have a built in anchor ring for waterproofing and anchoring into concrete pours or use the special fit cored hole penetrator for cored holes.
4. Copper and steel piping shall have SpecSeal, or equal, plugs on both sides of the penetrator to reduce noise and to provide waterproofing.
5. Firestopping systems to be installed in strict accordance with manufacturer's instructions.
6. Alternate firestopping systems are acceptable if approved equal. However, any deviation from the above specification requires the Contractor to be responsible for determining the suitability of the proposed products and their intended use, and the Contractor shall assume all risks and liabilities whatsoever in connection therewith.

E. Flashing:
1. The work of this section shall include furnishing, layout, sizing, and coordination of penetrations required for the mechanical work.
2. Refer to Division 07 specifications and Drawings details as applicable.
3. Flashing for penetrations of metal or membrane roof for pipes shall be coordinated with the roofing manufacturer and roofing installer for the specific roofing type.
   a. Furnish and install flashing and counterflashing in strict conformance with the requirements of the roofing manufacturer. Submit shop drawing details for review prior to installation.
   b. Furnish and install counterflashing above each flashing required. Provide Stoneman, or equal, vandalproof top and flashing combination. Elmdor/Stoneman Model 1540.
4. Furnish and install flashing and counterflashing in strict conformance with the requirements of the roofing manufacturer. Submit shop drawing details for review prior to installation.

3.8 PIPE JOINTS AND CONNECTIONS

A. General:
1. Cutting: Cut pipe and tubing square, remove rough edges or burrs. Bevel plain ends of steel pipe.
2. Remove scale, slag, dirt and debris from inside and outside of pipe before assembly.
3. Boss or saddle type fittings or mechanically extracted tube joints will not be allowed.

B. Copper Pipe and Tubing: All joints shall be brazed according to ASME Section IX, Welding and Brazing Qualifications, except pneumatic control piping, and hydronic piping having grooved-end fittings and couplings.

C. Flexible Connections:
1. Furnish and install Thermo Tech., Inc. F/J/R, Metraflex, or equal, flexible couplings with limiter bolts on piping connections to all equipment mounted on anti-vibration bases, except

fan coil units under 2000 cfm, on each connection to each base mounted pump and where shown. Couplings shall be suitable for pressure and type of service.
2. Flexible connections in refrigerant lines; Flexonic, Anaconda or equal, metal hose, full size.
3. Anchor piping securely on the system side of each flexible connection.

3.9 HANGER AND SUPPORT INSTALLATION

A. General: Support ductwork, equipment and piping so that it is firmly held in place by approved iron hangers and supports, and special hangers. Hanger and support components shall support weight of ductwork, equipment and pipe, fluid, and pipe insulation based on spacing between supports with minimum factor of safety of five based on ultimate strength of material used. Do not exceed manufacturer's load rating. Pipe attachments or hangers, of same size as pipe or tubing on which used, or nearest available. Rigidly fasten hose faucets, fixture stops, compressed air outlets, and similar items to the building construction. The Architect shall approve hanger material before installation. Where building structural members do not match piping and ductwork support spacing, provide “bridging” support members firmly attached to building structural members in a fashion approved by the structural engineer.
   1. Materials, design, and type numbers for support of piping per Manufacturers' Standardization Society (MSS), Standard Practice (SP)-58.
      a. Provide copper-plated or felt-lined hangers for use on uninsulated copper tubing.
   2. Materials and design for ductwork support shall be per SMACNA “HVAC Duct Construction Standards, Metal and Flexible.”

B. Hanger components shall be provided by one manufacturer: B-Line, Grinnell, Unistrut, Badger, or equal.

3.10 INSULATION AND FIELD-APPLIED JACKET INSTALLATION

A. General:
   1. The term "piping" used herein includes pipe, air separators, valves, strainers and fittings.
   2. Clean thoroughly, test and have approved, all piping and equipment before installing insulation and/or covering.
   3. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of piping, ductwork, and equipment.
   4. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of equipment as specified in insulation system schedules.
   5. 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.
   6. Install insulation with longitudinal seams at top and bottom of horizontal runs.
   7. Install multiple layers of insulation with longitudinal and end seams staggered.
   8. Keep insulation materials dry during application and finishing.
   9. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.
   10. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.
   11. Install insulation in removable segments on equipment access doors, manholes, handholes, and other elements that require frequent removal for service and inspection. Bevel and seal insulation ends around manholes, handholes, ASME stamps, and nameplates.
   12. For piping, ductwork, and equipment, with surface temperatures below ambient, apply mastic to open ends, joints, seams, breaks, and punctures in insulation.
   13. Repair all damage to existing pipe, duct and equipment insulation whether or not caused during the work of this contract, to match existing adjacent insulation for thickness and finish, but conforming to flame spread and smoke ratings specified above.

14. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.
    a. Install insulation continuously through hangers and around anchor attachments.
    b. 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.
    c. 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.
    d. Cover inserts with jacket material matching adjacent insulation. Install shields over jacket, arranged to protect jacket from tear or puncture by hanger, support, and shield.

B. Piping Insulation Installation:
1. General:
    a. Apply insulating cement to fittings, valves and strainers and trowel smooth to the thickness of adjacent covering. Cover with jacket to match piping. Extend covering on valves up to the bonnet. Leave strainer cleanout plugs accessible.
    b. Provide removable insulation covers for items requiring periodic service or inspection.
    c. Insulation shall be vapor tight before applying PVC jacket and fitting covers. Verify suitability with manufacturer of insulation.
    d. Provide pre-formed PVC valve and fitting covers for indoor piping.
    e. Provide factory-fabricated aluminum valve and fitting covers for outdoor piping.
    f. Provide Calcium Silicate rigid insulation and sheet metal sleeve, 18 inch minimum length at each pipe hanger. Seal ends of insulation to make vapor tight with jacket.
2. Aluminum Jacket Installation:
    a. Where insulated piping is exposed to the weather apply aluminum jacket secured with 1/2 inch stainless-steel bands on 12 inch centers. Install jacketing 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. Cover fittings with glass cloth, two coats of Foster Sealfas 30-36, and factory-fabricated aluminum fitting covers, of same material, finish, and thickness as jacket. Insulation shall be vapor tight before applying metal jacket and fitting covers.
    b. Do not install aluminum jackets on refrigerant flexible connectors to vibration isolated outdoor condensing units. Coat elastomeric insulation with insulation manufacturer’s recommended ultraviolet light protective coating.

3.11 TEMPERATURE CONTROL SYSTEM INSTALLATION

A. Provide thermostats where indicated on drawings. All wiring shall be in conduit. Provide all relays, transformers and the like to render the control system complete and fully operable. All control conduit to be rigid steel type.

3.12 EQUIPMENT START-UP

A. Initial start-up of the systems and pumps shall be under the direct supervision of the Contractor.

B. Equipment start-up shall not be performed until the piping systems have been flushed and treated and the initial water flow balance has been completed.

C. It shall be the responsibility of the Contractor to assemble and supervise a start-up team consisting of controls contractor, start-up technician, and test and balance contractor; all to work

in concert to assure that the systems are started, balanced, and operate in accordance with the design.

D. After start-up is complete, instruct the Owner's personnel in the operation and maintenance of the systems. Obtain from the Owner's representative a signed memo certifying that instruction has been received.

E. For additional requirements, refer to article, Check, Test and Start Requirements, in Section 230050, Basic HVAC Materials and Methods.

3.13 TESTING AND BALANCING

A. For testing and balancing requirements, refer to Section 230593, Testing and Balancing for HVAC.

3.14 CLEANING AND PROTECTION

A. As each duct section is installed, clean interior of ductwork of dust and debris. Clean external surfaces of foreign substances that might cause corrosive deterioration of metal or where ductwork is to be painted.

B. Temporary Closure: At ends of ducts that are not connected to equipment or air distribution devices at time of ductwork installation, provide temporary closure of polyethylene film or other covering that will prevent entrance of dust and debris until connections are to be completed.

C. As each internally lined duct section is installed, check internal lining for small cuts, tears, or abrasions. Repair all damage with fire retardant adhesive.

3.15 EQUIPMENT MOUNTING

A. Mount and anchor equipment in strict compliance with Drawings details. Alternate anchorage methods will not be considered for roof mounted equipment.

3.16 OUTDOOR, ABOVEGROUND PIPING INSULATION SCHEDULE

A. Refrigerant Suction and Hot-Gas Piping, Cooling-Only Systems:
   1. All Pipe Sizes: Insulation shall be one of the following:
      a. Flexible Elastomeric: 1 inch thick.
      b. Mineral-Fiber, Preformed Pipe: 1 inch thick.

B. Refrigerant Vapor and Liquid Piping, Heat Pump Systems:
   1. Vapor piping for heat pump applications smaller than 1-1/2 inches diameter:
      a. Flexible Elastomeric: 1-1/2 inches thick.
      b. Mineral-Fiber, Preformed Pipe: 1-1/2 inches thick.
   2. Vapor piping for heat pump applications 1-1/2 inches diameter and larger:
      a. Flexible Elastomeric: 2 inches thick.
      b. Mineral-Fiber, Preformed Pipe: 2 inches thick.
   3. Liquid piping for heat pump applications smaller than 1 inch diameter:
      a. Flexible Elastomeric: 1 inch thick.
      b. Mineral-Fiber, Preformed Pipe: 1 inch thick.

C. Refrigerant Flexible Connectors:
   1. Flexible Elastomeric: Thicknesses as specified for rigid piping.

3.17 OUTDOOR FIELD-APPLIED PIPING JACKET SCHEDULE

A. All Piping: Aluminum, Stucco Embossed: Thickness as follows:

Outer Insulation Diameter (Inches)	Minimum Aluminum Jacket Thickness (Inch)	
	Rigid Insulation	Non-Rigid Insulation (Note 1)
8 and Smaller	0.024	0.024
Larger Than 8 Thru 11	0.024	0.024
Larger Than 11 Thru 24	0.024	0.024
Larger Than 24 Thru 36	0.024	0.032
Larger Than 36	0.024	0.040

1. Note 1: Non-rigid Insulation is defined as having a compressive strength of less than 15 psi.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes equipment and performance criteria for furnishing all labor and materials for the installation and programming for Energy Management System for HVAC Systems utilizing wireless communication with cloud based servers.

1.2 RELATED SECTIONS

A. Section 23: Heating, Ventilating, and Air-Conditioning (HVAC)

1.3 SUBMITTALS

A. Shop Drawings and product data in accordance with the specifications.

B. All shop drawings shall be prepared in AutoCAD 2000 or newer. In addition, Contractor shall provide drawings in electronic format with x-ref and layer information to other trades as required.

C. All submittals shall be bound or in a three-ring binder with a table of contents and related section tabs. Five (5) copies shall be submitted to the Architect or engineer for distribution and review.

D. Shop drawings shall include basic floor plans depicting locations of all equipment and wiring, installed by others, to be controlled by system and locations of thermostats, gateways and other equipment provided under this section. Drawings shall also show location of electrical power, low voltage wiring and data ports, provided by others, required for proper installation of systems of this section.

E. Submittal data shall contain manufacturer's data on all hardware and software products required by the specification.

F. Submit five (5) copies of submittal data and shop drawings to the Engineer for review prior to ordering or fabrication of the equipment. The Contractor prior to submitting shall check all documents for accuracy.

G. The Engineer will make corrections, if required, and return to the Contractor. The Contractor will then resubmit with the corrected or additional data. This procedure shall be repeated until all corrections are made to the satisfaction of the Engineer and the submittals are fully approved.

1.4 SCOPE OF WORK

A. Except as otherwise noted, the control system shall consist of all thermostats, and gateways to fill the intent of the specification and provide for a complete and operable system.

B. The EMS contractor shall review and study existing building/site conditions where applicable and all new construction drawings for the project including HVAC drawings and the entire project specifications to familiarize themselves with the equipment and system operation prior to prior to bidding and submittal of a bid/price and notify the owner immediately of any conflicts between the project and the scope of work of this section, including work to be completed by others.

C. All equipment and installation of control devices associated with the equipment listed below shall be provided under this Contractor.

D. When the EMS system is fully installed and operational, the EMS Contractor will make themselves available to meet with the designated representatives of the owner to review the as-installed condition of the system. At that time, the EMS contractor shall demonstrate the operation of the system and prove that it complies with the intent of the drawings and specifications.

E. The Contractor shall furnish and install a complete EMS control system including all necessary hardware and all operating and applications software necessary to perform the control sequences of operation as called for in this specification. Provide and Install EMS controls for the HVAC Equipment as noted on the drawings:

F. Provide technical support necessary for commissioning of system in coordination with the HVAC Contractor, Balancing Contractor and the owner's team.

G. Contractor shall provide one training session in the operation of the system, for owner's personnel.

H. All work performed under this section of the specifications will be in compliance with all codes and regulations as mandated by the authority having jurisdiction.

1.5 SYSTEM DESCRIPTION

A. The Energy Management System (EMS) shall consist of thermostats, gateways and related accessories as indicated below and all related programming for a complete and fully operational web based management system using a cloud server program complying with the following specifications.

B. The entire Energy Management Solution (EMS) shall include a network of commercial Internet programmable thermostats which use IEEE 802.15.4 mesh wireless communication protocol to reach a Wireless Gateway (WG). The WG must connect to the owner’s wide area network (WAN) over a TCP/IP connection. Access and control of EMS is through a web based management tool which sits on a cloud server and must be accessible either locally or remotely via the Internet.

1.6 WORK BY OTHERS

A. The EMS Contractor shall coordinate with other contractors prior to performing the work on this project and cooperate as necessary to achieve a complete and neat installation. To that end, each contractor shall consult the drawings and specifications for all trades to determine the nature and extent of others’ work prior to fabrication and installation. The owner's representative shall be immediately notified if an area of conflict occurs between trades prior to fabrication and installation. EMS Contractor shall provide field supervision to the Mechanical Contractor for pre-installation of control components.

B. Low voltage thermostat wiring between equipment and thermostat locations shall be furnished and installed by others. Unless noted otherwise all new low voltage wiring shall be multiple conductor thermostat wiring (wire count as indicated in Thermostat Manufacture's installation instructions) installed per owner's specifications. (Wiring in existing installations shall be minimum 3 conductor / 24 gauge wires per EMS manufacturer's standard specifications, multiple c conductor/24 gauge thermostat wiring preferred - see Installation Instructions for specific conductor counts depending on heating and cooling modes of existing equipment.)

C. Related work provided by others:

1. 110 V outlets shall be provided within 5 feet of each gateway location.
2. 1 Data port shall be provided within 10 feet of each gateway location.

D. Equipment start-up and servicing

1.7 CODE COMPLIANCE

A. Provide EMS components and ancillary equipment which are code compliant.

B. All wiring shall conform to the National Electrical Code.

C. All products of the EMS shall reside with the following agency approvals.
1. California 2013 Title 24 Compliant.
2. California Energy Commission Occupant Control Smart Thermostat (OCST) certified.
3. OpenADR2.0 certified.

1.8 SYSTEM STARTUP & COMMISSIONING

A. Each EMS component in the system shall be tested for both hardware and software functionality. In addition, each mechanical and electrical system under control of the EMS will be tested against the appropriate sequence of operation specified herein. Successful completion of the system test shall constitute the beginning of the warranty period. A written report will be submitted to the owner indicating that the installed system functions in accordance with the plans and specifications.

B. The EMS Contractor shall provide all manpower and engineering services required to assist the HVAC Contractor and Balancing Contractor in testing, adjusting, and balancing all systems in the building. The EMS Contractor shall have a trained technician available on request during the balancing of the systems. The EMS Contractor shall coordinate all requirements to provide a complete air balance with the Balancing Contractor and shall include all labor and materials in his contract to assist with functional testing of system as it relates to EMS.

1.9 TRAINING

A. The EMS Contractor shall provide training for two (2) owner's representatives and/or maintenance personnel. The EMS Contractor shall provide on-site training to the District’s representative(s) and maintenance personnel per the following description:

B. On-site training shall consist of a minimum of (1) hours, as indicated above of hands-on instruction geared at the operation and maintenance of the systems. The curriculum shall include:
1. System Overview
2. System Software and Operation
3. System access
4. Software features overview
5. Changing set points and other attributes
6. Scheduling
7. Editing programmed variables
8. Displaying color graphics
9. Running reports
10. Workstation maintenance
11. Application programming
12. Operational sequences including start-up, shutdown, adjusting and balancing.
13. Equipment maintenance

1.10 OPERATING AND MAINTENANCE MANUALS

A. The operation and maintenance manuals shall contain all information necessary for the operation, maintenance, replacement, installation, and parts procurement for the entire EMS. This documentation shall include specific part numbers.

B. Following project completion and testing, the EMS contractor will submit as-built documentation reflecting the exact installation of the system.

1.11 WARRANTY

A. The EMS contractor shall warrant the system for 12 months after system acceptance and beneficial use by the District. During the warranty period, the EMS contractor shall be responsible for all necessary revisions to the software as required to provide a complete and workable system consistent with the letter and intent of the Sequence of Operation section of the specification. EMS equipment shall be warranted for a period of 5 years from the time of system acceptance.

B. Warranty of equipment is limited to replacement of defective products.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Unless noted otherwise, all products shall be of a single manufacturer. The standard of design and quality shall be products as manufactured by Pelican Wireless Systems,

B. Products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional requirements of the specified product. A request for Architect/Engineer's approval must be submitted with complete technical data to allow for proper evaluation. All materials for evaluation must be received by Project Manager at least 10 days prior to bid due date.

2.2 WIRELESS GATEWAY (WG)

A. A single WG shall be capable of providing communication between a dedicated cloud server using TCP/IP and the on-site Internet Programmable Thermostats using the IEEE 802.15.4 wireless communication protocol. Additional WGs can be used for a single site, but each WG must meet or exceed these requirements

B. The WG must provide the following hardware features as a minimum:
1. Single Ethernet Port.
2. One micro-USB 5VDC power input.
3. 2.4 GHz IEEE std. 802.15.4 built-in communication processor.

C. The WG shall provide the communication link between the entire system and a cloud based server. Communication with cloud server shall be secured using AES (Advanced Encryption Standard).

D. The WG shall be able to support 2000 Internet Programmable Thermostats.

2.3 INTERNET PROGRAMMABLE THERMOSTAT (IPT)

A. Internet Programmable Thermostat shall be a wireless communicating commercial programmable thermostat that uses IEEE 802.15.4 for networking communication and a wiring terminal block for controlling a single zone HVAC unit.

B. The IPT shall provide a keypad for setting:
1. Temperature Set points.
2. System Mode (Heat, Cool, Auto, Off).
3. Fan Mode (Auto, On).
4. Light Button.

C. The IPT shall include a wiring terminal for controlling a single zone HVAC unit. The wiring terminal must be able to be removed from the IPT for installations where only 3-wires exist or are available between where the IPT will be placed and its connection with the HVAC unit it will be controlling. Over these 3-wires the thermostat must still be able to control the HVAC unit based on these specifications.

D. The IPT must be configurable using a Web Based App. No thermostat configuration, other than setting the IPT to Conventional, Heat Pump - O, or Heat Pump -B, shall be done at the thermostat. Web based Configuration Setting options shall include:
1. Naming the thermostat
2. Grouping multiple thermostats.
3. Heat Pump or Conventional system setting.
4. If Heat Pump; reversing valve O or B setting.
5. Cycles Per Hour (1 - 6).
6. Anticipation Degrees (0˚F - 0.5˚F)
7. Calibration Degrees (2.0˚F - -2.0˚F)
8. Heat Stages (0 - 2)
9. If Heat Pump; Aux Heat (Disabled and/or Enabled Option)
10. Cool Stages (0 - 2)
11. Fan Stages (1 - 2)
12. Fan Circulation Minutes Per Hour.
13. Temperature Display (Fahrenheit or Celsius)
14. Heat Range Temperature Setting Limitation
15. Cool Range Temperature Setting Limitation
16. Ability to disable and enable Keypad Control through schedule.
17. Heat consumption (kw, btu, ton, or watt)
18. Cool consumption (kw, btu, ton, or watt)
19. Notification Sensitivity (High, Medium, Low)
20. Alarm of exceeding temperature based on a Safe Range
21. Schedule set times (2, 3, 4, or Variable).

E. IPT settings and control through the Web Base App shall be in real-time and include:
1. Space Temperature
2. System Mode (Heat, Cool, Auto, Off).
3. Fan Mode (Auto, On).
4. Current set point.
5. Relay status (Heat/Cool and Fan).
6. Historical Trend Graphs.
7. Scheduling
8. Lock and Unlock Entire Thermostat’s Keypad
9. Lock and Unlock the Thermostat’s Fan Mode setting Only

2.4 WEB BASED GRAPHICAL USER INTERFACE

A. The Web Based App (WBA) shall be able to run on any PC that uses Safari, Chrome, Firefox, or any other web browser that meets these browsers' functionality.

B. The WBA Platform shall be able to run on any Internet Accessible Smartphone and/or Tablet that has a Web Browser compatible with HTML5.

C. The WBA shall allow up to a minimum of 100 simultaneous users/clients to access the Energy Management System.

D. The Web Based client shall support at a minimum, the following functions:
1. User log-on identification and password shall be required.
2. HTML programming shall not be required to display any graphics or data on the Web page.
3. Storage of data shall reside within the cloud server and shall not sit within the client's computer or device. EMS that requires data storage on a client computer or an on-site server is not acceptable.
4. Users shall have administrator and user definable access privileges.
5. OpenAPI interface with XML data output.

E. Schedules:
1. The WBA shall provide user with access to setting Internet Programmable Thermostat (IPT) schedules. Up to 12 schedule periods per day shall be available for each IPT.
2. Schedules shall be available as Weekly (7-day), Daily, or Weekday/Weekend (5-2).
3. The WBA shall provide the user the ability to:
   a. View Schedules.
   b. Add/Modify Schedules.
   c. Assign Thermostat to a Group Schedule.
   d. Delete Schedules.

F. Trending
1. The WBA shall provide real-time trend information on:
   a. Each IPT's space temperature.
   b. Each IPT's temperature set points.
   c. Each IPT's current call; heat, cool, and/or fan.
   d. Each IEE's call for economization
2. The WBA shall be able to record and provide at least two years of past trend data for every thermostat in the wireless network. Trend data shall include:
   a. space temperature; with resolution of every 1/10th of a degree Fahrenheit.
   b. IPT's temperature set points.
   c. indication of whether the thermostat was calling for; heat, cool, and/or fan.
3. 3. Trend data shall be viewable on the WBS

G. Alarm Notifications
1. The WBA shall provide automatic alarming functionally based on real-time monitoring of at least:
   a. space temperature and temperature change.
   b. IPT's temperature set points.
   c. IPT's current call; heat, cool, and/or fan.
2. The WBA shall be able to provide a user with the ability to:
   a. View Alarms.
   b. Set Alarm Notification sensitivity level to High, Medium, or Low.
   c. Delete Alarms.
3. Alarms shall be able to be sent via email and/or text message to up to 100 or more clients.

H. Consumption Usage

1. The WBA shall be able to calculate and graphically display the consumption of running a single zone HVAC unit based on a user defined HVAC unit heat and/or cool consumption rate multiplied by the thermostat heat/cool call time.
2. The WBA shall be able to calculate and graphically display the cost of consumption of running a single zone HVAC unit based on taking a user defined HVAC unit heat and/or cool consumption and multiplying that by the client defined cost per kw and/or therm.
3. The WBA shall be able to display consumption usage for a single thermostat, multiple thermostats at a single time, or all the thermostats in the EMS.
4. The WBA shall be able to record and display up to at least two years of consumption usage information.

2.5 WIRED REMOTE TEMPERATURE SENSORS AND DIGITAL ALARM INPUT

A. Input Temperature Sensor (ITS).
   1. The ITS shall connect to the Internet Programmable Thermostat over 3-wires.
   2. ITS shall provide at least one external 10K Type II thermistor temperature sensor input.
   3. Web Based App shall be able to record and provide at least two years of past temperature data for ITS.
   4. The trend data shall be viewable on the WBA.
   5. ITS must be accurate to ±1.0℉
   6. ITS must be able to be installed up to 500’ away from IPT using standard thermostat wiring.

2.6 INTERNET ENABLED ECONOMIZER (IEE)

A. The IEE shall connect to the Internet Programmable Thermostat (ITS) with ONLY 3-wires. No additional wiring must be required between the IEE and the ITS to gain complete Title 24 compliant economization control.

B. IEE shall provide up to three 10K Type II external thermistor temperature sensor input.

C. Web Based App shall be able to record and provide at least two years of past data for IEE. Data must represent historical representations of:
   1. Calls for Economization
   2. Outside Air Damper Position
   3. Supply and Outside Air Temperature

D. The trend data shall be viewable on the WBA.

E. IEE must be able to send California Title 24 Fault and Diagnostics codes to the WBA, email addresses, and or text messages.

F. IEE must be able to be installed up to 500’ away from IPT using standard thermostat wiring.

G. IEE must have a settable 0-10VDC output for Outside Air Damper Actuator control.

H. IEE must have a settable 0-10VDC output for Variable Frequency Drive (VFD) control.
   1. IEE must be configurable for different VFD speeds based on calls for cold, heat, and ventilation.

I. IEE must have a 0-10VDC input for Outside Air Damper Position Feedback.

2.7 WIRELESS PROXIMITY SENSORS

A. Wireless Proximity Sensor (WPS).

1. The WPS shall connect with the Internet Programmable Thermostat over the 802.15.4 wireless network.
2. WPS shall be powered by 2 AA batteries or equivalent.
3. WPS must be able to be used for either:
   a. Accepting a motion sensor's 2-wire dry contact output.
      1) The WPS shall be able to notify an Internet Programmable Thermostat if a motion sensor's dry contact is in either the open or closed position.
      2) Dry contact open positions will indicate that the space is occupied and the IPT must be able to automatically setback its temperature setting by a range of 0℉ - 10℉ or OFF.
      3) Dry contact closed position will indicate that the space is unoccupied and set the temperature to a comfort setting when the space is occupied.
      4) Setback settings and comfort settings must be settable through the Internet Programmable Thermostat's schedule through the Web Based App (cannot be settable at thermostat).
      5) Web Based App must be able to display when a space is "Unoccupied".
   b. Detecting if a Window OR Door is Opened or Closed.
      1) The WPS must have a built-in magnetic sensor and come with a magnet that can be installed on a door OR window.
      2) The WPS must be able to notify an Internet Programmable Thermostat if the door is open and the IPT must automatically turn to the OFF position.
      3) The WPS must be able to notify an Internet Programmable Thermostat if the door is closed and the IPT must automatically return to its last temperature and system settings.
      4) Web Based App must be able to display when the Door OR Window is Open and must be able to be set to indicate "Door" or "Window".
   c. Web Based App shall be able to notify if the WPS batteries are low and record and provide at least two years of past history on occupancy and/or door/window status for each space a WPS is installed in.
   d. The trend data shall be viewable on the Web Based App.
   e. Internet Programmable Thermostat must be able to connect with at least 8 WPS, each WPS must have a unique serial number and each WPS shall be settable, through the Web Based App, as either a motion sensor input or as a door/window sensor.

PART 3 - EXECUTION

3.1 CONTRACTOR RESPONSIBILITIES

A. General
   1. Installation of the Energy Management System shall be performed by an approved Contractor. The Contractor shall certify all work as proper and complete. Under no circumstances shall the design, scheduling, coordination, programming, training, and warranty requirements for the project be delegated to a subcontractor without prior written approval of the owner.

B. Demolition
   1. Remove controls which do not remain as part of the Energy Management System. The Owner will inform the Contractor of any equipment which is to be removed that will remain the property of the Owner. All other equipment which is removed will be disposed of by the Contractor.

C. Access to Site

1. Unless notified otherwise, entrance to building is restricted. No one will be permitted to enter the building unless their names have been cleared with the District or the District's Representative.

D. Code Compliance
1. All wiring shall be installed in accordance with all applicable electrical codes and will comply with equipment manufacturer's recommendations.

E. Cleanup
1. At the completion of the work, all equipment pertinent to this contract shall be checked and thoroughly cleaned, and all other areas shall be cleaned around equipment provided under this contract.

3.2 WIRING, CONDUIT, AND CABLE

A. All control wires between HVAC units and thermostat locations to be furnished and installed by others. The EMS contractor shall not begin work on this contract until all wiring is installed to the satisfaction of the EMS contractor. The EMS contractor shall provide wiring between remote temperature sensors, TA1 and thermostats as required, unless noted otherwise in drawings or specifications.

3.3 HARDWARE INSTALLATION

A. Installation Practices for Devices
1. All devices are to be mounted level/plumb and per the manufacturer's installation documentation.

B. Identification
1. Identify all control wires with labeling tape or sleeves using either words, letters, or numbers that can be exactly cross-referenced with as-built drawings.
2. All field enclosures, other than controllers, shall be identified with a back lite nameplate. The lettering shall be in white against a black or blue background.
3. Junction box covers will be marked to indicate that they are a part of the EMS system.
4. All I/O field devices (except space sensors) that are not mounted within FIP's shall be identified with name plates.
5. All I/O field devices inside FIP's shall be labeled.

C. Existing Controls.
1. Existing controls are not to be reused. All EMS devices will be new.

D. Control System Switch-over
1. The Contractor shall minimize control system downtime during switch-over. Sufficient installation mechanics will be on site so that the entire switch-over can be accomplished in a reasonable time frame.

E. Location
1. The location of sensors is per mechanical and architectural drawings.
2. Space humidity or temperature sensors will be mounted away from machinery generating heat, direct light and diffuser air streams.
3. If Input Temperature Sensor(s) (ITS) is used as Outdoor air sensor, Outdoor air sensors will be mounted on the north building face directly in the outside air. Install sensors such that the effects of heat radiated from the building or sunlight is minimized.
4. If any line voltage electrical control is being installed, field enclosures shall be located immediately adjacent to the controller panel(s) to which it is being interfaced.

3.4 SYSTEM PROGRAMMING

A. General.
1. The Contractor shall provide all labor necessary to install, initialize, start-up and debug all system software as described in this section. This includes any operating system software.
2. Contractor shall work with owner's representative to determine programming parameters including but not limited to hours of operation, set points, system variables, thermostat naming, and site naming. Thermostat & Site naming shall be performed by the contractor. Naming convention (equipment # or name, or space served) shall be provided by or agreed upon with the Owner.

3.5 COMMISSIONING AND SYSTEM STARTUP

A. EMS device functional testing.
1. Each system for which an EMS device has been installed shall be tested for proper installation and functional operation. Test shall include on-site control test to verify each wireless device is responding to signals sent from cloud based servers and responding in accordance with manufacture's specifications.

END OF SECTION

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, in accordance with the provisions of Section 017700.

1.4 QUALITY ASSURANCE

A. Materials and Systems:
1. Labels: Provide materials listed and labeled by Underwriters' Laboratories or testing 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. 2019 California Building Code, Part 2, Title 24 (2018 IBC and 2019 California Amendments).

8. 2019 California Electrical Code, Part 3, Title 24 (2017 NEC and 2019 California Amendments).
9. 2019 California Mechanical Code, Part 4, Title 24 (2018 UMC and 2019 California Amendments).
10. 2019 California Plumbing Code, Part 5, Title 24, CCR (2018 UPC and 2019 California Amendments).
11. 2019 California Fire Code, Part 9, Title 24 (2018 IFC and 2019 California Amendments).
12. 2019 California Referenced Standards Code Part 12, Title 24.
13. State of California Low-Voltage Electrical Safety Orders (CAL/OSHA).
14. State of California High-Voltage Electrical Safety Orders (CAL/OSHA).

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.

1.5 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: In accordance with requirements of Section 017700, 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:
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.

E. Materials: Same as channels and angles, except metal items may be stainless steel.

F. 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.

G. Pipe Sleeves: ASTM A 53, Type E, Grade A, Schedule 40, galvanized steel, plain ends.

H. 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.

I. Expansion Anchors: Carbon-steel wedge or sleeve type.

J. Toggle Bolts: All-steel springhead type.

K. 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:
   1. Not less than 6 inches wide by 4 mils thick.
   2. Embedded continuous metallic strip or core.
   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.

1. Interior Units: Aluminum, baked-enamel-finish, punched or drilled for mechanical fasteners.
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/waterproof 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. Wood: Wood screws or screw-type nails.
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 078400 “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 312316.

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 099000.

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

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. Product Data: Submit wiring device manufacturer’s catalog information showing dimensions, configurations, and construction.

B. Manufacturer's installation instructions.

1.4 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 017300 and 017700 - 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

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 NEC. 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), and National Fire Protection Association (NFPA) codes 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.

1.7 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.

1.8 WORK PERFORMANCE

A. All electrical work shall comply with requirements of the latest NFPA 70 (NEC and 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 010000, 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 010000, GENERAL REQUIREMENTS.

F. Coordinate location of equipment and conduit with other trades to minimize interference.

1.9 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.

1.10 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 NEC, 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.

1.11 SUBMITTALS

A. Submit to EOR in accordance with Section 013300, 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 per spec section 013300.
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.

1.12 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.

1.13 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.

1.14 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.

1.15 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

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. 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. Seal around cables penetrating fire-rated elements according to Section 078413 “Penetration Firestopping.”

G. Identify and color-code conductors and cables according to Section 260500 “Common Work Results for Electrical."

H. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

I. 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

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. 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. Product Data: Provide data for grounding electrodes and connections.

B. Test Reports: Indicate all resistance to ground and resistance of each electrode.

C. 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. Use only copper conductors for both insulated and bare grounding conductors in direct contact with earth, concrete, masonry, crushed stone and similar materials.

B. In raceways, use insulated equipment grounding conductors.

C. Exothermic-Welded Connections: Use for connections to structural steel and for underground connections.

D. 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.

E. 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.

F. 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.

G. 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.

H. 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.

I. 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.

J. 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.

K. 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

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract apply to this Section.

1.2 SUMMARY

A. Section Includes:
1. Steel slotted support systems.
2. Aluminum slotted support systems.
3. Nonmetallic slotted support systems.
4. Conduit and cable support devices.
5. Support for conductors in vertical conduit.
6. Structural steel for fabricated supports and restraints.
7. Mounting, anchoring, and attachment components, including powder-actuated fasteners, mechanical expansion anchors, concrete inserts, clamps, through bolts, toggle bolts, and hanger rods.
8. Fabricated metal equipment support assemblies.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.
1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:
a. Slotted support systems, hardware, and accessories.
b. Clamps.
c. Hangers.
d. Sockets.
e. Eye nuts.
f. Fasteners.
g. Anchors.
h. Saddles.
i. Brackets.
2. Include rated capacities and furnished specialties and accessories.

B. Shop Drawings: For fabrication and installation details for electrical hangers and support systems.
1. Hangers. Include product data for components.
2. Slotted support systems.
3. Equipment supports.
4. Vibration Isolation Base Details: Detail fabrication including anchorages and attachments to structure and to supported equipment. Include adjustable motor bases, rails, and frames for equipment mounting.

C. Delegated-Design Submittal: For hangers and supports for electrical systems.
1. Include design calculations and details of hangers.
2. Include design calculations for seismic restraints.

1.4 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Reflected ceiling plan(s) 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. Suspended ceiling components.
   2. Ductwork, piping, fittings, and supports.
   3. Structural members to which hangers and supports will be attached.
   4. Size and location of initial access modules for acoustical tile.
   5. Items penetrating finished ceiling, including the following:
      a. Luminaires.
      b. Air outlets and inlets.
      c. Speakers.
      d. Sprinklers.
      e. Access panels.
      f. Projectors.

B. Seismic Qualification Data: Certificates, for hangers and supports for electrical equipment and systems, 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. 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.

C. Welding certificates.

1.5 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M.

B. Welding Qualifications: Qualify procedures and personnel according to the following:
   1. AWS D1.1/D1.1M.
   2. AWS D1.2/D1.2M.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design hanger and support system.

B. Seismic Performance: Hangers and supports shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
   1. The term "withstand" means "the supported equipment and systems will remain in place without separation of any parts when subjected to the seismic forces specified and the supported equipment and systems will be fully operational after the seismic event."
   2. Component Importance Factor: 1.5 or 1.0.

C. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
   1. Flame Rating: Class 1.

2. Self-extinguishing according to ASTM D 635.

2.2 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

A. Steel Slotted Support Systems: Preformed steel channels and angles with minimum 13/32-inch-diameter holes at a maximum of 8 inches o.c. in at least one surface.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
a. Allied Tube & Conduit; a part of Atkore International.
b. B-line, an Eaton business.
c. ERICO International Corporation.
d. Flex-Strut Inc.
e. GS Metals Corp.
f. G-Strut.
g. Haydon Corporation.
h. Metal Ties Innovation.
i. Thomas & Betts Corporation; A Member of the ABB Group.
j. Unistrut; Part of Atkore International.
k. Wesanco, Inc.
2. Standard: Comply with MFMA-4 factory-fabricated components for field assembly.
3. Material for Channel, Fittings, and Accessories: Galvanized steel.
1. Channel Width: Selected for applicable load criteria 1-5/8 inches, 1-1/4 inches, 13/16 inches.
2. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
3. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.
4. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
5. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Aluminum Slotted Support Systems: Extruded-aluminum channels and angles with minimum 13/32-inch-diameter holes at a maximum of 8 inches o.c. in at least one surface.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
a. Cooper Industries, Inc.
b. Flex-Strut Inc.
c. Haydon Corporation.
d. MKT Metal Manufacturing.
e. Thomas & Betts Corporation; A Member of the ABB Group.
f. Unistrut; Part of Atkore International.
2. Standard: Comply with MFMA-4 factory-fabricated components for field assembly.
3. Channel Material: 6063-T5 aluminum alloy.
4. Fittings and Accessories Material: 5052-H32 aluminum alloy.
5. Channel Width: Selected for applicable load criteria 1-5/8 inches, 1-1/4 inches, 13/16 inches.
6. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.
7. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
8. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Nonmetallic Slotted Support Systems: Structural-grade, factory-formed, glass-fiber-resin channels and angles with minimum 13/32-inch-diameter holes at a maximum of 8 inches o.c., in at least one surface.
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
      a. Allied Tube & Conduit; a part of Atkore International.
      b. B-line, an Eaton business.
      c. Fabco Plastics Wholesale Limited.
      d. G-Strut.
      e. Haydon Corporation.
      f. Seasafe, Inc.; AMICO, a Gibraltar Industries Company.
   2. Standard: Comply with MFMA-4 factory-fabricated components for field assembly.
   3. Channel Width: Selected for applicable load criteria 1-5/8 inches, 1-1/4 inches or 13/16 inches.
   4. Fittings and Accessories: Products provided by channel and angle manufacturer and designed for use with those items.
   5. Fitting and Accessory Materials: Same as those for channels and angles, except metal items may be stainless steel.
   6. Rated Strength: Selected to suit applicable load criteria.
   7. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

D. Conduit and Cable Support Devices: Steel and malleable-iron hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.

E. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for nonarmored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be made of malleable iron.

F. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M steel plates, shapes, and bars; black and galvanized.

G. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
   1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
      a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
         1) Hilti, Inc.
         2) ITW Ramset/Red Head; Illinois Tool Works, Inc.
         3) MKT Fastening, LLC.
         4) Simpson Strong-Tie Co., Inc.
   2. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel, for use in hardened portland cement concrete, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
      a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
         1) B-line, an Eaton business.
         2) Empire Tool and Manufacturing Co., Inc.
         3) Hilti, Inc.

4) ITW Ramset/Red Head; Illinois Tool Works, Inc.
5) MKT Fastening, LLC.

3. Concrete Inserts: Steel or malleable-iron, slotted support system units are similar to MSS Type 18 units and comply with MFMA-4 or MSS SP-58.
4. Clamps for Attachment to Steel Structural Elements: MSS SP-58 units are suitable for attached structural element.
5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
6. Toggle Bolts: All Stainless - steel springhead type.
7. Hanger Rods: Threaded steel.

2.3 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

A. Description: Welded or bolted structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.

B. Materials: Comply with requirements in Section 055000 "Metal Fabrications" for steel shapes and plates.

PART 3 - EXECUTION

3.1 APPLICATION

A. Comply with the following standards for application and installation requirements of hangers and supports, except where requirements on Drawings or in this Section are stricter:
1. NECA 1.
2. NECA 101
3. NECA 102.
4. NECA 105.
5. NECA 111.

B. Comply with requirements in Section 078413 "Penetration Firestopping" for firestopping materials and installation for penetrations through fire-rated walls, ceilings, and assemblies.

C. Comply with requirements for raceways and boxes specified in Section 260533 "Raceways and Boxes for Electrical Systems."

D. Maximum Support Spacing and Minimum Hanger Rod Size for Raceways: Space supports for EMT, IMC, and RMC as required by scheduled in NECA 1, where its Table 1 lists maximum spacings that are less than those stated in NFPA 70. Minimum rod size shall be 1/4 inch in diameter.

E. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted or other support system, sized so capacity can be increased by at least **25** percent in future without exceeding specified design load limits.
1. Secure raceways and cables to these supports with two-bolt conduit clamps or single-bolt conduit clamps

F. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch and smaller raceways serving branch circuits and communication systems above suspended ceilings, and for fastening raceways to trapeze supports.

3.2 SUPPORT INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this article.

B. Raceway Support Methods: In addition to methods described in NECA 1, EMT, IMC and RMC may be supported by openings through structure members, according to NFPA 70.

C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.

D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
   1. To Wood: Fasten with lag screws or through bolts.
   2. To New Concrete: Bolt to concrete inserts.
   3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
   4. To Existing Concrete: Expansion anchor fasteners.
   5. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches thick.
   6. To Steel: Welded threaded studs complying with AWS D1.1/D1.1M, with lock washers and nuts, Beam clamps (MSS SP-58, Type 19, 21, 23, 25, or 27), complying with MSS SP-69.
   7. To Light Steel: Sheet metal screws.
   8. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate by means that comply with seismic-restraint strength and anchorage requirements.

E. Drill holes for expansion anchors in concrete at locations and to depths that avoid the need for reinforcing bars.

3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

A. Comply with installation requirements in Section 055000 "Metal Fabrications" for site-fabricated metal supports.

B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.

C. Field Welding: Comply with AWS D1.1/D1.1M.

3.4 CONCRETE BASES

A. Construct concrete bases of dimensions indicated, but not less than 4 inches larger in both directions than supported unit, and so anchors will be a minimum of 10 bolt diameters from edge of the base.

B. Use 3000-psi, 28-day compressive-strength concrete. Concrete materials, reinforcement, and placement requirements are specified in Section 033000 "Cast-in-Place Concrete."

C. Anchor equipment to concrete base as follows:
   1. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
   2. Install anchor bolts to elevations required for proper attachment to supported equipment.
   3. Install anchor bolts according to anchor-bolt manufacturer's written instructions.

3.5 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 minimum dry film thickness of 2.0 mils.

B. Touchup: Comply with requirements in Section 099113 "Exterior Painting"/Section 099123 "Interior Painting" and Section 099600 "High-Performance Coatings" for cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal.

C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.

1.2 SUBMITTALS

A. 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.
   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

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract apply to this Section.

1.2 SUMMARY

A. Section Includes:
1. Straight-blade convenience, hospital-grade, isolated-ground, and tamper-resistant receptacles.
2. USB charger devices.
3. GFCI receptacles.
4. Twist-locking receptacles.
5. Pendant cord-connector devices.
6. Cord and plug sets.
7. Toggle switches.
8. Decorator-style convenience.
9. Wall switch sensor light switches with ultrasonic sensors.
10. Digital timer light switches.
11. Wall-box dimmers.
12. Wall plates.
13. Floor service outlets.
14. Poke-through assemblies.
15. Prefabricated multioutlet assemblies.
16. Service poles.

1.3 DEFINITIONS

A. Abbreviations of Manufacturers' Names:
1. Cooper: Cooper Wiring Devices; Division of Cooper Industries, Inc.
2. Hubbell: Hubbell Incorporated: Wiring Devices-Kellems.
3. Leviton: Leviton Mfg. Company, Inc.
4. Pass & Seymour: Pass& Seymour/Legrand.

B. BAS: Building automation system.

C. EMI: Electromagnetic interference.

D. GFCI: Ground-fault circuit interrupter.

E. Pigtail: Short lead used to connect a device to a branch-circuit conductor.

F. RFI: Radio-frequency interference.

G. SPD: Surge protective device.

H. UTP: Unshielded twisted pair.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: List of legends and description of materials and process used for pre-marking wall plates.

C. Samples: One for each type of device and wall plate specified, in each color specified.

1.5 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For wiring devices to include in all manufacturers' packing-label warnings and instruction manuals that include labeling conditions.

PART 2 - PRODUCTS

2.1 GENERAL WIRING-DEVICE REQUIREMENTS

A. Wiring Devices, Components, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with NFPA 70.

C. Devices that are manufactured for use with modular plug-in connectors may be substituted under the following conditions:
1. Connectors shall comply with UL 2459 and shall be made with stranding building wire.
2. Devices shall comply with the requirements in this Section.

D. Devices for Owner-Furnished Equipment:
1. Receptacles: Match plug configurations.
2. Cord and Plug Sets: Match equipment requirements.

E. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.

2.2 STRAIGHT-BLADE RECEPTACLES

A. Duplex Convenience Receptacles: 125 V, 20 A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, and FS W-C-596.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
2. Eaton (Arrow Hart).
a. Hubbell Incorporated; Wiring Device-Kellems.
b. Leviton Manufacturing Co., Inc.
c. Pass & Seymour/Legrand (Pass & Seymour).

B. Hospital-Grade, Duplex Convenience Receptacles: 125 V, 20 A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498 Supplement sd, and FS W-C-596.
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
      a. Eaton (Arrow Hart).
      b. Hubbell Incorporated; Wiring Device-Kellems.
      c. Leviton Manufacturing Co., Inc.
      d. Pass & Seymour/Legrand (Pass & Seymour).
   2. Description: Single-piece, rivet-less, nickel-plated, all-brass grounding system. Nickel-plated, brass mounting strap.

C. Isolated-Ground, Duplex Convenience Receptacles: 125 V, 20 A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, and FS W-C-596.
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
      a. Eaton (Arrow Hart).
      b. Hubbell Incorporated; Wiring Device-Kellems.
      c. Leviton Manufacturing Co., Inc.
      d. Pass & Seymour/Legrand (Pass & Seymour).
   2. Description: Straight blade; equipment grounding contacts shall be connected only to the green grounding screw terminal of the device and with inherent electrical isolation from mounting strap. Isolation shall be integral to receptacle construction and not dependent on removable parts.

D. Tamper-Resistant Convenience Receptacles: 125 V, 20 A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, and FS W-C-596.
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
      a. Eaton (Arrow Hart).
      b. Hubbell Incorporated; Wiring Device-Kellems.
      c. Leviton Manufacturing Co., Inc.
      d. Pass & Seymour/Legrand (Pass & Seymour).
   2. Description: Labeled and complying with NFPA 70, "Health Care Facilities" Article, "Pediatric Locations" Section.

2.3 USB CHARGER DEVICES

A. Tamper-Resistant, USB Charger Receptacles: 12 V dc, 2.0 A, USB Type A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, UL 1310, and FS W-C-596.
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
      a. Eaton (Arrow Hart).
      b. Hubbell Incorporated; Wiring Device-Kellems.
      c. Leviton Manufacturing Co., Inc.
      d. Pass & Seymour/Legrand (Pass & Seymour).
   2. Description: Single-piece, rivet-less, nickel-plated, all-brass grounding system. Nickel-plated, brass mounting strap.
   3. USB Receptacles: Type A.
   4. Line Voltage Receptacles: two pole, three wire, and self-grounding.

B. Hospital-Grade, USB Charger Receptacles: 12 V dc, 2.0 A, USB Type A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498 Supplement sd, UL 1310, and FS W-C-596.
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
      a. Eaton (Arrow Hart).
      b. Hubbell Incorporated; Wiring Device-Kellems.
      c. Leviton Manufacturing Co., Inc.
      d. Pass & Seymour/Legrand (Pass & Seymour).
   2. Description: Labeled and complying with NFPA 70, "Health Care Facilities" Article, "Pediatric Locations" Section.
   3. USB Receptacles: Type A.
   4. Line Voltage Receptacles: two-pole, three wire, and self-grounding.

2.4 GFCI RECEPTACLES

A. General Description:
   1. 125 V, 20 A, straight blade, non-feed-through type.
   2. Comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, UL 943 Class A, and FS W-C-596.
   3. Include indicator light that shows when the GFCI has malfunctioned and no longer provides proper GFCI protection.

B. Duplex GFCI Convenience Receptacles:
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
      a. Eaton (Arrow Hart).
      b. Hubbell Incorporated; Wiring Device-Kellems.
      c. Leviton Manufacturing Co., Inc.
      d. Pass & Seymour/Legrand (Pass & Seymour).

C. Tamper-Resistant, Duplex GFCI Convenience Receptacles:
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
      a. Hubbell Incorporated; Wiring Device-Kellems.
      b. Pass & Seymour/Legrand (Pass & Seymour).

D. Hospital-Grade, Duplex GFCI Convenience Receptacles: Comply with UL 498 Supplement sd.
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
      a. Eaton (Arrow Hart).
      b. Hubbell Incorporated; Wiring Device-Kellems.
      c. Leviton Manufacturing Co., Inc.
      d. Pass & Seymour/Legrand (Pass & Seymour).

2.5 SPD RECEPTACLES

A. General Description: Comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, UL 1449, and FS W-C-596, with integral SPD in line to ground, line to neutral, and neutral to ground.
   1. 125 V, 20 A, straight-blade type.

2. SPD Components: Multiple metal-oxide varistors; with a nominal clamp-level rating of 400 V and minimum single transient pulse energy dissipation of 240 J, according to IEEE C62.41.2 and IEEE C62.45.
3. Active SPD Indication: Visual and audible, with light visible in face of device to indicate device is "active" or "no longer in service."

2.6 TWIST-LOCKING RECEPTACLES

A. Twist-Lock, Single Convenience Receptacles: 125 V, 20 A; comply with NEMA WD 1, NEMA WD 6 Configuration L5-20R, and UL 498.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
a. Eaton (Arrow Hart).
b. Hubbell Incorporated; Wiring Device-Kellems.
c. Leviton Manufacturing Co., Inc.
d. Pass & Seymour/Legrand (Pass & Seymour).

B. Twist-Lock, Isolated-Ground, Single Convenience Receptacles: 125 V, 20 A; comply with NEMA WD 1, NEMA WD 6 Configuration L5-20R, and UL 498.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
a. Eaton (Arrow Hart).
b. Hubbell Incorporated; Wiring Device-Kellems.
c. Leviton Manufacturing Co., Inc.
d. Pass & Seymour/Legrand (Pass & Seymour).
2. Grounding: Equipment grounding contacts shall be connected only to the green grounding screw terminal of the device and with inherent electrical isolation from mounting strap. Isolation shall be integral to receptacle construction and not dependent on removable parts.

2.7 PENDANT CORD-CONNECTOR DEVICES

A. Description:
1. Matching, locking-type plug and receptacle body connector.
2. NEMA WD 6 Configurations L5-20P and L5-20R, heavy-duty grade, and FS W-C-596.
3. Body: Nylon, with screw-open, cable-gripping jaws and provision for attaching external cable grip.
4. External Cable Grip: Woven wire-mesh type made of high-strength, galvanized-steel wire strand, matched to cable diameter, and with attachment provision designed for corresponding connector.

2.8 CORD AND PLUG SETS

A. Description:
1. Match voltage and current ratings and number of conductors to requirements of equipment being connected.
2. Cord: Rubber-insulated, stranded-copper conductors, with Type SOW-A jacket; with green-insulated grounding conductor and ampacity of at least 130 percent of the equipment rating.
3. Plug: Nylon body and integral cable-clamping jaws. Match cord and receptacle type for connection.

2.9 TOGGLE SWITCHES

A. Comply with NEMA WD 1, UL 20, and FS W-S-896.

B. Switches, 120/277 V, 20 A:
1. Single Pole:
a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
1) Eaton (Arrow Hart).
2) Hubbell Incorporated; Wiring Device-Kellems.
3) Leviton Manufacturing Co., Inc.
4) Pass & Seymour/Legrand (Pass & Seymour).
2. Two Pole:
a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
1) Eaton (Arrow Hart).
2) Hubbell Incorporated; Wiring Device-Kellems.
3) Leviton Manufacturing Co., Inc.
4) Pass & Seymour/Legrand (Pass & Seymour).
3. Three Way:
a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
1) Eaton (Arrow Hart).
2) Hubbell Incorporated; Wiring Device-Kellems.
3) Leviton Manufacturing Co., Inc.
4) Pass & Seymour/Legrand (Pass & Seymour).
4. Four Way:
a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
1) Eaton (Arrow Hart).
2) Hubbell Incorporated; Wiring Device-Kellems.
3) Leviton Manufacturing Co., Inc.
4) Pass & Seymour/Legrand (Pass & Seymour).

C. Single-Pole, Double-Throw, Momentary-Contact, Center-off Switches: 120/277 V, 20 A; for use with mechanically held lighting contactors.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
a. Eaton (Arrow Hart).
b. Hubbell Incorporated; Wiring Device-Kellems.
c. Leviton Manufacturing Co., Inc.
d. Pass & Seymour/Legrand (Pass & Seymour).

D. Convenience Receptacles: Square face, 125 V, 15 A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-15R, and UL 498.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
a. Eaton (Arrow Hart).
b. Hubbell Incorporated; Wiring Device-Kellems.
c. Leviton Manufacturing Co., Inc.

d. Pass & Seymour/Legrand (Pass & Seymour).

E. Tamper-Resistant Convenience Receptacles: Square face, 125 V, 15 A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-15R, and UL 498.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
a. Eaton (Arrow Hart).
b. Hubbell Incorporated; Wiring Device-Kellems.
c. Leviton Manufacturing Co., Inc.
d. Pass & Seymour/Legrand (Pass & Seymour).
2. Description: Labeled to comply with NFPA 70, "Receptacles, Cord Connectors, and Attachment Plugs (Caps)" Article, "Tamper-Resistant Receptacles in Dwelling Units" Section.

F. Tamper-Resistant and Weather-Resistant Convenience Receptacles: Square face, 125 V, 15 A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-15R, and UL 498.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
a. Eaton (Arrow Hart).
b. Hubbell Incorporated; Wiring Device-Kellems.
c. Leviton Manufacturing Co., Inc.
d. Pass & Seymour/Legrand (Pass & Seymour).
2. Description: Labeled to comply with NFPA 70, "Receptacles, Cord Connectors, and Attachment Plugs (Caps)" Article, "Tamper-Resistant Receptacles in Dwelling Units" Section, when installed in wet and damp locations.

G. GFCI, Non-Feed-Through Type, Convenience Receptacles: Square face, 125 V, 15 A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-15R, UL 498, and UL 943 Class A.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
a. Eaton (Arrow Hart).
b. Hubbell Incorporated; Wiring Device-Kellems.
c. Leviton Manufacturing Co., Inc.
d. Pass & Seymour/Legrand (Pass & Seymour).

H. GFCI, Tamper-Resistant and Weather-Resistant Convenience Receptacles: Square face, 125 V, 15 A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-15R, UL 498, and UL 943 Class A.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
a. Eaton (Arrow Hart).
b. Hubbell Incorporated; Wiring Device-Kellems.
c. Pass & Seymour/Legrand (Pass & Seymour).
2. Description: Labeled to comply with NFPA 70, "Receptacles, Cord Connectors, and Attachment Plugs (Caps)" Article, "Tamper-Resistant Receptacles in Dwelling Units" Section.

I. Toggle Switches: Square Face, 120/277 V, 15 A; comply with NEMA WD 1, UL 20, and FS W-S-896.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Eaton (Arrow Hart).
b. Hubbell Incorporated; Wiring Device-Kellems.
c. Leviton Manufacturing Co., Inc.
d. Pass & Seymour/Legrand (Pass & Seymour).

J. Lighted Toggle Switches: Square Face, 120 V, 15 A; comply with NEMA WD 1 and UL 20.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
a. Eaton (Arrow Hart).
b. Hubbell Incorporated; Wiring Device-Kellems.
c. Leviton Manufacturing Co., Inc.
d. Pass & Seymour/Legrand (Pass & Seymour).
2. Description: With LED-lighted handle, illuminated when switch is off.

2.10 WALL SWITCH SENSOR LIGHT SWITCH, ULTRASONIC

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
1. Eaton (Arrow Hart).
2. Hubbell Incorporated; Wiring Device-Kellems.
3. Leviton Manufacturing Co., Inc.

B. Description: Switchbox-mounted, combination, lighting-control sensor and conventional switch lighting-control unit using ultrasonic technology.
1. Connections: Provisions for connection to BAS.
2. Connections: Hard wired.
3. Connections: Wireless.
4. Rated 960 W at 120-V ac for tungsten lighting, 10 A at 120-V ac or 10 A at 277-V ac for fluorescent or LED lighting, and 1/4 hp at 120-V ac.
5. Integral relay for connection to BAS.
6. Adjustable time delay of 20 minutes.
7. Able to be locked to Manual-On mode.
8. Automatic Light-Level Sensor: Adjustable from 2 to 200 fc.
9. Comply with NEMA WD 1, UL 20, and FS W-S-896.

2.11 DIGITAL TIMER LIGHT SWITCH

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
1. Eaton (Arrow Hart).
2. Hubbell Incorporated; Wiring Device-Kellems.
3. Leviton Manufacturing Co., Inc.

B. Description: Switchbox-mounted, combination digital timer and conventional switch lighting-control unit, with backlit digital display, with selectable time interval in 10-minute increments.
1. Rated 960 W at 120-V ac for tungsten lighting, 10 A at 120-V ac or 10 A at 277-V ac for fluorescent or LED lighting, and 1/4 hp at 120-V ac.
2. Integral relay for connection to BAS.

2.12 WALL-BOX DIMMERS

A. Dimmer Switches: Modular, full-wave, solid-state units with integral, quiet on-off switches, with audible frequency and EMI/RFI suppression filters.

B. Control: Continuously adjustable slider; with single-pole or three-way switching. Comply with UL 1472.

C. Incandescent Lamp Dimmers: 120 V; control shall follow square-law dimming curve. On-off switch positions shall bypass dimmer module.
1. 600 W; dimmers shall require no derating when ganged with other devices.

D. Fluorescent Lamp Dimmer Switches: Modular; compatible with dimmer ballasts; trim potentiometer to adjust low-end dimming; dimmer-ballast combination capable of consistent dimming with low end not greater than 20 percent of full brightness.

E. LED Lamp Dimmer Switches: Modular; compatible with LED lamps; trim potentiometer to adjust low-end dimming; capable of consistent dimming with low end not greater than 20 percent of full brightness.

2.13 WALL PLATES

A. Single and combination types shall match corresponding wiring devices.
1. Plate-Securing Screws: Metal with head color to match plate finish.
2. Material for Finished Spaces: Smooth, high-impact thermoplastic.
3. Material for Unfinished Spaces: Smooth, high-impact thermoplastic.
4. Material for Damp Locations: Thermoplastic with spring-loaded lift cover and listed and labeled for use in wet and damp locations.

B. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with Type 3R, weather-resistant thermoplastic with lockable cover.

2.14 POKE-THROUGH ASSEMBLIES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
1. Hubbell Incorporated; Wiring Device-Kellems.
2. Pass & Seymour/Legrand (Pass & Seymour).
3. Square D; by Schneider Electric.
4. Wiremold / Legrand.

B. Description:
1. Factory-fabricated and -wired assembly of below-floor junction box with multi-channeled, through-floor raceway/firestop unit and detachable matching floor service-outlet assembly.
2. Comply with UL 514 scrub water exclusion requirements.
3. Service-Outlet Assembly: Pedestal type with services indicated complying with requirements in Section 271513 "Communications Copper Horizontal Cabling."
4. Size: Selected to fit nominal cored holes in floor and matched to floor thickness.
5. Fire Rating: Unit is listed and labeled for fire rating of floor-ceiling assembly.
6. Closure Plug: Arranged to close unused cored openings and reestablish fire rating of floor.
7. Wiring Raceways and Compartments: For a minimum of four No. 12 AWG conductors and a minimum of four, four-pair cables that comply with requirements in Section 271513 "Communications Copper Horizontal Cabling."

2.15 PREFABRICATED MULTIOUTLET ASSEMBLIES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   1. Hubbell Incorporated; Wiring Device-Kellems.
   2. Wiremold / Legrand.

B. Description:
   1. Two-piece surface metal raceway, with factory-wired multioutlet harness.
   2. Components shall be products from single manufacturer designed for use as a complete, matching assembly of raceways and receptacles.

C. Raceway Material: Metal, with manufacturer's standard finish.

2.16 FINISHES

A. Device Color:
   1. Wiring Devices Connected to Normal Power System: As selected by Architect unless otherwise indicated or required by NFPA 70 or device listing.
   2. Wiring Devices Connected to Emergency Power System: Red.
   3. SPD Devices: Blue.
   4. Isolated-Ground Receptacles: Orange.

B. Wall Plate Color: For plastic covers, match device color.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.

B. Coordination with Other Trades:
   1. Protect installed devices and their boxes. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of boxes.
   2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
   3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
   4. Install wiring devices after all wall preparation, including painting, is complete.

C. Conductors:
   1. Do not strip insulation from conductors until right before they are spliced or terminated on devices.
   2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
   3. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.
   4. Existing Conductors:
      a. Cut back and pigtail or replace all damaged conductors.
      b. Straighten conductors that remain and remove corrosion and foreign matter.

c. Pig-tailing existing conductors is permitted, provided the outlet box is large enough.

D. Device Installation:
1. Replace devices that have been in temporary use during construction and that were installed before building finishing operations were complete.
2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
4. Connect devices to branch circuits using pigtails that are not less than 6 inches in length.
5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, two-thirds to three-fourths of the way around terminal screw.
6. Use a torque screwdriver when a torque is recommended or required by manufacturer.
7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.
8. Tighten unused terminal screws on the device.
9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.

E. Receptacle Orientation:
1. Install ground pin of vertically mounted receptacles down, and on horizontally mounted receptacles to the right.
2. Install hospital-grade receptacles in patient-care areas with the ground pin or neutral blade at the top.

F. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.

G. Dimmers:
1. Install dimmers within terms of their listing.
2. Verify that dimmers used for fan-speed control are listed for that application.
3. Install unshared neutral conductors online and load side of dimmers according to manufacturers' device listing conditions in the written instructions.

H. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.

I. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.

3.2 GFCI RECEPTACLES

A. Install non-feed-through-type GFCI receptacles where protection of downstream receptacles is not required.

3.3 IDENTIFICATION

A. Comply with Section 260553 "Identification for Electrical Systems."

B. Identify each receptacle with panelboard identification and circuit number. Use hot, stamped, or engraved machine printing with black-filled lettering on face of plate, and durable wire markers or tags inside outlet boxes.

3.4 FIELD QUALITY CONTROL

A. Test Instruments: Use instruments that comply with UL 1436.

B. Test Instrument for Convenience Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.

C. Perform the following tests and inspections:
1. In healthcare facilities, prepare reports that comply with recommendations in NFPA 99.
2. Test Instruments: Use instruments that comply with UL 1436.
3. Test Instrument for Convenience Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.

D. Tests for Convenience Receptacles:
1. Line Voltage: Acceptable range is 105 to 132 V.
2. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
3. Using the test plug, verify that the device and its outlet box are securely mounted.

E. Wiring device will be considered defective if it does not pass tests and inspections.

F. Prepare test and inspection reports.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract to this Section.

1.2 SUMMARY

A. Section Includes:
1. Fusible switches.
2. Nonfusible switches.
3. Receptacle switches.
4. Shunt trip switches.
5. Molded-case circuit breakers (MCCBs).
6. Molded-case switches.
7. Enclosures.

1.3 DEFINITIONS

A. NC: Normally closed.

B. NO: Normally open.

C. SPDT: Single pole, double throw.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated. Include nameplate ratings, dimensioned elevations, sections, weights, and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.
1. Enclosure types and details for types other than NEMA 250, Type 1.
2. Current and voltage ratings.
3. Short-circuit current ratings (interrupting and withstand, as appropriate).
4. Include evidence of a nationally recognized testing laboratory (NRTL) listing for series rating of installed devices.
5. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices, accessories, and auxiliary components.
6. Include time-current coordination curves (average melt) for each type and rating of overcurrent protective device; include selectable ranges for each type of overcurrent protective device. Provide in PDF and electronic format.

B. Shop Drawings: For enclosed switches and circuit breakers.
1. Include plans, elevations, sections, details, and attachments to other work.
2. Include wiring diagrams for power, signal, and control wiring.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified testing agency.

B. Seismic Qualification Data: Certificates, for enclosed switches and circuit breakers, 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. 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.

C. Field quality-control reports.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For enclosed switches and circuit breakers to include in emergency, operation, and maintenance manuals.
   a. Manufacturer's written instructions for testing and adjusting enclosed switches and circuit breakers.
   2. Time-current coordination curves (average melt) for each type and rating of overcurrent protective device; include selectable ranges for each type of overcurrent protective device. Provide in PDF and electronic format.

1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Fuses: Equal to 10 percent of quantity installed for each size and type, but no fewer than three of each size and type.
   2. Fuse Pullers: Two for each size and type.

1.8 QUALITY ASSURANCE

A. Testing Agency Qualifications: Accredited by NETA.
   1. Testing Agency's Field Supervisor: Currently certified by NETA to supervise on-site testing.

1.9 FIELD CONDITIONS

A. Environmental Limitations: Rate equipment for continuous operation under the following conditions unless otherwise indicated:
   1. Ambient Temperature: Not less than minus 22 deg F and not exceeding 104 deg F.
   2. Altitude: Not exceeding 6600 feet.

1.10 WARRANTY

A. Manufacturer's Warranty: Manufacturer and Installer agree to repair or replace components that fail in materials or workmanship within specified warranty period.
   1. Warranty Period: three year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Enclosed switches and circuit breakers 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 and the unit will be fully operational after the seismic event."

2.2 GENERAL REQUIREMENTS

A. Source Limitations: Obtain enclosed switches and circuit breakers, overcurrent protective devices, components, and accessories, within same product category, from single manufacturer.

B. Product Selection for Restricted Space: Drawings indicate maximum dimensions for enclosed switches and circuit breakers, including clearances between enclosures, and adjacent surfaces and other items. Comply with indicated maximum dimensions.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by an NRTL, and marked for intended location and application.

D. Comply with NFPA 70.

2.3 FUSIBLE SWITCHES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   1. ABB Inc.
   2. Eaton.
   3. General Electric Company.
   4. SIEMENS Industry, Inc.; Energy Management Division.
   5. Square D; by Schneider Electric.

B. Type HD, Heavy Duty:
   1. Single throw.
   2. Three pole.
   3. 600-V ac.
   4. 200 A and smaller.
   5. UL 98 and NEMA KS 1, horsepower rated, with clips or bolt pads to accommodate specified fuses.
   6. Lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

C. Accessories:
   1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
   2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
   3. Isolated Ground Kit: Internally mounted; insulated, labeled for copper and aluminum neutral conductors.
   4. Class R Fuse Kit: Provides rejection of other fuse types when Class R fuses are specified.

5. Auxiliary Contact Kit: Two NO/NC (Form "C") auxiliary contact(s), arranged to activate before switch blades open. Contact rating - 24-V ac
6. Hookstick Handle: Allows use of a hookstick to operate the handle.
7. Lugs: Mechanical/Compression type, suitable for number, size, and conductor material.
8. Service-Rated Switches: Labeled for use as service equipment.

2.4 NONFUSIBLE SWITCHES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
1. Eaton.
2. General Electric Company.
3. SIEMENS Industry, Inc.; Energy Management Division.
4. Square D; by Schneider Electric.

B. Type GD, General Duty, Three Pole, Single Throw, 240-V ac, 600 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept two padlocks, and interlocked with cover in closed position.

C. Type HD, Heavy Duty, Three Pole, Single Throw, 600-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

D. Type HD, Heavy Duty, Six Pole, Single Throw, 600-V ac, 200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

E. Type HD, Heavy Duty, Three Pole, Double Throw, 600-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

F. Accessories:
1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
3. Isolated Ground Kit: Internally mounted; insulated, labeled for copper and aluminum neutral conductors.
4. Class R Fuse Kit: Provides rejection of other fuse types when Class R fuses are specified.
5. Auxiliary Contact Kit: Two NO/NC (Form "C") auxiliary contact(s), arranged to activate before switch blades open. Contact rating - 24-V ac
6. Hookstick Handle: Allows use of a hookstick to operate the handle.
7. Lugs: Mechanical/Compression type, suitable for number, size, and conductor material.
8. Service-Rated Switches: Labeled for use as service equipment.

2.5 RECEPTACLE SWITCHES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
1. Eaton.
2. General Electric Company.
3. SIEMENS Industry, Inc.; Energy Management Division.
4. Square D; by Schneider Electric.

B. Type HD, Heavy-Duty, Three Pole, Single-Throw Fusible Switch: 600-V ac, 30, 60, 100 A; UL 98 and NEMA KS 1; horsepower rated, with clips or bolt pads to accommodate specified fuses; lockable handle with capability to accept three padlocks; interlocked with cover in closed position.

C. Type HD, Heavy-Duty, Three Pole, Single-Throw Nonfusible Switch: 600-V ac, 30, 60, 100 A; UL 98 and NEMA KS 1; horsepower rated, lockable handle with capability to accept three padlocks; interlocked with cover in closed position.

D. Interlocking Linkage: Provided between the receptacle and switch mechanism to prevent inserting or removing plug while switch is in the on position, inserting any plug other than specified, and turning switch on if an incorrect plug is inserted or correct plug has not been fully inserted into the receptacle.

E. Receptacle: Polarized, three-phase, four-wire receptacle (fourth wire connected to enclosure ground lug).

F. Accessories:
1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
3. Isolated Ground Kit: Internally mounted; insulated, labeled for copper and aluminum neutral conductors.
4. Class R Fuse Kit: Provides rejection of other fuse types when Class R fuses are specified.
5. Auxiliary Contact Kit: Two NO/NC (Form "C") auxiliary contact(s), arranged to activate before switch blades open. Contact rating - 24-V ac.
6. Hookstick Handle: Allows use of a hookstick to operate the handle.
7. Lugs: Mechanical/Compression type, suitable for number, size, and conductor material.
8. Service-Rated Switches: Labeled for use as service equipment.

2.6 SHUNT TRIP SWITCHES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
1. Bussmann, an Eaton business.
2. Littelfuse, Inc.
3. Mersen USA.

B. General Requirements: Comply with ASME A17.1, UL 50, and UL 98, with Class J fuse block and 200-kA interrupting and short-circuit current rating.

C. Type HD, Heavy-Duty, Three Pole, Single-Throw Fusible Switch: 600-V ac, 30, 60, 100 A; UL 98 and NEMA KS 1; integral shunt trip mechanism; horsepower rated, with clips or bolt pads to accommodate specified fuses; lockable handle with capability to accept three padlocks; interlocked with cover in closed position.

D. Type HD, Heavy-Duty, Three Pole, Single-Throw Nonfusible Switch: 600-V ac, 30, 60, 100 A; UL 98 and NEMA KS 1; integral shunt trip mechanism; horsepower rated, lockable handle with capability to accept three padlocks; interlocked with cover in closed position.

E. Control Circuit: 120-V ac; obtained from integral control power transformer, with primary and secondary fuses, with a control power transformer or source of enough capacity to operate shunt trip, pilot, indicating and control devices.

F. Accessories:
1. Oiltight key switch for key-to-test function.
2. Oiltight red ON pilot light.
3. Isolated neutral lug; 100 or 200 percent rating.
4. Mechanically interlocked auxiliary contacts that change state when switch is opened and closed.
5. Form C alarm contacts that change state when switch is tripped.
6. Three-pole, double-throw, fire-safety and alarm relay; 120-V ac or 24-V dc coil voltage.
7. Three-pole, double-throw, fire-alarm voltage monitoring relay complying with NFPA 72.
8. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
9. Isolated Ground Kit: Internally mounted; insulated, labeled for copper and aluminum neutral conductors.
10. Class R Fuse Kit: Provides rejection of other fuse types when Class R fuses are specified.
11. Auxiliary Contact Kit: Two NO/NC (Form "C") auxiliary contact(s), arranged to activate before switch blades open. Contact rating - 24-V ac.
12. Hookstick Handle: Allows use of a hookstick to operate the handle.
13. Lugs: Mechanical/Compression type, suitable for number, size, and conductor material.
14. Service-Rated Switches: Labeled for use as service equipment.

2.7 MOLDED-CASE CIRCUIT BREAKERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
1. Eaton.
2. General Electric Company.
3. NOARK Electric North America.
4. SIEMENS Industry, Inc.; Energy Management Division.
5. Square D; by Schneider Electric.

B. Circuit breakers shall be constructed using glass-reinforced insulating material. Current carrying components shall be completely isolated from the handle and the accessory mounting area.

C. Circuit breakers shall have a toggle operating mechanism with common tripping of all poles, which provides quick-make, quick-break contact action. The circuit-breaker handle shall be over center, be trip free, and reside in a tripped position between on and off to provide local trip indication. Circuit-breaker escutcheon shall be clearly marked on and off in addition to providing international I/O markings. Equip circuit breaker with a push-to-trip button, located on the face of the circuit breaker to mechanically operate the circuit-breaker tripping mechanism for maintenance and testing purposes.

D. The maximum ampere rating and UL, IEC, or other certification standards with applicable voltage systems and corresponding interrupting ratings shall be clearly marked on face of circuit breaker. Circuit breakers shall be 100 percent rated. Circuit breaker/circuit breaker combinations for series connected interrupting ratings shall be listed by UL as recognized component combinations. Any series rated combination used shall be marked on the end-use equipment along with the statement "Caution - Series Rated System. _____ Amps Available. Identical Replacement Component Required."

E. MCCBs shall be equipped with a device for locking in the isolated position.

F. Lugs shall be suitable for 140 deg F rated wire on 125-A circuit breakers and below, 167 deg F rated wire, 194 deg F rated wire, sized according to the 167 deg F temperature rating in NFPA 70.

G. Standard: Comply with UL 489 with interrupting capacity to comply with available fault currents.

H. Thermal-Magnetic Circuit Breakers: Inverse time-current thermal element for low-level overloads and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.

I. Adjustable, Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.

J. Electronic Trip Circuit Breakers: Field-replaceable rating plug, rms sensing, with the following field-adjustable settings:
   1. Instantaneous trip.
   2. Long- and short-time pickup levels.
   3. Long- and short-time time adjustments.
   4. Ground-fault pickup level, time delay, and I-squared t response.

K. Current-Limiting Circuit Breakers: Frame sizes 400 A and smaller, and let-through ratings less than NEMA FU 1, RK-5.

L. Integrally Fused Circuit Breakers: Thermal-magnetic trip element with integral limiter-style fuse listed for use with circuit breaker and trip activation on fuse opening or on opening of fuse compartment door.

M. Ground-Fault Circuit-Interrupter (GFCI) Circuit Breakers: Single- and two-pole configurations with Class A ground-fault protection (6-mA trip).

N. Ground-Fault Equipment-Protection (GFEP) Circuit Breakers: With Class B ground-fault protection (30-mA trip).

O. Features and Accessories:
   1. Standard frame sizes, trip ratings, and number of poles.
   2. Lugs: Mechanical/Compression type, suitable for number, size, trip ratings, and conductor material.
   3. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and high-intensity discharge lighting circuits.
   4. Ground-Fault Protection: Comply with UL 1053; integrally mounted, self-powered or remote-mounted and powered type with mechanical ground-fault indicator; relay with adjustable pickup and time-delay settings, push-to-test feature, internal memory, and shunt trip unit; and three-phase, zero-sequence current transformer/sensor.
   5. Communication Capability: Circuit-breaker-mounted, Universal-mounted or Integral communication module with functions and features compatible with power monitoring and control system, specified in Section 260913 "Electrical Power Monitoring and Control."
   6. Shunt Trip: Trip coil energized from separate circuit, with coil-clearing contact.
   7. Undervoltage Trip: Set to operate at 35 to 75 percent of rated voltage without intentional time delay.
   8. Auxiliary Contacts: One SPDT switch with "a" and "b" contacts; "a" contacts mimic circuit-breaker contacts, "b" contacts operate in reverse of circuit-breaker contacts.
   9. Alarm Switch: One NO contact that operates only when circuit breaker has tripped.
   10. Key Interlock Kit: Externally mounted to prohibit circuit-breaker operation; key shall be removable only when circuit breaker is in off position.
   11. Zone-Selective Interlocking: Integral with ground-fault trip unit; for interlocking ground-fault protection function.
   12. Electrical Operator: Provide remote control for on, off, and reset operations.
   13. Accessory Control Power Voltage: Integrally mounted, self-powered.

2.8 MOLDED-CASE SWITCHES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   1. Eaton.
   2. General Electric Company.
   3. NOARK Electric North America.
   4. SIEMENS Industry, Inc.; Energy Management Division.
   5. Square D; by Schneider Electric.

B. Description: MCCB with fixed, high-set instantaneous trip only, and short-circuit withstand rating equal to equivalent breaker frame size interrupting rating.

C. Standard: Comply with UL 489 with interrupting capacity to comply with available fault currents.

D. Features and Accessories:
   1. Standard frame sizes and number of poles.
   2. Lugs:
      a. Mechanical/Compression type, suitable for number, size, trip ratings, and conductor material.
      b. Lugs shall be suitable for 140 deg F rated wire on 125-A circuit breakers and below, 167 deg F rated wire, 194 deg F rated wire, sized according to the 167 deg F temperature rating in NFPA 70.
   3. Ground-Fault Protection: Comply with UL 1053; remote-mounted and powered type with mechanical ground-fault indicator; relay with adjustable pickup and time-delay settings, push-to-test feature, internal memory, and shunt trip unit; and three-phase, zero-sequence current transformer/sensor.
   4. Shunt Trip: Trip coil energized from separate circuit, with coil-clearing contact.
   5. Undervoltage Trip: Set to operate at 35 to 75 percent of rated voltage without intentional time delay.
   6. Auxiliary Contacts: Two SPDT switches with "a" and "b" contacts; "a" contacts mimic switch contacts, "b" contacts operate in reverse of switch contacts.
   7. Alarm Switch: One NC contact that operates only when switch has tripped.
   8. Key Interlock Kit: Externally mounted to prohibit switch operation; key shall be removable only when switch is in off position.
   9. Zone-Selective Interlocking: Integral with ground-fault shunt trip unit; for interlocking ground-fault protection function.
   10. Electrical Operator: Provide remote control for on, off, and reset operations.
   11. Accessory Control Power Voltage: Integrally mounted, self-powered.

2.9 ENCLOSURES

A. Enclosed Switches and Circuit Breakers: UL 489, NEMA KS 1, NEMA 250, and UL 50, to comply with environmental conditions at installed location.

B. Enclosure Finish: The enclosure shall be finished with gray baked enamel paint, electrodeposited on cleaned, phosphatized steel (NEMA 250 Type 1 or gray baked enamel paint, electrodeposited on cleaned, phosphatized galvannealed steel (NEMA 250 Types 3R)

C. Conduit Entry: NEMA 250 Types 4, 4X, and 12 enclosures shall contain no knockouts. NEMA 250 Types 7 and 9 enclosures shall be provided with threaded conduit openings in both endwalls.

D. Operating Mechanism: The circuit-breaker operating handle shall be externally operable with the operating mechanism being an integral part of the box, not the cover or directly operable

through the dead front trim of the enclosure (NEMA 250 Type 3R). The cover interlock mechanism shall have an externally operated override. The override shall not permanently disable the interlock mechanism, which shall return to the locked position once the override is released. The tool used to override the cover interlock mechanism shall not be required to enter the enclosure in order to override the interlock.

E. Enclosures designated as NEMA 250 Type 4, 4X stainless steel, 12, or 12K shall have a dual cover interlock mechanism to prevent unintentional opening of the enclosure cover when the circuit breaker is ON and to prevent turning the circuit breaker ON when the enclosure cover is open.

F. NEMA 250 Type 7/9 enclosures shall be furnished with a breather and drain kit to allow their use in outdoor and wet location applications.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine elements and surfaces to receive enclosed switches and circuit breakers for compliance with installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.
   1. Commencement of work shall indicate Installer's acceptance of the areas and conditions as satisfactory.

3.2 PREPARATION

A. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:
   1. Notify Architect, Construction Manager and Owner no fewer than seven days in advance of proposed interruption of electric service.
   2. Indicate method of providing temporary electric service.
   3. Do not proceed with interruption of electric service without Architect, Construction Manager and Owner written permission.
   4. Comply with NFPA 70E.

3.3 ENCLOSURE ENVIRONMENTAL RATING APPLICATIONS

A. Enclosed Switches and Circuit Breakers: Provide enclosures at installed locations with the following environmental ratings.
   1. Indoor, Dry and Clean Locations: NEMA 250, Type 1.
   2. Outdoor Locations: NEMA 250, Type 3R.
   3. Kitchen Areas: NEMA 250, Type 4X, stainless steel.
   4. Other Wet o Damp, Indoor Locations: NEMA 250, Type 4.
   5. Indoor Locations Subject to Dust, Falling Dirt, and Dripping Noncorrosive Liquids: NEMA 250, Type 12.
   6. Hazardous Areas Indicated on Drawings: NEMA 250, Type 7 with cover attached by Type 316 stainless steel bolts.

3.4 INSTALLATION

A. Coordinate layout and installation of switches, circuit breakers, and components with equipment served and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

B. Install individual wall-mounted switches and circuit breakers with tops at uniform height unless otherwise indicated.

C. Comply with mounting and anchoring requirements specified in Section 260548.16 "Seismic Controls for Electrical Systems."

D. Temporary Lifting Provisions: Remove temporary lifting of eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.

E. Install fuses in fusible devices.

F. Comply with NFPA 70 and NECA 1.

3.5 IDENTIFICATION

A. Comply with requirements in Section 260553 "Identification for Electrical Systems."
   1. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.
   2. Label each enclosure with engraved metal or laminated-plastic nameplate.

3.6 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

C. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

D. Perform tests and inspections with the assistance of a factory-authorized service representative.

E. Tests and Inspections for Switches:
   1. Visual and Mechanical Inspection:
      a. Inspect physical and mechanical condition.
      b. Inspect anchorage, alignment, grounding, and clearances.
      c. Verify that the unit is clean.
      d. Verify blade alignment, blade penetration, travel stops, and mechanical operation.
      e. Verify that fuse sizes and types match the Specifications and Drawings.
      f. Verify that each fuse has adequate mechanical support and contact integrity.
      g. Inspect bolted electrical connections for high resistance using one of the two following methods:
         1) Use a low-resistance ohmmeter.
            a) Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from those of similar bolted connections by more than 50 percent of the lowest value.
         2) Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method in accordance with manufacturer's published data or NETA ATS Table 100.12.

a) Bolt-torque levels shall be in accordance with manufacturer's published data. In the absence of manufacturer's published data, use NETA ATS Table 100.12.

h. Verify that operation and sequencing of interlocking systems is as described in the Specifications and shown on the Drawings.
i. Verify correct phase barrier installation.
j. Verify lubrication of moving current-carrying parts and moving and sliding surfaces.

2. Electrical Tests:
   a. Perform resistance measurements through bolted connections with a low-resistance ohmmeter. Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from adjacent poles or similar switches by more than 50 percent of the lowest value.
   b. Measure contact resistance across each switchblade fuseholder. Drop values shall not exceed the high level of the manufacturer's published data. If manufacturer's published data are not available, investigate values that deviate from adjacent poles or similar switches by more than 50 percent of the lowest value.
   c. Perform insulation-resistance tests for one minute on each pole, phase-to-phase and phase-to-ground with switch closed, and across each open pole. Apply voltage in accordance with manufacturer's published data. In the absence of manufacturer's published data, use Table 100.1 from the NETA ATS. Investigate values of insulation resistance less than those published in Table 100.1 or as recommended in manufacturer's published data.
   d. Measure fuse resistance. Investigate fuse-resistance values that deviate from each other by more than 15 percent.
   e. Perform ground fault test according to NETA ATS 7.14 "Ground Fault Protection Systems, Low-Voltage."

F. Tests and Inspections for Molded Case Circuit Breakers:
1. Visual and Mechanical Inspection:
   a. Verify that equipment nameplate data are as described in the Specifications and shown on the Drawings.
   b. Inspect physical and mechanical condition.
   c. Inspect anchorage, alignment, grounding, and clearances.
   d. Verify that the unit is clean.
   e. Operate the circuit breaker to ensure smooth operation.
   f. Inspect bolted electrical connections for high resistance using one of the two following methods:
      1) Use a low-resistance ohmmeter.
         a) Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from those of similar bolted connections by more than 50 percent of the lowest value.
      2) Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method in accordance with manufacturer's published data or NETA ATS Table 100.12.
         a) Bolt-torque levels shall be in accordance with manufacturer's published data. In the absence of manufacturer's published data, use NETA ATS Table 100.12.
   g. Inspect operating mechanism, contacts, and chutes in unsealed units.
   h. Perform adjustments for final protective device settings in accordance with the coordination study.
2. Electrical Tests:
   a. Perform resistance measurements through bolted connections with a low-resistance ohmmeter. Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from adjacent poles or similar switches by more than 50 percent of the lowest value.

b. Perform insulation-resistance tests for one minute on each pole, phase-to-phase and phase-to-ground with circuit breaker closed, and across each open pole. Apply voltage in accordance with manufacturer's published data. In the absence of manufacturer's published data, use Table 100.1 from the NETA ATS. Investigate values of insulation resistance less than those published in Table 100.1 or as recommended in manufacturer's published data.
c. Perform a contact/pole resistance test. Drop values shall not exceed the high level of the manufacturer's published data. If manufacturer's published data are not available, investigate values that deviate from adjacent poles or similar switches by more than 50 percent of the lowest value.
d. Perform insulation resistance tests on all control wiring with respect to ground. Applied potential shall be 500-V dc for 300-V rated cable and 1000-V dc for 600-V rated cable. Test duration shall be one minute. For units with solid state components, follow manufacturer's recommendation. Insulation resistance values shall be no less than two megohms.
e. Determine the following by primary current injection:
1) Long-time pickup and delay. Pickup values shall be as specified. Trip characteristics shall not exceed manufacturer's published time-current characteristic tolerance band, including adjustment factors.
2) Short-time pickup and delay. Short-time pickup values shall be as specified. Trip characteristics shall not exceed manufacturer's published time-current characteristic tolerance band, including adjustment factors.
3) Ground-fault pickup and time delay. Ground-fault pickup values shall be as specified. Trip characteristics shall not exceed manufacturer's published time-current characteristic tolerance band, including adjustment factors.
4) Instantaneous pickup. Instantaneous pickup values shall be as specified and within manufacturer's published tolerances.
f. Test functionality of the trip unit by means of primary current injection. Pickup values and trip characteristics shall be as specified and within manufacturer's published tolerances.
g. Perform minimum pickup voltage tests on shunt trip and close coils in accordance with manufacturer's published data. Minimum pickup voltage of the shunt trip and close coils shall be as indicated by manufacturer.
h. Verify correct operation of auxiliary features such as trip and pickup indicators; zone interlocking; electrical close and trip operation; trip-free, anti-pump function; and trip unit battery condition. Reset all trip logs and indicators. Investigate units that do not function as designed.
i. Verify operation of charging mechanism. Investigate units that do not function as designed.

3. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
4. Perform the following infrared scan tests and inspections and prepare reports:
a. Initial Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each enclosed switch and circuit breaker. Remove front panels so joints and connections are accessible to portable scanner.
b. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each enclosed switch and circuit breaker 11 months after date of Substantial Completion.
c. Instruments and Equipment: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
5. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.

G. Enclosed switches and circuit breakers will be considered defective if they do not pass tests and inspections.

H. Prepare test and inspection reports.
   1. Test procedures used.
   2. Include identification of each enclosed switch and circuit breaker tested and describe test results.
   3. List deficiencies detected, remedial action taken, and observations after remedial action.

3.7 ADJUSTING

A. Adjust moving parts and operable components to function smoothly, and lubricate as recommended by manufacturer.

B. Set field-adjustable circuit-breaker trip ranges as specified in Section 260573.16 "Coordination Studies."

END OF SECTION